AN EXPLORATION OF THE CONSTRUCT OF MASTERS LEVEL CLINICAL PRACTICE

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DECLARATION

I declare that the work in this thesis is my own and contains no material which has been published or used before in any context. The thesis has not been submitted for a degree at any other university.

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LIST OF ABBREVIATIONS

CPD	Continuing Professional Development
CSP	Chartered Society of Physiotherapy
CV	Coefficient of variation
DOH	Department of Health
EBP	Evidence Based Practice
HE	Higher Education
HEQC	Higher Education Quality Council
NCIHE	National Committee of Inquiry into Higher Education
NHS	National Health Service
QAA	Quality Assurance Agency for Higher Education
RCN	Royal College of Nursing
SD	Standard deviation
UK	United Kingdom
WCPT	World Confederation of Physical Therapy
WHO	World Health Organisation

ABSTRACT

This study aimed to explore the construct of Masters level clinical practice. A mixed methods approach converging quantitative and qualitative data was undertaken.

Consensus of behaviours indicative of the construct was explored through a quantitative Delphi study. Participants represented a total population sample of Masters course tutors in healthcare (n = 48). Round 1 requested behaviours indicative of the construct. Quantitative content analysis informed the behaviours explored in round 2, where participants rated their relative importance. Round 3 asked participants to rank the behaviours in order of importance. Descriptive and inferential analysis enabled interpretation of consensus.

The construct was also explored through an in-depth qualitative case study, using semi-structured interviews and participant observation. Purposive sampling selected the 'case' of a manipulative physiotherapy course and the participants for the study. Analytic categories were derived from the data using a constant comparative process until saturation of the data were achieved. Theoretical propositions to identify the components of the construct were developed.

The response rate for the Delphi study was very good (79.1%, 77.1% and 70.8% for rounds 1-3 respectively). Rounds 1 and 2 achieved good consensus enabling 21 agreed 'important' behaviours to be taken into round 3. The ranking process in round 3 afforded consensus overall, but also highlighted some differences between professions regarding the prioritisation of components of the construct. There was good convergence of the data with the case study, with clinical reasoning and knowledge identified as the most important components of the construct.

The study has identified generic components of the construct of Masters level clinical practice. In addition specific components and their prioritisation for the speciality of manipulative physiotherapy are identified. Development of this work by exploring several case studies to enable further consideration of professions and specialities through analytic generalisation would be beneficial.

1.   INTRODUCTION

Rapid developments in healthcare knowledge and technology over the past decade have contributed to a demand for healthcare professionals to develop expertise in managing more complex problems. Several developments have specifically contributed to the emphasis on Masters level courses as a means of developing this expertise. This has included the migration of healthcare professional courses into Higher Education (HE), the mandatory requirement for Continuing Professional Development (CPD) and the development of specialisation within clinical practice, with roles of 'clinical specialist', 'extended scope', and 'consultant' becoming commonplace. Central to the current proliferation of Masters courses is the emphasis on developing clinical expertise (Rushton, 2002).

Increased provision of academic opportunities have contributed to uncertainty surrounding the differentiation of academic level in relation to clinical practice in nursing (Davis and Burnard, 1992; Elkan and Robinson, 1995; James and Redfern, 1995; Gerrish et al, 2000), with Masters level frequently being equated with the role of clinical specialist (Whyte et al, 2000). These difficulties regarding level are mirrored in the wider educational literature (Winter, 1994; Higher Education Quality Council [HEQC], 1996). Although clarity has been provided through the framework for HE qualifications (Quality Assurance Agency for Higher Education [QAA], 2001a) for the academic aspects of an award, uncertainty still exists in relation to clinical practice. Educational practice needs to become 'evidence informed' (Davies, 1999), and to date few authors have explored the meaning of Masters level in practice.

A critical analysis of the literature facilitated through a conceptual framework of a soft systems methodology, identified a gap within the literature relating to Masters level clinical education (Rushton, 2000; 2001; Rushton and Lindsay, 2003). An exploration of this complex area was initially facilitated by a descriptive survey that explored the characteristics of existing courses for healthcare professionals that aimed to develop clinical expertise (Rushton, 2002; 2003). The survey highlighted many important issues of current practice, with a central feature being the articulation of the 'Masters levelness' of clinical practice. This study therefore aimed to explore the 'Masters levelness' of clinical practice, to provide insight into this so far elusive concept. 'Masters levelness' can be considered as a construct, which is a term originating from psychology to describe something that is not directly observable (Thorndike and Hagen, 1997). A construct was therefore developed to enable communication of its components and their subsequent exploration.

Masters level has been described as enabling students to apply knowledge, and develop an understanding of how boundaries are advanced through research. Students will also be able to manage complex issues systematically, with self-direction, creatively and with originality (QAA, 2001a). This definition predominantly reflects what can be considered as the 'academic component' of the construct that is generalisable across all Masters courses. Its equivalence therefore for the 'clinical component' of the construct merits consideration through issues of clinical expertise. This is particularly important with the current emphasis on developing clinical expertise through the political health agenda (Department of Health [DOH], 1999b; 2000a; 2000b).

2.   LITERATURE REVIEW

2.1   Scope of the Review

The review of the literature encompassed many aspects of theory in providing the detailed rationale and theoretical basis for this study. It primarily explored issues of expertise with an emphasis on knowledge and clinical reasoning that have been identified as the most important characteristics of expertise within healthcare. Other aspects of expertise from the wider literature are acknowledged as important, for example speed of activity, but were beyond the scope of this study. The literature was explored with specific reference to healthcare and to physiotherapy, the author's own profession and the profession used within the case study method. The scope of the existing literature was vast and therefore discrimination of the content for the review was defined closely to this study. It was therefore beyond the scope of the review to explore allied subject areas, including: competence, professionalisation, professional socialisation, decision theory, memory, artificial intelligence and expert systems. The review therefore shares a similar basis to most of the healthcare literature that uses cognitive theory as an exploration of expertise. The review also reflects the literature informing current practice that encompasses the past 30 years of research.

2.2   Context of Health

Clinical governance has been defined as:

".....a system through which National Health Service (NHS) organisations

are accountable for continuously improving the quality of their services

and safeguarding high standards of care by creating an environment in

which excellence in clinical care will flourish"

(Scally and Donaldson, 1998, p 61)

The World Health Organisation (WHO) usefully examines clinical governance

through its four components of: professional performance, resource use, risk

management and patient satisfaction (WHO, 1983). The component of

professional performance has subsequently been developed through key

initiatives within healthcare (DOH, 2000a; 2000b), and has contributed to the

emphasis on CPD and the development of clinical expertise, where staff in the

NHS receive support from employers to enable them to fulfil the professional

requirements of clinical governance and re-registration through the Health

Professions Council or equivalent body. The aim of 'Meeting the Challenge'

(DOH, 2000b) was also for CPD opportunities to become more strategic,

contributing to the current proliferation of educational opportunities.

The model of Evidence Based Practice (EBP) described by Bury (1998)

highlights the role of clinical expertise within healthcare to effectively set the

health context for this study (Figure 2.1). The model integrates expertise with

the best available evidence, to enable practitioners to formulate the best

decision for an individual patient within a patient-centred context of practice

(DOH, 2000a). This model also serves to highlight the complexities involved in

decision-making within clinical practice.

Figure 2.1: Model of evidence based practice, developed from Bury (1998)

Patient preferences

Best decision

Clinical expertise

Best available evidence
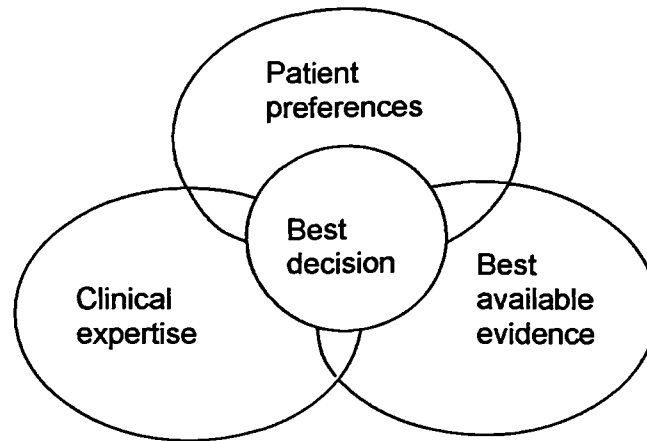
2.3   Context of Continuing Education

The origins of lifelong learning date back to the work of Dewey, Lindeman and Yeaxlee in the early 1900s (Jarvis, 1995), and it is acknowledged that a commitment to lifelong learning requires individuals to take responsibility for their own continuing education. The context of HE has changed considerably, developing from the elite, fulltime approach for the 18-21 age group of Robbins (Committee on Higher Education, 1963) to the current mass system that was identified by Dearing. The Dearing report (National Committee of Inquiry into Higher Education [NCIHE], 1997) represented a retrospective and prospective analysis of HE, identifying the concept of lifelong learning as a crucial outcome of education. Houle (1980) identified the need to continually prepare individuals for their 40 years of practice, rather than the initial approach of providing their education intensively for 3 to 5 years, and Frost (2001) also argues that there is no profession that would claim expertise based on professional education completed 5 or 10 years previously. This approach to continuing education has been advocated through professional bodies within healthcare, for example by the Chartered Society of Physiotherapy [CSP] (1983). Another key change in

the past 20 years has been the integration of CPD into processes of accountability within professional practice (Cervero, 2001). Roskell and Cross (2001) graphically defined continuing education as a skill continuum (Figure 2.2) illustrating the seamless provision of educational opportunity that also makes delineation of the different educational levels important.

Figure 2.2: A skill continuum for continuing education (adapted from Roskell and Cross, 2001)

Novice ⬜⬜ **Continuing education** ➤ **Expert**

Undergraduate ➤ Postgraduate ➤

CPD, Masters, Doctorate ➤
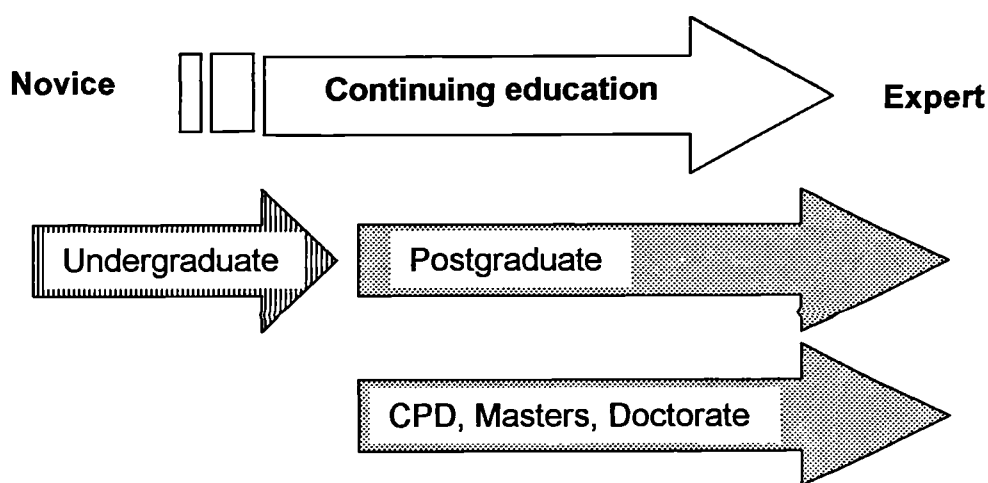
Barnett (1990) explored the concept of professional education within HE, lending support to the role of education in developing skills of critical analysis and reflection that can be applied within professional practice. The link to level of courses within HE however, remains elusive, and several authors have called for an evaluation of the role of Masters level education in developing professional roles (Gosling, 1999; Whyte et al, 2000). For nursing, Masters courses represented a shift in emphasis, as previously it had been espoused based on the work of Benner (1984), that extensive clinical practice was required to develop a nurse's clinical ability. This was accompanied by a wariness of academic practice that may draw a nurse away from the clinical

context (Hardy et al, 1984), a concern mirrored in physiotherapy (Gosling, 1999). The relevance of Masters level study to clinical practice was therefore questioned, with a perception that practitioners educated to Masters level were less able in the clinical context (Gosling, 1999). This perception was however balanced in Gosling's (1999) study against the need to raise awareness of the possible benefits of Masters level study.

The contexts of health and continuing education are synonymous with the 'interactional professional' model of professional socialisation proposed by Higgs and Hunt (1999) as a basis for clinical practice and expertise, reflecting generic skills of lifelong learning, research, reflective and autonomous practice, all enabling patient-centred practice.

2.4   Masters Level

2.4.1 Defining Masters level

The framework for HE qualifications (QAA, 2001a) describes students studying at Masters level demonstrating:

  ➤ Application of knowledge

  ➤ Understanding of how boundaries are advanced through research

  ➤ Management of complex problems systematically and creatively

  ➤ Originality in solving problems

These characteristics will be reflected in all Masters courses, as the framework is now used as the basis for curriculum design. The QAA (2001a) also recognises that students will develop the qualities required for working in

contexts requiring personal responsibility, initiative, and judgement in complex

and unpredictable professional environments. The emphasis of the QAA

descriptor for qualification at Masters level is on knowledge (Table 2.1).

Table 2.1: QAA descriptor for a qualification at Masters level (2001a, p.3)

Masters degrees are awarded to students who have demonstrated:

✓ a systematic understanding of knowledge, and a critical awareness of current and / or new insights, much of which is at, or informed by, the forefront of the discipline, field of study, or area of professional practice
✓ a comprehensive understanding of techniques applicable to their own research and advanced scholarship
✓ originality in the application of knowledge, together with a practical understanding how established techniques of research and enquiry are used to create and interpret knowledge in the discipline
✓ conceptual understanding that enables the student
    • to evaluate critically current research and advanced scholarship in the discipline
    • and to evaluate methodologies and develop critiques of them and, where appropriate to propose new hypotheses

Typically, holders of the qualification will be able to:
✓ Deal with complex issues both systematically and creatively, make sound judgements in the absence of complete data, and communicate their conclusions clearly to specialist and non-specialist audiences ✓ Demonstrate self-direction and originality in tackling and solving problems and act autonomously in planning and implementing tasks at a professional or equivalent level ✓ Continue to advance their knowledge and understanding, and to develop new skills at a high level
And will have:

The qualities and transferable skills necessary for employment requiring:
    • The exercise of initiative and personal responsibility
    • Decision-making in complex and unpredictable situations, and
    • The independent learning ability required for CPD

Although the descriptor is written to reflect the academic component of the

Masters level construct, its breadth encompasses many aspects of clinical

practice. In light of the current context of healthcare and the need for

practitioners to manage patients in a complex and changing environment, the

applicability of the descriptor to clinical practice appears insightful. The

descriptor is also synonymous with the requirements for specialist posts (for

example, CSP, 1995; World Confederation of Physical Therapy [WCPT], 1995),

and similarly to Whyte et al (2000) comparability of specialist practice to

Masters level can therefore be proposed.

Few studies have explored the characteristics of Masters level in healthcare.

Through a modified Delphi study, Davis and Burnard (1992) sought the

attributes of Masters level from ten Professors of Nursing in the United Kingdom

(UK). Their findings are summarised in Table 2.2, and are interesting, in

particular the tutor having the locus of control for learning that is in contrast to

the QAA's (2001a) emphasis on the student. Davis and Burnard (1992)

unfortunately did not follow the Delphi method in returning the attributes to the

Professors for further consideration, as it would have been interesting to see

how the attributes developed through subsequent rounds. They did however,

seek the same attributes from Dutch students on a Masters course and found

many differences (Table 2.2), although a comparison is problematic owing to

the different educational structures across the two countries and only one

course being studied. It is interesting to note the emphasis by the students on

clinical practice, although for both sets of data the emphasis was on the

application of academic skills to the clinical context, rather than the

development of clinical skills.

Gerrish et al (2000) explored Masters level practice through focus groups, informing in-depth interviews of 19 nurse educators involved in Masters level education. In identifying 'dilemmas', the findings of this study did highlight expectations of Masters level clinical practice (Table 2.2).

Table 2.2: Characteristics of Masters level from empirical studies in healthcare

| Component | Attributes of Masters level | | | |
	Davis and Burnard, 1992, (Professors)	Davis and Burnard, 1992, (Students)	Gerrish et al 2000 (Educators)	Whyte et al, 2000 (Students)
Knowledge	Narrow and deep. Specific		Deepening and broadening	
Research	Competence in research methods	Undertaking research. Implementing research in practice		Increased awareness
Locus of control of learning	Tutor			
Approach / attitude		Critical	Critical thinking	Critical / analytical
Clinical practice		Creative, based on specialist knowledge		Strategic approach. Increased confidence in assessing complex situations
Nature of practice		Independent. Teaching role	Development of role and change	
Educational processes			Facilitating creative thinking. Relevant to developing practice.	In depth approach to learning

Whyte et al (2000) explored the influences of completing a Masters course by nurses between 1989 and 1996. They found that teaching was the dominant career pathway taken by respondents (50%) with only 13% of respondents in clinical posts. The dates of the cohorts are however essential to analysing their findings, as this study was prior to the increasing pathways for clinical progression within the NHS (DOH, 2000a), and at a time when professional courses were becoming integrated into HE. The emphasis on teaching is therefore not surprising. In exploring the relevance of their course to clinical practice, the findings from the students are also detailed in Table 2.2. Although interesting, these findings must be interpreted with caution as only one institution was studied, but more importantly a significant number of non-responders (33.1%) were not followed up, so non-response bias may have influenced the findings. The attributes from these studies exploring healthcare courses highlight differences to the QAA (2001a) framework, to support further the rationale for this study and a focus on courses developing clinical expertise.

From their study, Davis and Burnard (1992) proposed a spiral model of professional development, describing how a nurse through continuing education moves through different stages and a continuous process of reflection. The concept of the spiral can therefore be used to develop the skill continuum model further (Figure 2.3).

Figure 2.3: Modified skill continuum for continuing education

NOVICE ——▶ Continuing education ————————————▶ EXPERT
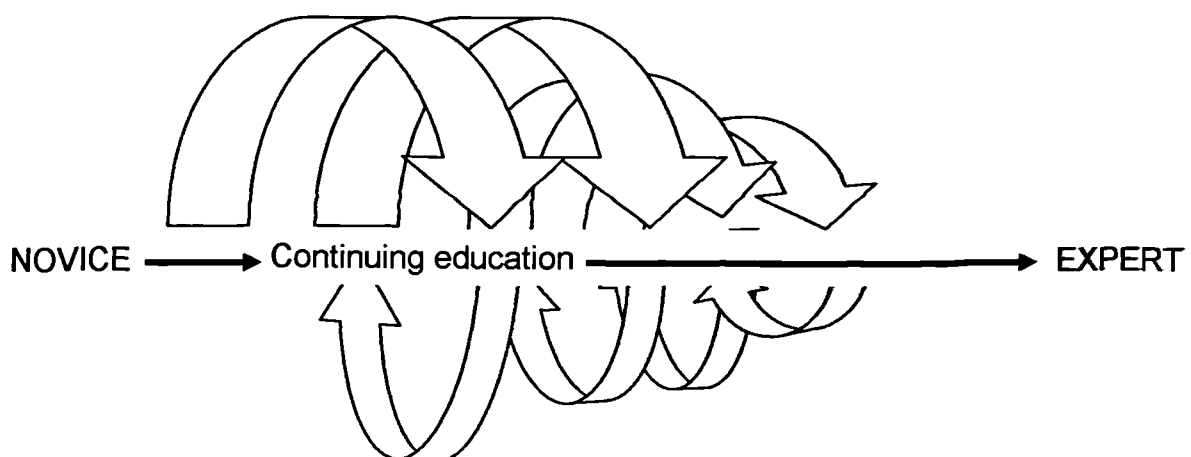
2.4.2 Standards in Masters level education

The proliferation of Masters courses has raised concerns over maintaining standards, as articulated in both the Harris (Higher Education Funding Council for England, 1996) and Dearing reports (NCIHE, 1997), although there is no empirical evidence of an actual decline in standards. Following these reports, Atkins and Redley (1998) were commissioned to examine the identification, description, and monitoring of standards across a stratified sample of 12 HE institutions, encompassing a total of 94 Masters courses. They found variation across the institutions regarding the explicit definition of levels, and no documentation of Masters level characteristics in some institutions. The one aspect where consensus was obtained across the participants was for the requirements of the students through the dissertation. This is a logical aspect to anticipate consensus as it is the common feature across all courses, while other aspects may vary considerably. The consensus may also suggest that it is an easier task to articulate the requirements of the dissertation activity.

2.5 Expertise

2.5.1 Definition of expertise

Interest in expertise is facilitated by the argument that understanding how experts think, what they know, and how they perform is essential to the development of a profession, particularly through the enabling of an individual's professional development (Benner et al, 1996; Ericsson, 1996). The definition of expertise has been recognised as a difficult exercise, and has been explored across professions (Delitto et al, 1989; Starkes, 1993; Coulon et al, 1996), being commonly articulated as the capacity to perform using cognitive and practical skills not employed by novices. These skills are applied to complex situations (Schon, 1983; Carter et al, 1987), the complex situations mirroring the QAA descriptor (2001a).

The literature highlights the problematic distinction between 'expert' and 'expertise' (Higgs and Titchen, 2001), as the terms are frequently used synonymously. 'Expert' tends to describe an individual and their role, and 'expertise' the characteristics of an expert's practice. Ericsson and Smith (1991 p 2) support this distinction in defining expertise as what distinguishes an expert from a novice. An expert therefore possesses a comprehensive array of the characteristics of expertise. In physiotherapy, Delitto et al (1989) defined an expert as a highly skilled or trained practitioner who was informed in their field. This definition is useful in that it highlights the important combination of knowledge and skills that is reflected throughout the scope of the existing literature. In contrast, Rew and Barrow (1987) described experts as

practitioners who if required, could make decisions on the basis of inadequate data, therefore using intuition. Definition of an expert therefore remains elusive and researchers have resorted to practical mechanisms for determining the expert participants for their studies. Criteria have included the peer nomination of experts and the use of years of experience or seniority, all of which are problematic as explored throughout this review. This fundamental difficulty therefore provides a limitation to most research within this area.

2.5.2 Evolution of research

It is possible to delineate the theory of expertise within healthcare into two 'generations' that illustrate a process of evolution (Jensen et al, 2000). The first generation was centred on the expert as an individual, possessing a range of reasoning strategies that were employed to solve problems. Central to this generation was the work of Elstein et al (1978) who explored problem-solving strategies within clinical practice, and subsequently the emphasis on hypothetico-deductive reasoning developed. The evolution of the second 'generation' (Jensen et al, 2000) was prompted by the increasing evidence from other disciplines suggesting that hypothetico-deductive reasoning was not the central issue in distinguishing practitioners with different levels of expertise (Elstein et al, 1990; Schmidt et al, 1990). Interest was therefore drawn towards exploring the role of domain specific knowledge, and the research of cognitive psychologists was embraced.

2.5.3 Characteristics of expertise

Most researchers have addressed the issue of expertise through the implicit concept of the continuum between novice and expert (Figure 2.3). Current work exploring skill development and expertise builds upon the pioneering work of de Groot (1965) who found that in chess, experts were superior to novices in their ability to select moves after only a brief glimpse at a chess board. There is however a major flaw in this analogy as experts in chess are identified by their success in tournaments, therefore with a clear performance measure of expertise (Paley, 1996) unlike for example, healthcare. However, the analogy has served to develop the literature within this area, and Rossano (2003) collates the subsequent work exploring skill development and expertise, to develop three principles (Table 2.3). For healthcare, this concept of deliberate practice can be paralleled to clinical practice. The authentic context of the practice facilitates the development of expertise, as professionals learn and develop knowledge (Schon, 1983). Some authors have proposed a relationship between this experience and expertise, but this point is contentious (Jensen et al, 1990; Ericsson et al, 1993; Starkes, 1993). In describing expert nurses, Benner (1984) contends that 5 years of context-dependent experience is required before a practitioner reaches a level of expertise. Support for this concept is afforded by Simon (1980), although he contends that 10 years is required to develop proficiency. Schon (1983) also agrees that experience is a prerequisite for expertise, but argues that experience is only one factor contributing to its development.

Table 2.3: Three principles of developing expertise

No	Principle	References
1	Expertise takes approximately 10 years of specific preparation. • Deliberate practice throughout this 10 years is required • Deliberate practice involves a continuous process of self-monitoring and critical self-evaluation and is always task related.	Chase and Simon, 1973; Simon, 1980 Rossano, 2003
2	The attainment of a level of skill is directly related to the amount of deliberate practice	e.g. Krampe and Ericsson's work with musicians, 1996
3	The quality and quantity of the deliberate practice becomes an important issue when the individual is working fulltime on the task.	Rossano, 2003

It is perhaps the word 'experience' and the synonymous use of 'clinical mileage' that is problematic, as often a passive process is implied. However, Benner (1984, p 36) did emphasise that experience is not just related to time but "the refinement of preconceived notions and theory through encounters with many actual practical situations that add nuances or shades of difference to theory", which is describing experiential learning (Kolb, 1984), emphasising Schon's 'reflection-on-action' (1983) as the process developing experience into knowledge. A commonly used definition of reflection is:

".... The process of internally examining and exploring an issue of concern, triggered by an experience, which creates and clarifies meaning in terms of self, and which results in a changed conceptual perspective"

(Boyd and Fales, 1983, p 100).

Evaluative and reflective use of experience is therefore essential to develop

along the continuum in Figure 2.3, providing support to the current emphasis on experiential learning for CPD and again the concept of a spiral model of developing expertise.

Benner has been pivotal in exploring the concept of expertise in healthcare. Benner's (1984) description of an expert in nursing described a practitioner who could understand a situation intuitively, effectively identified problems by avoiding the need to consider a wide range of alternatives, and then demonstrated action based on their understanding of the situation rather than using a set of rules. The acknowledged importance of this tacit / intuitive knowledge to expertise again emphasises the value of experiential learning (Davids and Myers, 1990). Benner (1984) describes five levels of nursing practice in moving from novice to expert practitioner (Table 2.4), based on the work of Dreyfus and Dreyfus (1986). The five levels are distinguished through the variation in cognitive processes and actual performance, synonymous with the knowledge and skills discussed in the definitions of expert and expertise.

Table 2.4: Benner's levels of practice

Stage	Level of practice
Stage 1	Novice
Stage 2	Advanced beginner
Stage 3	Competent
Stage 4	Proficient
Stage 5	Expert

A further development to this evolving theory was through acknowledgement of

Schon's concept of 'reflection-in-action' (Schon, 1983), where the process of

reflection occurs in practice at the time of the activity. It is a continuous process

of the construction and evaluation of theories using knowledge and can

therefore be described through Kolb's learning cycle, although Schon (1983)

emphasised its on-the-spot nature. Reflection-in-action is therefore intrinsically

linked to processes of clinical reasoning and the development of informal

theories, and Schon (1987) contended that educational programmes should

therefore focus on the development of a student's capability for reflection-in-

action.

The concept of reflection-in-action has however generated debate within the

literature, particularly centred on the issue of time. Time for self-awareness and

reflection is limited in many clinical situations, limiting the scope for this form of

activity. Eraut (1994) therefore argues that in these situations, reflection-in-

action is best considered as a metacognitive process, with fast interpretation of

information and resultant decision-making. Eraut (1994) is therefore describing

refection-on-action as the more considered process that would develop

expertise, through the active development of theory. However, in exploring the

characteristics of expert practice that are collated from empirical research

(Table 2.6, p 56), the concept of reflection-in-action is implicit to a number of

them. It is probably a combination of the two reflective processes therefore that

is useful to the expert practitioner.

In physics, Chi et al (1981) found that experts were more aware of their errors

and were committed to self-monitoring their practice, linking again to Schon's

(1983) two concepts of reflection, and the concept of metacognition which is the self-monitoring of one's thinking. The experts in Jensen et al's (2000) study demonstrated effective metacognitive skills, in contrast to Embrey et al (1996) who found that experts and novices demonstrated similar and frequent self-monitoring, that perhaps places emphasis on the quality of the self-monitoring / metacognitive processes occurring.

Carr and Kemmis (1986) defined the concept of developing theories through reflection-in-action as 'informal theory'. They highlighted the value of informal theory in guiding practice, as without this process, practice would be uncoordinated and random in nature or tightly bound by rules. Rolfe (1997) proposed that the use of informal theory and reflection-in-action contributes to a 'reflexive practitioner', a stage beyond the expert practitioner, concentrating on even the simplest task, and learning from every task. However this definition of a new level of practice is dependent on the acceptance of Benner's (1984) description of an expert linked to intuition, which Rolfe (1997) interprets as a level of automaticity and without thought. Automaticity, however, can encompass high level skills that are performed at a level where conscious monitoring is not required, enabling scope for other activities (Glaser, 1999), for example, reflection-in-action.

Several characteristics of expertise are explicit in the above discussion. The two consistent characteristics throughout the literature of knowledge and clinical reasoning will be explored in depth later, but others will be considered here. Carter et al (1987) evaluated teachers' plans for managing a class at short notice, and found that experts exceeded novices in the following areas, which

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are synonymous with Benner's (1984) evaluation of nurses:

- ✓ Recall of meaningful facts, features and patterns

- ✓ Higher level inferences from knowledge base

- ✓ Prioritisation of data

- ✓ Speed of accessing knowledge, and

- ✓ The organisation of information

Benner (1984) also described an expert's 'deep' understanding of a situation. Similarly, Berliner (1988) found that experts applied meanings to photographs of classrooms to a greater degree than novices, evaluating them for patterns and inconsistencies. In addition, Berliner found that experts could multitask by processing information concurrently from three sources, and that they had the ability to gain different types of information from a single source. Jasper's (1994) concept analysis of expert identified the four components of knowledge, experience, pattern recognition and recognition by others. Although similar to the issues identified above, this analysis was limited in its scope to nursing and therefore did not explore the literature more widely, commencing with Benner's model (1984) and framework.

Researchers exploring the characteristics of experts and novices have also demonstrated differences related to the individual's ability to synthesise knowledge and experience, to recognise the significance of critical cues, and to be able to prioritise what is important (Elstein et al, 1978; Larkin et al, 1980; Dreyfus and Dreyfus, 1986). Schmidt et al (1990) also found that expertise was specific to individual cases and therefore closely linked to a practitioner's background in that area, linking again to experience and knowledge.

2.5.4 Characteristics of expertise in physiotherapy

In physiotherapy, a number of qualitative studies (May and Dennis, 1991; Jensen et al, 1992; King and Bithell, 1998; Jensen et al, 2000; Doody and McAteer, 2002) afford insight into characteristics of expertise. Knowledge and clinical reasoning are explored later but two of the studies are discussed here. In a study of three experts and three novices in orthopaedic physiotherapy, Jensen et al (1992) identified the importance of the organisation of knowledge, and their control and management of a situation in distinguishing the expert. The management of a situation relates back to the reflection-in-action described by Schon (1983) with the practitioner constantly evaluating what they are doing and what they need to do. This was however a small data set in a defined clinical speciality and further work exploring these issues would be valuable, a point well recognised by the authors.

Through a grounded theory approach using case study analysis, Jensen et al (2000) identified four dimensions of expert practice in physiotherapy as knowledge and clinical reasoning (explored later), and movement and virtues. Evaluation of movement provided a framework for the assessment and management of patients, perhaps highlighting how the central concepts of a profession such as movement, inform an individual's model of expertise. This perhaps provides a rationale for differences between professions and merits further exploration. Virtues encompassed a commitment to learning, and a caring attitude towards patients. However, this study investigated practitioners from four specialities and any existing variations were not explored despite research suggesting differences (May and Dennis, 1991; Conway, 1998).

Jensen et al (2000) also found that reflection was an important component of practice for the experts. It was used actively to develop learning through their experiences and particularly therefore their personal knowledge, although the process of reflection was not explored relative to 'in-action' or 'on-action' concepts.

2.6   Knowledge

2.6.1 Forms of knowledge

The complexity of knowledge is often oversimplified by describing it as possessing two components of 'knowing that' and 'knowing how' (Williams, 1998). Eraut (1994, p 103) advocated use of the terms 'propositional, personal and process' knowledge as a means of addressing this oversimplification and the extensive use of varied terminology[1]. A key justification for the use of these forms of knowledge in the context of this study is the distinction of personal and process knowledge that is required to explore the existing evidence regarding expertise. The classification used here is therefore in contrast to the concept of 'professional craft knowledge', which is argued as encompassing aspects of Eraut's (1994) three forms of knowledge (Higgs and Andresen, 2001). Analysis of the literature emphasises different notions concerning knowledge relevant to this study, in particular: forms of knowledge, acquisition of knowledge, interactivity of forms of knowledge, and the context of using knowledge.

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[1] Discussion of the different forms of knowledge and the contrasting views of the different forms is beyond the scope of this analysis. The reader is referred to Eraut (1994) and Higgs and Titchen (2001).

Propositional knowledge as a form of knowledge is reflected throughout the literature (Higgs and Andresen, 2001), and encompasses that knowledge publicly available relating to discipline specific theories and concepts arising from sources of systematic knowledge, including research.

Eraut (1994) recognises process (procedural) knowledge as:

> "....knowing how to conduct the various processes that contribute to professional action. This includes knowing how to access and make good use of propositional knowledge" (p 107).

Process knowledge therefore encompasses clinical / psychomotor skills that are central to healthcare practice.

In contrast, personal knowledge is that knowledge acquired by the individual through experience, where experience and therefore experiential learning guide the development of knowledge (Eraut, 1994). Some personal knowledge develops into propositional / process knowledge, but it is the remaining personal knowledge that is distinct to the other forms of knowledge and its contribution to action that is poorly understood to date. In contrast to other classifications, personal knowledge is therefore justified as a separate form of knowledge. Eraut (1994) describes the remaining personal knowledge as 'impressions', that with further experience are refined, organised and transformed into other forms of knowledge. The impressions encompass information regarding experiences and cases, which are at different stages of development depending upon the degree of reflection and theorising that has occurred. Eraut (1994) links the varying degrees of development of personal knowledge to the learning intent. If intent to learn is present, then the knowledge is developed to a higher level, and

if not, it is left as an impression. Through clinical practice and experiential learning therefore, ongoing contributions are made to personal knowledge that is continuously refined.

The acquisition of knowledge is commonly distinguished as that learnt through formal teaching (e.g. a lecture) or that learnt through experience, reflecting experiential learning (Kolb, 1984). The emphasis of personal knowledge as reflected above is on knowledge acquisition through experiential learning, whereas the emphasis of propositional knowledge is usually on formal teaching and use of texts. In contrast, process knowledge can be acquired through both means, for example, a skill may be learnt formally in a classroom but adapted through experience. It has also been argued that propositions and therefore propositional knowledge can also be developed through experience (Titchen and Ersser, 2001). Eraut (1994) supports the acquisition of all forms of knowledge through experience, but develops the argument one stage further to contend also that some knowledge needs to be used in practice before it can develop any meaning for an individual.

Although the different forms of knowledge constituting a professional's domain specific knowledge appear distinct, in practice their boundaries are blurred and each informs the others, and can be transformed into the others (Higgs et al, 2001). Their use is reflected by concurrent use of the different forms of knowledge, emphasising their interactivity and interdependence (Figure 2.4). For example, personal knowledge will include propositional and process knowledge that is reviewed through the experience of using it in practice. New experiences in practice will therefore be constantly changing an individual's

knowledge. The evaluation and development of new knowledge is therefore important to professional development, and experts will constantly be learning, necessitating concurrent use of all forms of knowledge, that are integrated and utilised in a purposeful way.

Figure 2.4: Representation of different forms of knowledge
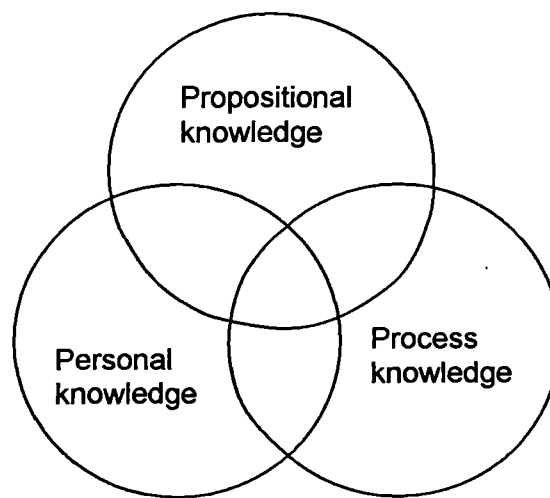
Eraut (1985) argued that use of knowledge is dependent upon context, describing academic, organisational and action contexts. He went on to argue that in an action context the practitioner is in a 'doing' situation and will use their personal knowledge more than their propositional knowledge (Eraut, 1994). Eraut's concept of an action context reflects the clinical environment for healthcare professionals. This dependence of knowledge upon context is also thought to facilitate intuitive functioning (Benner, 1984; Benner et al, 1996; Paley, 1996) and is what Polanyi (1962) defined as 'tacit' knowledge. Dreyfus and Dreyfus (1986) described tacit knowledge as the practitioner developing a 'feel' for the activity, so that they can do it without thinking, and its development has been described in two stages (Jarvis, 1992). Firstly professionals 'forget'

the rules that guided practice from their undergraduate education and their knowledge is transformed into knowledge that is individual, difficult to express, and linked to action (Cervero, 1988). Secondly, professionals monitor and evaluate their own practice to inform the subsequent development of this knowledge. The concept of intuition as defining expert practice (Benner, 1984) has however been questioned (English, 1993; Paley, 1996), with arguments centred on novices also using intuition.

2.6.2 Organisation of knowledge

In the absence of knowledge it is recognised that reasoning skills are limited in their value. Effective practitioners require a sound background knowledge that is relevant to the clinical area and organised into meaningful patterns (Norman, 1990). It has been suggested that cognitive structure is applied through knowledge that is connected to specific conditions (Glaser and Chi, 1988). The assumption is that the organisation of knowledge stored from past experiences, enables retrieval and comparison to current cases. Expertise is therefore thought to be related to the structure of subject specific domain knowledge that is stored in long-term memory (Anderson, 1987; Eysenck and Keane, 1990).

Clarity of what is meant by the organisation of knowledge is however still elusive, despite researchers in a variety of disciplines attempting to represent the cognitive structures of concepts (Olsen and Biolsi, 1991), with early studies describing 'chunking'. The concept of the chunking of knowledge has been extensively researched in cognitive psychology illustrated by Chase and Simon's (1973) studies in chess, where they observed chunking as bursts of

activity reflected in a meaningful string of moves. The complexity characterised

by the experts reflected a greater number of moves within the 'chunk'. In

medicine, several proposals have developed regarding the organisation of

knowledge (Table 2.5), and their scope highlights the complexities of the

cognitive ability and chunking. However one limitation of extrapolating the

proposals is the focus of the studies on patient diagnosis, reflecting one aspect

of practice. This therefore limits generalisation to other healthcare professions

where the emphasis may be on management rather than diagnosis, although

the findings provide a useful basis for understanding and future research.

Exploring the literature related to errors of diagnosis also informs this argument

as several studies have demonstrated that errors are not as a consequence of

inadequate knowledge, but due to the inability to retrieve knowledge stored in

memory (Bordage and Zacks, 1984; Bordage and Lemieux, 1991).

Table 2.5: Proposals regarding the organisation of knowledge from empirical

studies in medicine

Proposal	Reference
Networks with nodes and connections	McGaghie et al, 1996
Hierarchy, with general concepts above specific scripts above specific instances at the base	Schmidt et al, 1990
Collections of semantic axes (linear and vertical analysis)	Bordage, 1994
Symptom by disease matrix	Papa and Elieson, 1993; Papa et al, 1996
Propositions with causal links (network of rules to link propositions)	Patel et al, 1986
Individual case examples	Norman et al, 1996

It has been argued that central to this organisation of knowledge is the understanding developed through the use of propositional knowledge (Chi et al, 1981; Feltovich and Barrows, 1984; Lesgold et al, 1988). This idea is supported through the theoretical work of Jones (1992) who contends that knowledge is used through the assistance of principles or rules. However, other authors have challenged this perspective and suggested that personal knowledge is more important (Patel and Groen, 1986; Schmidt et al, 1990; Eraut, 1994) with rules superseded through the development of knowledge (Jarvis, 1992), and reliance on propositional knowledge characterising the reasoning of novices.

These opposing perspectives are each supported by empirical research. For example Patel and Groen (1986) found that expert cardiologists provided less extensive pathophysiological explanations compared to novice students, while Lesgold et al (1988), in two studies of residents and expert radiologists found that the biomedical knowledge used by experts was more precise and applied in greater detail. However, a limitation of this research is the low number of participants in expert and novice groups, the definition of expert not being comparable between studies, the opposing perspectives being supported by two contrasting groups of researchers, and the reliance on think aloud or post hoc procedures. The retrospective think aloud procedure is inherently isolated from the ongoing decision-making that occurs in everyday practice, a criticism supported by the move away from think aloud accounts by key researchers (Elstein, 2000). The think aloud protocol does however attempt to access ongoing reasoning, which methodologically may be preferable to reflections on a case through a post hoc methodology. However, Boshuizen and Schmidt (1992) found that the methodology did not influence the findings and their

results supported the greater emphasis on personal knowledge. Taking into account the empirical findings and the limitations of the studies, in agreement with Eraut (1994) there appears to be some support for the use of propositional knowledge reducing and the use of personal knowledge increasing as expertise develops. Several possible explanations have been proposed that emphasise the interactivity of the different forms of knowledge, for example propositional knowledge becoming encapsulated in personal knowledge and applied in a tacit manner (Boshuizen and Schmidt, 1992), with this developing automaticity affording greater capacity for attention to other issues.

The medical literature has provided considerable evidence that 'expert' practitioners often do not agree with one another (McGaghie et al, 1994; Wolf et al, 1994, Hatala et al, 1996), supporting Benner et al's observations (1996) that experts have different possible ways of managing a situation. This suggests that organisation of knowledge is not consistent across experts within a particular area, for example McGaghie et al (1994) found more variation in anaethesiologists' data compared to general internists when exploring concepts of pulmonary physiology. Their study was however limited by use of a new method for exploring knowledge structure based upon an assumption of a particular proposal of organisation, and the use of small convenience samples that were then analysed using inferential analysis.

2.6.3 Organisation of knowledge in other professions and specialities

The concept of domain specific knowledge is difficult to research, and this probably explains the lack of literature addressing the organisation of

knowledge in other healthcare professions. Benner (1984) argued that nurse experts manage complex problems by using a body of personal knowledge that is constituted by a range of similar situations encountered previously, and this emphasis on the value of personal knowledge is clear across the professions (Rolfe, 1997; Higgs and Titchen, 2001), and supported by Jensen et al's (2000) study, where the patient was the key source of knowledge to the physiotherapist. The patient as a source of knowledge introduces the variability of their cognitive ability and values systems that will therefore influence a practitioner's personal knowledge.

Reischman and Yarandi (2002) concluded that experts in nursing cognitively structure problems differently to novices. However, this conclusion was based on the recognition of highly relevant (HRC) and total number of cues (TC) for patient diagnosis, with the key assumption that the index of HRC/TC is an indicator of effective processing. The results are therefore interesting but need to be followed up with further research. The authors also observed that two of the four case presentations appeared easier for the experts, and felt that the easier two were characterised by more distinctive patterns, perhaps enabling easier access to domain specific knowledge. However, it may also relate to previous exposure to that case presentation (Schmidt et al, 1990; Brooks et al, 1991), linking to pattern recognition (Section 2.7.4).

In occupational therapy, Robertson (1996) found that experts possessed well-developed schemata of previous clinical experience. Their organisation of knowledge enabled reasonable predictions to be made confidently, in contrast to the novices who were struggling with a lack of domain specific knowledge

and understanding of their clinical environment. However the experts in this study were practitioners with no further detail provided and the novices were 2nd and 3rd year undergraduate students, limiting comparison and generalisation of the findings. Similarly to Jensen et al (1992), the researchers also found that the practitioner's representation of a problem was patient-centred, in contrast to the students who gained the patient's perspective but were unable to integrate it within the 'whole'. This finding characterises the practitioners at Benner's (1984) stage of 'advanced beginner' where the practitioner is able to relate to the patient as an individual. Some authors (Dreyfus and Dreyfus, 1986; Robertson, 1996) have explained these difficulties through a deficit of personal knowledge regarding the situation. There are however other possible explanations, with the predominance of a medical model within healthcare consciously, and perhaps now subconsciously contributing to an emphasis on biomedical issues as opposed to the patient's perspective.

In contrast to the above emphasis on personal knowledge, Jensen et al (1992) also recognised experts as possessing more process knowledge, as they knew when they needed to gather further information and knew how to go about it in a selective manner, therefore linking the concept of expertise to process knowledge. This is supported by the work of Cervero (1988) who contended that an expert's propositional knowledge remains static, compared to their dynamic process knowledge that is transformational, and by Chi et al (1981) who found experts' schemata characterised by process knowledge. In reality however, experts have probably developed all forms of knowledge (Jasper, 1994), and its integration and organisation, with greatest emphasis on personal and then process knowledge as explored above (Figure 2.5).

<u>Figure 2.5: Representation of use of the different forms of knowledge in an</u>

<u>expert healthcare practitioner</u>
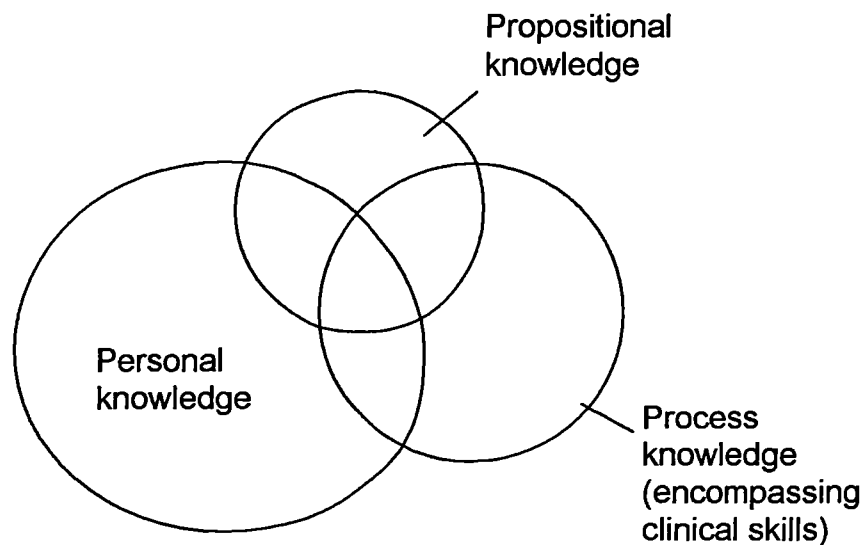
2.6.4 <u>Conclusions regarding knowledge</u>

The organisation of knowledge, encompassing its acquisition and retrieval, is

therefore justified as the central feature of expertise (Table 2.6) in a synthesis of

the existing empirical evidence. The value placed upon knowledge also links

effectively to Masters level. Gerrish et al (2000) had identified the importance of

developing the scope of knowledge in addressing depth and breadth, in

assisting the organisation of existing knowledge and the establishment of links

to new knowledge through the patterns that exist. There is some contention

therefore to the QAA's (1998), and Davis and Burnard's (1992) emphasis on

depth from the Professors, through a narrow, research informed deepening of

knowledge at Masters level, and it is interesting that the narrow focus on

knowledge did not carry through into the final level descriptor (QAA, 2001a).

2.7 Clinical Reasoning

2.7.1 Background

The descriptions of clinical reasoning and problem solving are used synonymously within the literature to describe processes that have similar stages. For the purposes of this review, the term clinical reasoning has been used throughout to reflect the current terminology in healthcare (Higgs and Jones, 2000; Rushton, 2002). Clinical reasoning is defined as the cognitive processes used in the assessment and management of patients (Jones, 1992). The origin of the literature exploring clinical reasoning is again from medicine, and based on the past 30 years of research a clear understanding of aspects of the process have developed. This literature has subsequently been elaborated into research exploring other healthcare professions. It is therefore prudent to commence with an analysis of clinical reasoning in medicine.

2.7.2 Clinical reasoning in medicine

The emphasis of the research in clinical reasoning has predominantly focused on the issue of diagnosis. The initial research was focused on 'clinical reasoning skills' that could be used in any clinical situation (Norman, 2000). However, as the research evolved, and in particular practitioners demonstrated poor generalisability from one problem to another (Shulman et al, 1978), it became clear that knowledge was the key component to reasoning (Ericsson and Smith, 1991) and the initial concept of a skill of clinical reasoning was unfounded.

2.7.3 Diagnostic reasoning

Diagnostic reasoning is one component of clinical reasoning, although it has received greatest attention in the literature to date. Diagnosis has been defined as a central feature of medical reasoning, and has arguably become increasingly important for other healthcare professions with the changing NHS culture and the increased emphasis on autonomous practice (DOH, 2000a). Cognitive theories have positioned medical diagnosis as a process of reasoning, with the representation of the problem, the practitioner's internal model of the problem as the central feature (Feltovich and Barrows, 1984). This representation has been described as an 'illness script', enabling organisation of all of the information (Schmidt et al, 1990).

From the outset, diagnostic reasoning has been observed as a process of hypothesis testing, a hypothetico-deductive process. Diagnostic problems were resolved through the early generation of hypotheses. Each formed hypothesis is linked to further clinical findings that would be present if it follows through to be the correct hypothesis, and this then guides the collection of further data (Elstein et al, 1978). Cue acquisition and hypothesis generation were identified as important components, and through research they were identified as common to all practitioners. Elstein's et al's (1978) model was completed with the stages of cue interpretation and hypothesis evaluation. Hypothesis formation is central to overcoming limitations of memory capacity, as this enables narrowing of the area of memory searched for a solution. The quality of the hypotheses are consequently central to the correct diagnosis and management plan (Norman et al, 1982). It has been observed therefore that

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expert practitioners form initial hypotheses earlier than novices, and the quality of their hypotheses is superior (Elstein and Schwarz, 2002).

2.7.4 Pattern recognition

Research subsequently demonstrated that experts do not always use hypothetico-deductive processes in situations that are familiar (Schmidt et al, 1990; Brooks et al, 1991). Through the framework of the diagnostic model of reasoning, a process of pattern recognition was proposed. The concept of pattern recognition was first introduced into the expertise literature through the studies in chess (de Groot, 1965; Chase and Simon, 1973), and was subsequently adopted into medicine, as experts were observed recalling knowledge through a pattern that was thought to increase the size of the 'chunks' stored in memory (Simon and Gilmartin, 1973). Hypothetico-deductive reasoning was subsequently seen as used by experts for unfamiliar or complex cases, otherwise pattern recognition was used (Patel and Groen, 1986).

Pattern recognition is also described as categorisation, as a patient case is assigned by the practitioner to a category (Elstein and Schwarz, 2002). This process of assignment has been described as occurring in different ways. Firstly, through a matching process that categorises a case according to its similarity to previous cases (Schmidt et al, 1990; Brooks et al, 1991). Further support to this model is afforded by Norman et al (1996) who found that the process of diagnosis is also influenced by context, for example the position of a skin rash on the body. However all of this work is from the same group of researchers and it is therefore logical that their work should be supportive in

setting out to explore similar research questions. Secondly, other authors have observed clinical experience enabling the development of mental models or prototypes (Rosch and Mervis, 1975; Bordage and Zacks, 1984). Support for this proposal is provided through the ability of experts to recognise the findings that would complete a clinical picture, suggesting a complex network of links between possible diagnoses and clinical features (Lemieux and Bordage, 1992). Although there are different proposals for how the process operates, there is consensus that pattern recognition exists within medicine, and this process lends further support to the emphasis on the organisation of knowledge and the role of personal knowledge in particular in experts.

Research investigating visual pattern recognition skills in medicine has suggested that greater experience reflected by exposure to prior examples, develops the ability to utilise pattern recognition to identify typical cases / illness scripts (Schmidt et al, 1990; Norman et al, 1996). A role for experience of specific presentations is also advocated by Regehr et al (1994), who found that pattern recognition assisted accurate diagnosis, and was not affected by deliberate manipulation of data as was hypothetico-deductive processing. However, in following through the arguments regarding the organisation of knowledge, illness scripts can be developed differently by practitioners depending upon their experiences with patients. Therefore, for the same disease, Schmidt et al (1990) argued that practitioners might have different scripts. This variation is also to be expected as every patient presents differently, highlighting the complexity of clinical reasoning in healthcare. Again, the role of reflective and evaluative practice to inform the development of such scripts is important.

2.7.5 Clinical reasoning across professions and specialities

Generalisation of the medical work on clinical reasoning to other healthcare professions is problematic as the emphasis has been on diagnostic reasoning, in contrast to other healthcare professions where the greater emphasis may be on management (Roberts, 1996). However, it has also been argued that the issue of diagnosis is central to models of clinical reasoning for all healthcare professions (Higgs and Jones, 2000), hence the justification for the emphasis of the literature within this review, and in practice it may be the actual term 'diagnosis' that is problematic and the medical connotations that it implies.

There is some empirical evidence from several professions to support adoption of this research to provide the basis for further investigation. For example, in nursing it has been demonstrated that nurses use hypothetico-deductive processes during diagnosis (Gordon, 1980; Tanner et al, 1987). Tanner et al (1987) found early generation of hypotheses and Gordon (1980) observed a relationship between cue quality and the order of testing hypotheses. However, these studies represent preliminary work in this area that requires further consideration.

2.7.6 Clinical reasoning in physiotherapy

In physiotherapy, there has been increasing attention within the literature to clinical reasoning. However, the majority of the literature is theoretical in nature based upon the findings from medicine, with little empirical research. Payton (1985) investigated 10 physiotherapy experts across a variety of specialist areas using a simulated retrospective recall approach, and found similar

reasoning processes to physicians using a hypothetico-deductive approach. In particular the physiotherapists commenced the formulation of hypotheses early in the patient history. This study justified the subsequent adoption of the medical research into physiotherapy, explaining why in physiotherapy clinical reasoning is dominated by the hypothetico-deductive model (Higgs, 1990; 1992; Jones, 1992; Higgs and Jones, 2000). This domination is also reflected in undergraduate education, where the model has been used as the basis for practice for > 12 years (anecdotal experience). However, the pattern recognition model is also facilitated throughout undergraduate education through emphasis on cases and consideration of clinical syndromes / patterns. In contrast to medicine, researchers have proposed use of the hypothetico-deductive model in patient management (Jones, 1992), although to date there is minimal empirical support (Doody and McAteer, 2002). However, Mattingly (1991) also emphasised the importance of the management stage, and Roberts (1996) documented reasoning processes centred on management, both in occupational therapy.

Thomas-Edding (1987) provided further support for the hypothetico-deductive approach in findings from videotaping experienced physiotherapists and students as they examined 'actors'. Their findings reflected greater use by the experienced group of the hypothetico-deductive method, suggesting differences to the medical literature. The findings of the study were however limited by the definition of the expert group as > 3 years of clinical experience post qualification.

Rivett (1995) in contrast, demonstrated that both expert and novice

physiotherapists developed hypotheses early in the process of patient examination. Rivett and Higgs (1997) subsequently demonstrated use of hypothetico-deductive processes by physiotherapists, but with no differences between expert and novice groups. They suggested that their results would have been clearer had their novice group been students, although their expert group did have a minimum of 5 years experience following specialist postgraduate education. These studies all use low numbers from a limited sampling frame and are also limited by the undergraduate educational experience, as the novice groups will probably have been taught the hypothetico-deductive model as the basis for practice. Jensen et al's (1990) finding of the effortless integration of current information to previous cases, illustrating pattern recognition for experienced practitioners prior to much of the published research is therefore interesting.

King and Bithell (1998) employed structured interviews of 5 musculoskeletal specialist and 5 generalist physiotherapists. The study found a clear distinction between the specialists and generalists on all aspects of Glaser and Chi's (1988) characteristics (see Table 2.6), with specialists exhibiting the documented characteristics of expert practice and pattern recognition. This study however has multiple limitations and its findings should be interpreted with caution. The questioning of participants essentially biased the findings through a framework of Glaser and Chi's (1988) characteristics, and therefore strong conclusions cannot be developed. In addition the delineation of the two groups was problematic. There were clear criteria for the specialist group, centred on membership of a Clinical Interest Group (total years of experience of group was 60 years, mean 12 years). However the generalist group had a

greater total and mean age of experience (total 82 years, mean 16 years), making it difficult to compare these findings to previous studies where the generalist group would have been considered as experts. In practice, the useful difference between the groups was the formal education of the specialist group, that may have influenced the finding of pattern recognition in particular, as teaching pattern recognition and an emphasis on clinical patterns through syndromes is an approach taken by the courses leading to membership of the Clinical Interest Group (anecdotal experience).

Case et al (2000) also found differences between the reasoning of experts and novices in cardio-respiratory physiotherapy. Their findings suggested that experts used a more holistic approach to patient care and were more consistent in their analysis of a 'paper case'. However the implications of the study are limited owing to several methodological limitations relating to the definition of expert and novice practitioners, and the imposition of a hypothetico-deductive process in a study that was exploring clinical reasoning. In another qualitative study, Doody and McAteer (2002) observed cyclical processes of reasoning using hypothetico-deductive and pattern recognition strategies in expert physiotherapists. Their findings suggested that the processes of the novices (students) were similar to the experts except that they did not demonstrate pattern recognition, errors of reasoning were evident, and treatment was often developed from unexplored hypotheses. The findings of this study are however limited by the participants all assessing different patients, and therefore variation in difficulty of the case may have affected the reasoning processes. These findings highlight a characteristic of expertise not considered in depth within this review, as the effectiveness of the expert in comparison to the novice

with fewer errors of the hypothetico-deductive processes being observed. Efficiency of the hypothetico-deductive processes is therefore a key characteristic of expertise and is reflected in other characteristics collated in Table 2.6 (p 56), for example in the quality of the hypotheses formed (Norman et al, 1996).

The research in physiotherapy has therefore supported the medical literature. In contrast, other professions have described different models of reasoning, for example, a phenomenological process in occupational therapy (Mattingly, 1991). However, consideration of other models is beyond the scope of this analysis. The reader is referred to Mattingly and Fleming (1994) and Higgs and Jones (2000).

Some work has specifically explored the differences that exist between different areas of speciality. In a large study of peer nominated experts, May and Dennis (1991) found that orthopaedic physiotherapists gathered all of the relevant data from the assessment before making any decisions regarding the patient. In contrast they found that neurological physiotherapists were more active throughout the collection of data as they identified cues and patterns to then inform further data collection. Their reasoning approaches were therefore very different suggesting that reasoning needs to be explored across speciality. Perhaps practitioners employ different cognitive approaches for different clinical presentations? Certainly the domain specific knowledge as explored earlier will be different, but perhaps also the reasoning strategy? Further exploration of different models of clinical reasoning and speciality may therefore assist our understanding further.

2.8   Specialisation

2.8.1   The concept of specialisation

The concept of specialisation within medicine is usually credited to Noyes who

135 years ago documented that as medical knowledge grew, Doctors were

required to specialise (Donaghy and Gosling, 1999). It has however, been more

recently that other healthcare professions have addressed this issue.

Specialisation is problematic through arguments that the articulation of

'profession' is paramount to sustain notions of specialisation, and several

authors have contended that healthcare professions are not at that stage, for

example Heater (1992) in discussing occupational therapy. In physiotherapy,

the Australian Physiotherapy Association put forward a motion to the General

Meeting of the WCPT in 1978, asking for the international body to recognise the

need for specialisation and to develop guidelines for Member Organisations

(Watts, 1978). Subsequently, guidelines for specialisation were approved by the

international body in 1982. Australia was the first Member Organisation to

develop a model of specialisation that through a complex process of theoretical

and clinical examination leads to the award of fellowship specialist practitioner,

with the first fellowship being awarded in 1983 (Carr and Shepherd, 1996). In

the UK, the development of specialist and extended scope roles was partly

driven by the decision to reduce junior doctors' hours (DOH, 1991). The CSP

(1995) produced a guidance paper for developing the clinical specialist role.

This paper, along with the NHS grading structure, did not formally recognise the

role of clinical specialist, although it did acknowledge the specialist as an

example of an advanced practitioner along with extended scope and consultant

roles. To date within the UK, it is only the consultant therapist role that is formally recognised for physiotherapy (DOH, 1999a).

2.8.2 Expertise and specialisation

Some authors have seen expertise as equivalent to specialisation (Fenton, 1992), however tensions exist. As the discussion above highlighted, the definition of an expert is difficult, and in particular using the length of time that a practitioner has practised to inform consideration of expertise and also specialist is problematic (Jasper, 1994). Donaghy and Gosling (1999) argue that expert and specialist are different. Using the WCPT definitions (1995), they contend that a specialist will be an expert but that an expert is not necessarily a specialist. However, the authors are implicitly relating specialist practitioner to level of expert.

Schon (1983) highlighted potential difficulties through recognition that specialisation contributes to a narrowed focus of a practitioner, and may therefore as a consequence work against a holistic approach. In light of the previous discussion on knowledge, this contention of narrowing suggests that a narrowing of domain specific knowledge occurs with specialisation, and this is perhaps the nature of Donaghy and Gosling's (1999) articulation of the difference between specialist and expert, where the narrowing does not necessarily occur. In practice this narrowing would probably be accompanied by an increased depth of knowledge, reflecting changes in the organisation of knowledge. This narrowing is therefore reflected in Figure 2.3 (p 22) as the cyclical process of continuing education narrows to enable depth and

organisation rather than breadth with time, although it is acknowledged that the degree of narrowing will vary according to a practitioner's role.

2.8.3 Linking specialisation and academic level

The issue of academic level and clinical expertise is receiving increasing attention. In defining the Clinical Nurse Specialist in the United States, the American Nurses Association requires study at Masters or PhD level (Raja-Jones, 2002). Within the UK, the Royal College of Nursing (RCN) required a nurse to study to first degree level (RCN, 1997). This was further supported by the United Kingdom Central Council for Nursing, Midwifery and Health Visiting (1995) having defined BSc as the minimum level for specialist practitioner qualifications. Consultant level in the UK has been defined at Masters or Doctoral level (DOH, 1999b). Another informing development for physiotherapy is that in the United States licence to practice is currently at Masters level and moving to Clinical Doctorate, and Canada is moving to Masters level for 2010 (Ryan et al, 2003). Donaghy and Gosling (1999) propose an outcome based model of defining specialists for the future, and argue that this approach should focus on advanced programmes of study, highlighting clinically based Masters degrees as the main example, therefore implicitly relating specialist practice with Masters level. Maybe in years to come this comparison will become explicit, and perhaps also link to expert practice as explored previously. Certainly through consideration of a Masters course that is clinically based and aiming to develop clinical expertise, Masters level, specialist practice, and expert practice can be argued as comparable.

2.9   Rationale for this study

As the above review of the literature illustrates, exploration of the concept of expertise possesses great value in providing an understanding and a developmental framework for others (Roskell and Cross, 2001). The findings from the empirical research exploring expertise are summarised (Table 2.6) in perceived order of importance through the empirical literature. The existing literature assists in informing further developments but it possesses many limitations as highlighted throughout the review that limit its generalisability, in particular across specialities and professions. Although support for the characteristics in Table 2.6 is provided, they must be interpreted with some caution. Recognising these limitations, the support for the organisation of knowledge and use of pattern recognition as a reasoning process are distinct. From the characteristics detailed, the intricate links between reasoning strategies and knowledge are again highlighted. Experts therefore demonstrate flexibility in their solving of problems with the ability to move between different reasoning processes, according to the difficulty of a particular presentation. The difficulty of the presentation is itself influenced by the individual's experience and knowledge, again supporting the organisation of knowledge as the key feature of expertise. Many of the detailed characteristics also contribute to a high level of effectiveness for experts compared to novices.

Table 2.6 Collated characteristics of expertise as supported by empirical evidence

Characteristics of experts	Empirical evidence
i. Organisation of knowledge	Chi et al, 1981; Benner, 1984; Feltovich and Barrows, 1984; Patel et al, 1986; Patel and Groen, 1986; Anderson, 1987; Lesgold et al, 1988; Eysenck and Keane, 1990; Norman, 1990; Schmidt et al, 1990; Jensen et al, 1992; Papa and Elieson, 1993; Bordage, 1994; McGaghie et al, 1996; Papa et al, 1996; Jensen et al, 2000
ii. Pattern recognition as a reasoning strategy in straightforward cases	Rosch and Mervis, 1975; Patel and Groen, 1986; Jensen et al, 1990; Schmidt et al, 1990; Brooks et al, 1991; Jensen et al, 1992; Lemieux and Bordage, 1992; Bordage and Zacks, 1984; Regehr et al, 1994; Norman et al, 1996; King and Bithell, 1998; Jensen et al, 2000; Doody and McAteer, 2002; Elstein and Schwartz, 2002;
iii. Experience / deliberate practice	Chase and Simon, 1973; Simon, 1980; Benner, 1984; Schmidt et al, 1990; Ericsson et al, 1993 and other studies, particular in sport and music.
iv. Speed of cognitive activity	De Groot, 1965; Chase and Simon, 1973; Benner, 1984; Carter et al, 1987; Groen and Patel, 1988; Schmidt et al, 1990
v. Ability to move between different reasoning approaches	Schmidt et al, 1990; Brooks et al, 1991; Norman et al, 1992; Rivett and Higgs, 1997; Doody and McAteer, 2002
vi. Prioritisation of data	Elstein et al, 1978; Larkin et al, 1980; Benner, 1984; Dreyfus and Dreyfus, 1986; Carter et al, 1987
vii. Early formation of hypotheses for hypothetico-deductive process	Elstein et al, 1978, Payton, 1985; Tanner et al, 1987; Rivett, 1995; Elstein and Schwartz, 2002
viii. Patient-centred approach	Benner, 1984; Jensen et al, 1992; Robertson, 1996; Case et al, 2000, Jensen et al, 2000
ix. Synthesise propositional and personal knowledge	Elstein et al, 1978; Larkin et al, 1980; Dreyfus and Dreyfus, 1986; Elstein et al, 1990
x. Emphasis on personal knowledge	Benner, 1984; Patel and Groen, 1986; Boshuizen and Schmidt, 1992; Eraut, 1994; Reischman and Yarandi, 2002
xi. Reflection-in-action	Schon, 1983; Carr and Kemmis, 1986; Glaser and Chi, 1988; Jensen et al, 2000
xii. Reflection-on-action	Schon, 1983; Eraut, 1994; Jensen et al, 2000
xiii. Recognition of significant or critical cues	Elstein et al, 1978; Larkin et al, 1980; Dreyfus and Dreyfus, 1986

xiv. Deep understanding of a situation	Benner, 1984; Berliner, 1988; Glaser and Chi, 1988
xv. Intuition	Benner, 1984; Dreyfus and Dreyfus, 1986; Benner et al, 1996
xvi. Emphasis on process knowledge	Chi et al, 1981; Cervero, 1988; Jensen et al, 1992
xvii. Type and number of cues utilised for hypothetico-deductive process	Anderson, 1987; Schmidt et al, 1990
xviii. Higher level inferences from knowledge base	Benner, 1984; Carter et al, 1987
xix. Self-awareness / metacognition	Glaser and Chi, 1988; Jensen et al, 2000
xx. Holding up to five working hypotheses at a time for hypothetico-deductive process	Elstein et al, 1978
xxi. Excel mainly in own domains	Glaser and Chi, 1988
xxii. Perceive large meaningful patterns	Glaser and Chi, 1988
xxiii. Superior short and long term memory	Glaser and Chi, 1988
xxiv. Spend time analysing a problem qualitatively	Glaser and Chi, 1988
xxv. Quality of hypotheses formed	Norman et al, 1982
xxvi. Commitment to continuing education	Jensen et al, 2000
xxvii. Greater time spent analysing the problem, although arrive at a solution faster than novices	Chi et al, 1988
xxviii. Ability to multitask	Berliner, 1988
xxix. Higher level of gathering information	Berliner, 1988
xxx. High level of control and management of environment	Jensen et al, 1992

In exploring the implicit link between Masters level and expert practice further,

Table 2.6 represents an important contrast to the characteristics of Masters

level collated through the few empirical studies that have explored this issue for

healthcare courses (Table 2.2). In particular, a contrast is apparent for

knowledge in comparing the considerable evidence explored above, with only two of the four studies defining knowledge as a component, and none considering clinical reasoning processes.

It has been highlighted that key components of the development of clinical expertise are deliberate practice and an authentic context (Cope et al, 2000), in other words, clinical practice. Fox-Young (1995) therefore argues that the assessment of experts within a profession is dependent upon the ability to observe and assess clinical practice. The construct of Masters level clinical practice is therefore the implicit basis for assessment of the practice component of Masters courses that aim to develop clinical expertise. Assessment of a pass at Masters level is therefore used to agree that the behaviours of an individual are consistent with those expected for Masters level.

From the literature review, the construct of Masters level clinical practice can be proposed as comprising two components:

- Academic component - that distinguishes Masters level from Undergraduate level and Doctoral level
- Clinical component - that can be considered as distinguishing between expertise and competence in clinical practice

Although it can be argued that this is an artificial separation that by the very nature of clinical practice is problematic, it is a useful distinction to facilitate an exploration of the construct. The distinction enables an analysis of the new component of Masters level clinical practice in addition to the development of the existing Masters level academic component, where some consensus already exists (Atkins and Redley, 1998; QAA, 2001a). Inherent within this

study was therefore an exploration of this proposed distinction of two components.

Donaghy and Gosling (1999) suggest that the development of generic standards that describe advanced level practice across all specialities within a profession would be useful. One aspect that Donaghy and Gosling (1999) do not consider however, is the development of generic standards across all healthcare professions which is a key consideration for this study, and supported by the generic framework for qualifications (QAA, 2001a). An exploration at Masters level enables this comparison to be made, as in theory the Masters level aspect is the same across all professions and courses. This study will therefore contribute to the development of a construct that can then be used as a set of items for the assessment process of Masters level clinical practice in healthcare, in defining standards of practice and supporting development of the construct for a specific purpose (Kerlinger and Lee, 2000). This will enable construct validation through consideration of issues of 'convergence' in combining evidence from different sources, and 'discrimination' in differentiating the construct from similar constructs (Kerlinger and Lee, 2000). It will also enable evaluation of its measurement validity, providing justification for its development as an assessment tool in measuring specific attributes (Dembo, 1994).

3   METHODOLOGY

3.1   Methodological perspective

The link between research and theoretical perspective is important to all inquiries, and encompasses philosophical tradition, its position regarding claims on knowledge, and methodology. A detailed analysis of the issues linking research and theoretical perspective is beyond the scope of this study, but the perspective for this study is considered below.

3.1.1   Philosophical tradition

Reid (1993) and Shepard et al (1993) describe two philosophical traditions of phenomenology and positivism, suggesting that between the extremes of each there exist many research questions that benefit from interpretation by both traditions. This study was essentially framed within the philosophical tradition of phenomenology, which encompasses a range of perspectives underpinning the qualitative paradigm. Phenomenology views the real world as that experienced by individuals and recognises the importance of individual understanding to enable interpretation (Shepard et al, 1993). Phenomenology disputes the single objective reality proposed by positivists to recognise multiple realities, and relative rather than absolute reality (Sim and Wright, 2000). Another central concept of phenomenology is recognising that phenomena are context specific; highlighting that research therefore needs to fully understand the context. To enable this understanding the phenomenological tradition also recognises the need for the researcher to develop a rapport both emotionally and cognitively

with the people being studied, therefore rejecting the positivistic demands for high objectivity and detachment from the researcher (Sim and Wright, 2000).

As highlighted above, the possibility of research being informed from both philosophies to differing degrees is emphasised (Reid, 1993; Shepard et al, 1993), facilitating this author to explore her positivistic origins in research within physiotherapy through experimental studies at the extreme of the positivistic tradition. There are aspects of these origins that are acknowledged in decisions made throughout this study, moving the study away from the extreme of the phenomenology tradition. Recognition of a philosophical stance enables consideration of position regarding claims on knowledge, methodology, and subsequently method.

3.1.2 Position regarding claims on knowledge

This research is predominantly an example of theory building research that follows an inductive process of deriving statements from findings to facilitate the development of a theoretical framework of understanding (Sim and Wright, 2000). Although a mixed methods approach is adopted, greater emphasis is placed on qualitative approaches. This is very appropriate for this study as there is minimal literature in the area being investigated and therefore the theory in existence is limited. The theoretical starting point for this research has been defined from the review of the literature, and this has enabled formulation of the research questions, conceptual framework, and the decisions within the methodology section.

The position of this study regarding its claims on knowledge is derived from pragmatism. The origins of pragmatism lie in the work of Dewey, Mead, James and Pierce (Cherryholmes, 1992). Central tenets of this position include knowledge arising from action and situations, concern with applications and solutions to a problem, and the problem being the most important issue (Cresswell, 2003). This is in contrast to the methods being important, and highlights the feature that researchers from a position of pragmatism will subsequently use all methods to understand a problem. Recent authors have highlighted the importance of this focus on the research problem, and then using several methods to derive the knowledge regarding the problem (Patton, 1990; Tashakkori and Teddlie, 1998; Barbour 1999). In synthesising the knowledge claims for this position of pragmatism, Creswell (2003, p 12) details the following key features:

✓ Not committed to one philosophy or reality

✓ Each researcher has freedom of choice regarding methods and techniques

✓ The world is not viewed as an absolute unity

✓ What works at the time is truth

✓ Researchers focus on the 'what' and 'how'

✓ Recognition of research occurring in a wide range of contexts

As can be seen from these knowledge claims, mixed methods are welcomed by pragmatist researchers. This is also consonant with phenomenology as a philosophical stance, as there is considerable overlap between phenomenology and the knowledge claims detailed above, although again this position moves the study away from the extreme of phenomenology. It has been argued

(Sandelowski, 2000) that mixed method studies are therefore operationalised at the level of data collection and analysis, and that the philosophical stance is reflected in the selection of methods, their combination, and their analysis. This argument therefore lends further support to the position of pragmatism.

3.1.3 Methodology

A non-experimental methodology was used for this study as manipulation of variables was not appropriate. A mixed methods approach was adopted, although it has been acknowledged that despite considerable interest in this approach, there is limited literature to support the design and analysis of mixed methods research (Sandelowski, 2000).

3.2   Mixed Methods Approach

The artificial divisions between quantitative and qualitative research into positivist / structural approaches, and interpretive approaches is not a useful analysis (Pope and Mays, 2000a), as it tends to create adversarial positions for researchers. This is now formally acknowledged within sociology in particular as being confusing (Hammersley, 1992), and within healthcare mixed methods are now being acknowledged as valuable (Barbour, 1999). So, in the same way that Reid (1993) and Shepard et al (1993) argue that research lies on a continuum between phenomenology and positivism as a philosophical stance, it is therefore increasingly recognised that all research lies on a continuum between quantitative and qualitative methods (Creswell, 2003).

The origins of mixing different methods is usually credited to Campbell and Fiske who, in 1959 used mixed methods to research the validity of psychological traits, and triangulation across methods was developed (Creswell, 2003). This current study is an example of a mixed methods approach that utilises *concurrent* procedures (Creswell, 2003), using the *convergence of* quantitative and qualitative data to facilitate a comprehensive investigation of the research question. The concurrent procedures are characterised by the collection of quantitative and qualitative data concurrently to integrate them into the overall analysis and interpretation of findings.

A central assumption of this study is therefore that the collection of different forms of data would best facilitate a way of addressing the research question. This assumption is supported by the work of Holsti (1969) who argued that moving continuously between quantitative and qualitative methods is essential to enable the researcher to gain insight into the meaning of the data. In this study the qualitative data provide a different perspective to the construct of Masters level clinical practice revealed through the quantitative data, that may or may not support the findings or may suggest that reinterpretation of the data is necessitated. It was therefore anticipated that interpretation of the qualitative data would further assist understanding of the quantitative aspects and vice versa. A possible limitation in the rationale for the choice of a mixed methods approach must however be acknowledged. The researcher's own background professionally centres on the positivistic philosophy and the use of experimental methodologies to explore problems. The researcher's comfort with this approach therefore inherently contributes to the assumptions made and the decision regarding a mixed approach.

3.3 Conceptual Framework

A conceptual framework encompasses the key features and relationships between them (Robson, 1993). The conceptual framework for this study was informed by the literature review and two previous studies undertaken for the Doctorate: firstly through a critical analysis of the literature relating to clinical education (Rushton, 2000; 2001; Rushton and Lindsay, 2003), and secondly through the descriptive survey of current practice in Masters courses developing clinical expertise for healthcare professionals (Rushton, 2002; 2003).

Figure 3.1: Conceptual framework for the study
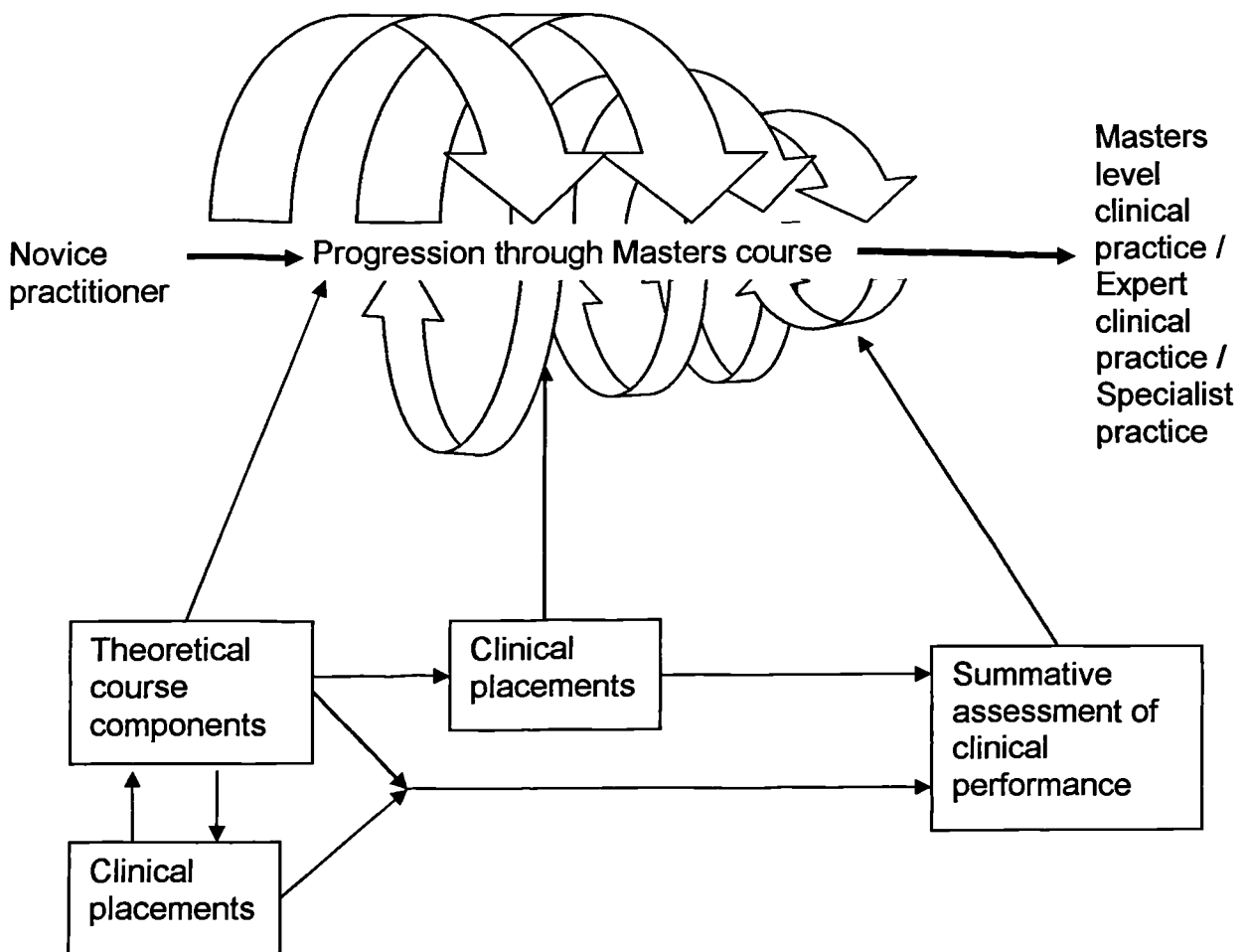
This process of development facilitated a descriptive conceptual framework for this study that was integrated with the existing theory in support of this area (Miles and Huberman, 1994) as highlighted by the literature review. The concurrent processes of this study also contributed to the ongoing development of the conceptual framework. Although the framework is modified continually through the processes of data collection and analysis, the starting point of the framework is illustrated in Figure 3.1. The conceptual framework illustrates the two possible structures of a course either integrating theory and placement throughout or a theory followed by placement model (Rushton, 2002; 2003).

3.4   Research questions

There has been minimal attention in the literature regarding research questions for mixed methods approaches, but it has been acknowledged that a mixed methods study necessitates two research questions (Creswell, 1999), and for a concurrent procedure both questions are required at the commencement of the study. The informing components to this research (Rushton, 2000; 2001; 2002; 2003; Rushton and Lindsay, 2003) contributed to a focused area for exploration of the construct of Masters level clinical practice. However, with little existing research in this area, a wide descriptive research question was necessitated for the quantitative study:

> *What are the agreed behaviours that are indicative of the construct of Masters level clinical practice?*

A subsidiary research question was also explored:

Are the agreed behaviours common across the healthcare

professions?

For the qualitative study a wide exploratory question was required:

What are the behaviours that characterise Masters level clinical

practice within the clinical environment?

3.5 Quantitative Delphi study

3.5.1 Design

This study was descriptive in nature, and the stages within it were

characteristically sequential with little overlap between them. It is an example of

a consultative design within a non-experimental methodology (Reid, 1993).

3.5.2 Method

The Delphi approach was used to define a domain of content for the construct

of Masters level clinical practice through national consensus. The Delphi

method has been described as a 'method for the systematic collection and

aggregation of informed judgements from a group of experts on specific

questions or issues' (Reid, 1993, p 131). It is an example of a consensus

method that was developed in the 1950s by the Rand Corporation as a tool to

facilitate decision-making in defence policy (Sim and Wright, 2000). The Delphi

method aimed to maximise the benefits of using an informed panel to consider

the construct, while at the same time minimising the disadvantages recognised in collective decision-making (Jones and Hunter, 2000).

The Delphi approach provided anonymity to avoid any dominance of a particular member within a group or conference consensus technique (Jones and Hunter, 2000). It used an iterative process of 'rounds' which provided the opportunity for individuals to alter or develop their opinions as part of the process. It also provided controlled feedback to participants and permitted statistical analysis of the group response providing greater information than a statement of consensus (Pill, 1971; Rowe et al, 1991). The key stages of the Delphi method as applied to this study are described in Figure 3.2. For this study three rounds were used, and this was dependent on the data and the achieved consensus throughout. It may have been necessary to continue further rounds, although further rounds can be problematic through forcing consensus and losing the number of participants (Whitman, 1990; Binkley et al, 1993; Williams and Webb, 1994; Cross, 2001). Use of the Delphi in this study can be described as a 'modified' Delphi as it contrasted to other studies through an explicit emphasis of a different purpose to each round, rather than the sole focus being the modification of existing ideas through extensive feedback.

The data collected are essentially quantitative although it has been argued that some aspects of qualitative data can be explored, for example in asking for reasons behind the ranking of statements (Jones and Hunter, 2000), and the initial analysis of the emerging themes. Although qualitative data can usefully be collected, a major limitation of this method is the inability of the data to withstand inductive methods of analysis (Green et al, 1999). Essentially the

argument centres on the inability to remain close to the participants' initial statements throughout the stages of the process.

Figure 3.2:   Key stages of the Delphi method

```
┌─────────────────────────────────┐        ┌──────────────┐
│ Initial behaviours gained from panel │    │  Round 1     │
│ of experts                      │        └──────────────┘
└─────────────────────────────────┘
                 │
                 ▼
┌─────────────────────────────────┐
│ Responses aggregated and analysed │
│ to identify a degree of consensus │
└─────────────────────────────────┘
                 │
                 ▼
┌─────────────────────────────────┐        ┌──────────────┐
│ Panel members reconsider their   │        │  Round 2     │
│ views and rate the importance of each │   └──────────────┘
│ behaviour on a scale of 1 - 5    │
└─────────────────────────────────┘
                 │
                 ▼
┌─────────────────────────────────┐
│ Responses aggregated and analysed │
│ to identify a degree of consensus │
└─────────────────────────────────┘
                 │
                 ▼
┌─────────────────────────────────┐        ┌──────────────┐
│ Aggregated responses sent to the │       │  Round 3     │
│ panel for rank ordering of the   │        └──────────────┘
│ behaviours                       │
└─────────────────────────────────┘
                 │
                 ▼
┌─────────────────────────────────┐
│ Exploration to see if consensus was │
│ reached                          │
└─────────────────────────────────┘
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As with all methods, there are advantages and disadvantages of the Delphi method. Advantages include: anonymity of the participants, inhibition of the effects of interpersonal contact on the data, participants having time to

contemplate their decisions, and the process of measurement being responsive to emerging perspectives as it continues (Sim and Wright, 2000). It is also cost effective to the researcher in terms of time and other resources. In addition, Sackman (1975) describes the tendency of convergence towards agreement as a key advantage.

In contrast, disadvantages of the Delphi approach include: anonymity possibly engendering a lack of accountability for decisions made, and the process of reaching decisions not being accessible to the researcher (Jones and Hunter, 2000). There is also the potential of dropout of participants across the study (Williams and Webb, 1994), although the use of experts with an interest in the area being studied limited this. Conducting a number of rounds can also be time consuming (Sim and Wright, 2000).

Justification for this method can be developed from the above advantages and the existing literature. Group decision-making as a means of obtaining data possesses considerable potential for this study in seeking consensus on the development of the construct, with the additional benefit of the group encompassing those directly involved in using it. In reviewing studies that have compared methods of group decision-making it was found that formal methods were preferable to informal (Murphy et al, 1998a), but conflicting evidence exists. Some studies demonstrated no evidence that Delphi or meeting based methods are best (Pill, 1971; Gerth and Smith, 1991), although others suggest that the Delphi method is slightly inferior to meeting based methods (Sackman, 1975; Rowe et al, 1991). Sackman (1975) argues that the Delphi method forces consensus and its conclusions are limited as it does not permit participants to

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discuss opinions, while Murphy et al (1998a) argue that the Delphi method can usefully encourage participants to conform to the norm of the group. In contrast, other authors argue that these criticisms reflect poor use of Delphi rather than limitations of the method (Reid, 1993), and this is reflected throughout the existing literature with poor description of method and analysis commonplace. Delphi permits access to larger groups that meetings would inhibit, and it prevents influence on the data of possible destructive group dynamics (Williams and Webb, 1994). It has also been argued that the components identified in a Delphi have high face validity, where an expert panel from the 'real world' provides confirmation of information (Cross, 1999). In addition, if consensus is achieved, there is evidence of concurrent validity as the participants have both identified and agreed components (Williams and Webb, 1994).

3.5.3 Sample for the Delphi study

Participants are commonly referred to as 'experts' (Cross, 1999) and in the present study were selected for their expertise of developing and assessing Masters level clinical practice, although as explored in the literature review the problematic definition of 'expert' provides a potential for bias in the sample. The participants were the course tutors of courses running in the 2002/3 academic year at Masters level aiming to develop a student's clinical expertise. The sample was narrowed further to those courses that encompass the direct assessment of clinical practice through a clinical placement and its assessment process. This is supported by the analysis of the construct being implicitly used as the basis for assessment as discussed in the literature review.

A total population sample (Oppenheim, 1992) was used, affording good external validity and was based on the resulting sample for the descriptive survey (Rushton, 2002; 2003), although the literature does not demand representativeness for the analysis of a Delphi study (Powell, 2003). The inclusion criteria for courses in the survey included BSc as the entry point into the profession to standardise the postgraduate educational structure, and a similar basis of practice combining reasoning and clinical skills to enable comparison between professions. The professions of nursing, midwifery and health visiting, occupational therapy, physiotherapy, podiatry, radiography and speech and language therapy were consequently included. The descriptive survey (Rushton, 2002; 2003) identified 51 courses that employed clinical placements, all of which used a summative assessment of student clinical performance as part of the process. These 51 courses were used as the basis for the sample. Additionally, new advertisements for courses for the 2002/3 academic year and searching websites informed awareness of the existence of any new courses fulfilling these criteria since the previous study. The resulting sample was constituted as follows (Figure 3.3).

<u>Figure 3.3: Sample of participants contributing to the Delphi study[2]</u>

51 courses identified from Rushton (2002) ←	Physiotherapy 12 Nursing 6 Radiography 29 Interprofessional 4

<u>Analysis of the courses</u>

Physiotherapy
2 courses managed by same course tutor
1 course not running in 2002/3 academic year
No new courses identified
Nursing
No new courses identified
Radiography
2 course tutors were managing two courses each
No new courses identified
Interprofessional
2 courses no longer running
3 new courses identified

Total population sample of 48 course tutors

<u>Participants</u>

Physiotherapy
All course tutors able to participate
Nursing
1 course tutor experienced a close bereavement and so felt unable to participate
2 course tutors unable to participate due to time commitments at work
Radiography
6 course tutors unable to participate due to time commitments at work
Interprofessional
1 Course Tutor unable to participate due to time commitments at work

38 participants for Delphi study ←	Physiotherapy 10 Nursing 3 Radiography 21 Interprofessional 4

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[2] Interprofessional courses admitted students from different professional backgrounds

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3.5.4 Procedure

The following procedure ensured that all components of the study were efficient and effective:

> ➤ An email / telephone call to each participant was made inviting their participation in the study by email or post, and providing the participant information sheet (Appendix 8.1).

> ➤ The majority of participants had contributed to previous research (Rushton, 2002; 2003), and were therefore motivated to be involved.

> ➤ Informed consent was assumed through the decision of participants to return the questionnaire.

> ➤ All factors known to increase the response rate to questionnaires were used (Oppenheim, 1992), for example: professional presentation of questionnaire, and maintaining short length to a maximum of 2 sides A4.

> ➤ For each round, reminders were sent out after 3 weeks by email / post.

> ➤ For each round at 6 weeks post distribution, the non-respondents were followed up by email / post.

3.5.4.1 Round 1

It was originally planned that the initial topics sent to the panel would be derived from the descriptive survey (Rushton, 2002), therefore having originated from the panel members themselves (Sumsion, 1998; Jones and Hunter, 2000). Round 1 in this study would therefore have enabled participants to see each other's responses and validate their own responses, as well as identifying any missing data (Bork, 1993). However, owing to the changes to the sample

between the descriptive survey and this study it was not felt that the initial topics would be reflective of all participants, which is a pivotal component of the Delphi process. It was therefore decided that the first round would gain this information afresh from all study participants. Round 1 therefore asked for behaviours indicative of the construct of Masters level clinical practice (Appendices 8.2; 8.3). A list of 10 behaviours was requested to ensure that the participants separated their responses into particular behaviours characteristic of the construct, rather than providing an overall description. Round 1 also asked open questions requesting information on the ease of the task, and provided the opportunity for any further comments. The open questions therefore afforded some insight into the decision-making of participants.

3.5.4.2   Round 2

Feedback in the form of the aggregated responses from round 1 was sent to the participants with the round 2 questionnaire (Appendices 8.4; 8.5).

In measuring attitudes, elements that intend to quantify a particular entity or variable are known as scales (Sim and Wright, 2000). A 9-point Likert scale to enable ranking has been agreed as a useful tool for the Delphi method (Jones and Hunter, 2000). However, it can be argued that a 9-point scale is problematic in that the attitudes are separated across the 9 items, perhaps artificially. In turn this would lead to low numbers for each item and therefore limit possible analysis, particularly when the sample is fairly small. A 9-point scale would therefore not aid precision, and a 5-point scale is agreed within the literature as most commonly used (Sim and Wright, 2000), with the reliability of

Likert scales tending to be good (Oppenheim, 1992). Attitudes were therefore measured by obtaining the participants' ratings of importance of the behaviours on a 1 - 5 Likert scale.

Open questions were also included based on the analysis of the findings from round 1, and are therefore explored later (Section 4.1.1.5)

3.5.4.3 Round 3

Feedback on round 2 was provided. Round 3 explored the ranking of the importance of the listed behaviours (Appendices 8.6; 8.7). Ranking provides a numerical value to a judgement, in this case the importance of the behaviour. To interpret the rankings a set of assumptions are made about the equality of the intervals on the scale (Oppenheim, 1992), justifying it as interval level. There is added validity to using the ranking process on the behaviours for this study as the behaviours have originated from the participants themselves. This is in contrast to the key criticism of this form of analysis where the components being ranked invariably can mean different things to different people at different times (Oppenheim, 1992). Ranking can also be problematic as participants may be forced to express a hierarchy in their preferences for some behaviours that they do not feel (Converse and Presser, 1994). Participants have also been documented as finding it difficult to rank items in the middle of the order (Sudman and Bradburn, 1982), and these points were considered in the analysis. The issue of ranking was also assisted through use of open questions to explore decision-making, as a means of exploring reliability and validity. Use of an expert panel also assisted the reliability and validity as all participants

had the same frame of reference, and as course tutors were familiar with the construct being explored owing to their involvement in its assessment. Twenty one is also a problematic number of behaviours to be ranked with Oppenheim (1992) finding that raters are unable to make discriminations across more than 10 points for a rating scale. However, ranking 20 items has been used successfully elsewhere (Roskell and Cross, 2001). The rationale for the 21 items will be explored later (Section 4.1.2.8).

Participants were instructed not to give tied rankings both in the covering letter and on the top of the questionnaire. Open questions were also included based on the analysis of the findings from round 2. A decision was made to stop the Delphi at this stage, which will be explored later (Section 4.1.3.7).

3.5.5 Data Analysis

Walker and Selfe (1996) suggest 70% as an acceptable return rate for postal questionnaires, in contrast to other authors describing > 70% as very good (Babbie, 1990; Mangione, 1998) , although the evidence to support this figure is lacking as is the literature exploring this issue. All data must be interpreted in the context of the panel composition (Jones and Hunter, 2000), and this issue is reflected throughout the results section.

3.5.5.1 Issue of consensus

There are two components to the evaluation of agreement. The first component explores the extent of 'agreement' of an individual participant with the statement

being considered. The second component affords the 'consensus' element to

agreement in exploring the extent of agreement between respondents (Jones

and Hunter, 2000). An important question however, is whether there should be

consensus? Defining consensus is therefore not necessarily a key aim of using

Delphi, as identifying a lack of consensus can be equally important, highlighting

aspects / issues meriting further exploration (Adelson and Aroni, 1975). The

definition of consensus is an aspect of the Delphi approach that has been

described as problematic in the literature (Williams and Webb, 1994), with

studies frequently not articulating how consensus was evaluated. This study set

consensus for some aspects of the data prior to commencement, but other

aspects were decided following analysis of the data, allowing the data to

'decide' consensus and interpreting the decision of consensus as a conceptual

issue, justified by the limited literature to inform this decision (Williams and

Webb, 1994).

3.5.5.2   Round 1

Content analysis of the data provided the basis of initial feedback to participants

(Reid, 1993). Themes were identified within the behaviours provided by the

participants. The group of responses under a resulting statement of behaviour

were the same as or closely reflected that behaviour. The number of responses

within each behaviour was then counted. Those behaviours with a frequency of

mention ≥ 2 were taken into round 2, to exclude behaviours provided by only

one participant. The assumption was that the frequency with which the

behaviour is mentioned is significant, although this is a questionable

assumption that is rooted within positivistic origins. However it is argued as

appropriate in this context based upon the group of experts defined as the sample for the Delphi study that reflects a total population sample of course tutors within the UK. It can therefore be justified that the frequency of which they consider something important has relevance. In addition, it was beyond the scope of round 2 to include all behaviours mentioned by every participant, as there would have been too many items to expect participants to consider. This was therefore a quantitative approach to content analysis as distinct to the qualitative approach explored later.

The resulting behaviours were supported by independent analysis of the data by an independent researcher who was unconnected to the study, but who had a similar educational and research background to the researcher to ensure reliability and validity. The data were collated and forwarded to the independent researcher who used the same processes of data analysis as the researcher to obtain conclusions. The two sets of findings were then explored collaboratively to ascertain levels of agreement. The independent observer documented her overall comments on the findings.

The open questions used in round 1 were analysed through the development of analytical categories and theoretical propositions as described in Section 3.6.5.

Consensus

The establishment of a percentage level for the inclusion of items / consensus has been commonly used in Delphi studies, although the percentage level has varied considerably, ranging from 55 – 100% for later rounds (Powell, 2003).

Consensus for initial behaviours was established as good for those provided by

> 50% participants, and very good for those provided by > 60%. The exact

figures selected cannot be justified beyond appearing reasonable as suggested

by the use of an open question to collect the data from round 1. The decision-

making is therefore acknowledged as a possible limitation of the study.

3.5.5.3   Round 2

Agreement with the behaviours

Strictly speaking the Likert scale was an ordinal scale, however if assumptions

are made regarding the equality of the intervals between the points of the scale,

it has been argued that it can be used as an interval scale (Kerlinger and Lee,

2000) and this is common practice. The assumption of equality of intervals is

not problematic in this study in contributing to error and distortion (Kerlinger and

Lee, 2000) as non parametric analysis was used throughout. Agreement with

the behaviours was therefore illustrated through use of the mean and standard

deviation (SD) to enable more sensitive analysis, and the median and mode.

The mean, median and mode are all measures of location (Reid, 1993). The

mean is the sum of all of the scores divided by the number of cases, while the

median / 50th percentile is the central value when the data are ordered, and the

mode is the most frequently occurring score. In contrast, the SD provides

information on the spread of values / variability around the mean (Sim and

Wright, 2000). A key criticism of a Likert scale is its problematic reproducibility

in that the same total score for a behaviour could be obtained in a multitude of

ways (Sim and Wright, 2000). It has therefore been argued that the total score

has little meaning and supports emphasis on the analysis of the pattern of responses as described above, rather than the total score.

Consensus

The analysis encompassed the use of means, SDs and the coefficient of variation (CV) for evaluating consensus agreement. Use of the CV enabled comparison across the behaviours as it describes variation relative to the mean (Sim and Wright, 2000), converting the SD to a form independent of the measurement units, representing a % of variation. It is calculated using the following formula:

$$CV = [SD \div Mean] \times 100 \qquad \text{(Sim and Wright, 2000, p 182)}$$

The level of consensus was established following the analysis of the data, and was informed by one existing study that attempted to provide a basis for decision-making when using interval level data. Murphy (1983, cited Duffield, 1993) identified a score of 4 on a Likert scale of 1 to 5 as the minimal requirement for consensus. However, although logical this decision was still arbitrary and open to bias.

Consensus between all participants was evaluated using Kendall's coefficient of concordance (W) (Cross, 1999; Sim and Wright, 2000), investigating the hypotheses of:

H1   There is agreement between all participants on the ratings of the behaviours

H0   There is no agreement between all participants on the ratings of the behaviours

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Kendall's W evaluates the average agreement in ranks between > 2 sets of ratings, on a scale of 0 – 1. Although the data has been justified at interval level, it does not however provide information about the actual agreement in scores (Sim and Wright, 2000).

Consensus between the participants of the radiography group and between the participants of the physiotherapy group was also evaluated using Kendall's W, investigating the hypotheses of:

H1   There is agreement between participants in the physiotherapy group on the ratings of the behaviours

H0   There is no agreement between participants in the physiotherapy group on the ratings of the behaviours

H1   There is agreement between participants in the radiography group on the ratings of the behaviours

H0   There is no agreement between participants in the radiography group on the ratings of the behaviours

Consensus between the participants of the physiotherapy and radiography groups was evaluated using the Spearman's rho (rank order correlation coefficient) applied to the two sets of mean ratings. It quantifies the degree of association between the two sets of ratings by evaluating the consistency in the rank ordering of behaviours. The following hypotheses were investigated:

H1   There is agreement between the physiotherapy and radiography groups on the ratings of the behaviours

H0   There is no agreement between the physiotherapy and radiography groups on the ratings of the behaviours

The significance level for all analyses was established as p = .05 by convention, and two tailed hypotheses were employed throughout. Statistical analysis utilised the SPSS computer package for windows, version 11.

Non parametric analysis was used as the requirements for parametric analysis were not fulfilled, essentially because of the small sample size limiting a normal distribution and similar variance of the sets of data. The groups of interprofessional and nursing courses were not explored further owing to the low numbers in both groups, where assessing reliability within the group would be problematic. Open questions were analysed as for round 1. Interpretation of the findings for all of the analyses was confirmed through independent analysis of the descriptive and inferential data by the independent researcher and discussion of collaborative decision-making.

3.5.5.4   Round 3

Ranking of the importance of the behaviours

The 25th and 75th percentiles, medians and interquartile ranges were used to evaluate the importance of each behaviour to the construct through the participants' ranking. The 25th and 75th percentile described 25% and 75% of values respectively as smaller than or equal to the percentile value, while the interquartile range represented the range between the 25th and 75th percentiles (Sim and Wright, 2000). All three values therefore provide information on the spread of values. The mean, SD and CV were not used as nine of the 21 behaviours demonstrated a bimodal distribution.

Consensus

Level of consensus was evaluated descriptively through use of the interquartile range and medians. Inferential analysis of consensus was evaluated as for round 2 employing Kendall's W and Spearman's rho, using the same hypotheses. The existence of consensus cannot be used to define the 'correct' answer, and there is a possibility of finding collective ignorance (Jones and Hunter, 2000). It has therefore been advocated that results from the Delphi method should be explored with other methods (Pill, 1971), supporting use of the case study in providing the qualitative data for the mixed methods approach.

3.5.6 Reliability and validity

Issues of reliability and validity are central to quality in quantitative research, and have been discussed throughout the above sections. Reliability is the reproducibility of data while validity is centred on the data representing what it is intended to represent (Sim and Wright, 2000). Internal validity is concerned with the findings of the study and the conclusions developed, and external validity is centred on the generalisability of the findings. This is in contrast to measurement validity that consists of four components, and relates to the data and the resulting construct's potential use as a tool for assessment as discussed earlier. Face validity is established if a tool measures what it appears to measure and content validity describes the representativeness of the content. Concurrent validity evaluates a tool against existing external criteria, and construct validity evaluates the theory behind a test (Kerlinger and Lee, 2000). All issues are considered further in the discussion.

3.6 Qualitative Case Study

3.6.1 Design

An exploratory study is appropriate in situations where an area has only been partially explored and there is no existing body of theory to provide an explanation for it (Sim and Wright, 2000).

The case study was therefore aiming to:

> ➢ Find out what is occurring
>
> ➢ Seek new insights
>
> ➢ Ask questions, and
>
> ➢ Assess phenomena in a new light (Robson, 1993, p 42)

A strategy of a case study (Robson, 1993) was used to focus on the construct of Masters level clinical practice in its real life context, employing multiple methods of data collection from the qualitative paradigm. The use of multiple methods and therefore sources of evidence enable findings to be triangulated, and also facilitates examination of construct validity (Silverman, 1993). Triangulation is frequently used between methods to establish the greatest confidence in the validity of the findings. However, in qualitative research this issue is debated as the alternative argument is that data from different sources / methods will in reality produce different insights into the same issue rather than contributing to one 'picture' (Silverman, 1993). The case study was naturalistic (Lincoln and Guba, 1985), being conducted in the natural environment over which the researcher has minimal control and influence, and holistic in that it is attempting to understand the phenomenon in its entirety, as opposed to taking a

reductionist approach. The nature of the case study can also be considered as *idiographic*, to enable the construction of an in-depth picture of a case, with no intention of the transferability of data (Lincoln and Guba, 1985). The emphasis was therefore on depth rather than breadth.

Exploratory research questions are most effectively addressed through the collection of qualitative data (Robson, 1993), as they are intending to describe and categorise data rather than quantify. The phenomenon being explored in this study is recognised and understood in general terms. In the case study the qualitative data enabled further depth and insight to the data gathered by the Delphi, converging its findings with the real world situation. The case study can also therefore be considered as confirmatory (Robson, 1993), although this is contended by Barbour (1999) who argues that the convergence of data is more modest in qualifying findings, linking back to the issue of validity versus new insights discussed above. The differing assumptions behind the Delphi and case study are explicit throughout this study to enable convergence (Barbour, 1999).

Robson (1993) highlights that design can be planned initially but that it is essential that its evolution continues following the commencement of the study. An example of how the design evolved is illustrated through the initial plan to interview university examiners, but this was changed as data analysis proceeded and it was clear that the university examiners were encompassed through the documentary analysis and participant observations. Consistent with the characteristics of exploratory studies, the processes of design, data collection, and analysis overlapped (Sim and Wright, 2000).

3.6.2 Methods

3.6.2.1 Semi structured interviews of students and clinical tutors

Interviews are a common approach to address exploratory questions, and use 'conversation' to obtain research specific information (Robson, 1993), and are the most commonly used qualitative technique within the health environment (Britten, 2000). Semi structured interviews were employed to explore perceptions of the experience of clinical placement at Masters level by the students and clinical tutors. The use of interview allowed flexibility to reflect on previous and present experiences (Sim and Wright, 2000). The advantage of interviews is that they can move below the 'surface' for the areas being discussed, and therefore uncover ideas or aspects that were not known or anticipated at the commencement of the study (Britten, 2000). The interview also permits the researcher to check the participant's meaning rather than making assumptions. This was particularly important for this study because of the possible variation of terminology between participants.

The interview commenced with background information regarding the course, providing a question that the participants would be able to answer easily, and then moved on to more difficult topics. The topic guide was developed from the documentary analysis of the course documentation and the findings from the descriptive survey (Rushton, 2002; 2003) regarding the key aspects of the placement experience. This information provided important contextual information to the questions centred on the characteristics of Masters level practice and the assessment of that practice. A loose structure was applied to

the interview using open questions to define the area being explored (Appendices 8.8; 8.9). The interview subsequently evolved based upon the participant's responses. Emphasis on particular questions and the introduction of further questions was developed as the researcher became more familiar with the area being explored (Britten, 2000), and through the evolving analysis of the data for the case study and the Delphi. A pilot stage to the process of interviews was therefore not necessitated, as it was formally acknowledged that the process would be evolving, with each interview informing the next.

3.6.2.2   Participant observation of a clinical examination

A criticism of interviews and other similar techniques is often that we cannot be sure that people do as they say they do, and observation is therefore a useful method in starting to address this issue (Pope and Mays, 2000b). Participant observation engages the researcher in the activities of the group being observed, and therefore enables the collection of data through a sharing of experiences. The central tenet is that interpretation can only be achieved through participation, reflecting the sociological perspective of symbolic interactionism (Travers, 2001). The data reflect the interpretations of the observations made by the researcher. The observer can be viewed as the 'research instrument' and good interpersonal skills and sensitivity were therefore essential (Robson, 1993), as observational methods are centred round the observation of behaviour, actions and language. With this method it is acknowledged that it is again difficult to separate the data collection and data analysis stages of the research process. Participant observation was therefore a useful method in exploring the experience of the summative assessment of

student performance, where the construct of Masters level clinical practice is being used implicitly to assess performance[3].

3.6.3 Procedure

➢ A telephone call to the course tutor invited participation.

➢ A letter explaining the purpose of the study, a full proposal and participant information sheets (Appendix 8.10) were forwarded.

➢ A small incentive was apparent in that the course tutor was motivated to assist the researcher in light of the researcher's professional interest.

➢ The course documentation was requested. The documents represented all documentation from the institution regarding the selected course, for example the student handbook. Documentary sources provide a richness of data but there are some limitations of its use, for example, abbreviated, incomplete, or distorted information can be problematic (Sim and Wright, 2000).

➢ Documentary analysis informed the evolving conceptual framework of the case study and the development of the interview and participant observation guides for the researcher. To enable analysis, an understanding of the documentary medium is essential (Sim and Wright, 2000), and this was facilitated through the researcher's familiarity with the speciality. Evaluating the reliability, validity and authenticity of documentary sources can be problematic. However in this study the documentary sources were professional handbooks and are therefore formal public documents that present accepted professional views on the topic being explored.

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[3] For a more detailed analysis of interviews and observations, the reader is referred to Robson (1993).

> The methods of data collection were staged according to course structure (Figure 3.5, p 100).

Interviews

> It is recognised that the processes of qualitative interviews are difficult with many factors to consider (Britten, 2000). Preparation of the researcher for the role of interviewer through prior experience in interviewing and prior training was therefore essential.

> All participants were approached initially on the telephone when the purpose of the study was explained and their interest in being involved was established.

> The purpose was then reiterated prior to the interview when their informed consent was gained through the agreement of the interview to proceed.

> The interviews were all conducted at the participant's convenience at some point when the clinical placement was occurring.

> It is recognised that the setting for an interview affects the content (Britten, 2000), but with the emphasis on the real life context it was felt that the interviews were best completed within the clinical environment of the placement. This is justified through the placement occurring for a 3 or 4 week period but participants maybe only doing one placement in a year. This therefore ensured the focus of the interview.

> Field and Morse (1989) detailed some common problems encountered during interviews that were avoided as far as possible for this study. They include: interruptions, distractions, awkward questions, fright,

jumping around between subjects and the temptation for the interviewer to counsel the participant. Strategies were developed for avoiding or managing these potentially difficult situations, for example rephrasing problematic questions.

➢ Probing was a valuable tool for evaluating the dependability of the data, permitting clarification, depth, exploration of inconsistencies, and assisting recall (Barriball and White, 1994).

➢ Some interviews occurring post participant observation enabled issues from the observations to be explored.

➢ The interviews were tape recorded and transcribed verbatim. Pauses, sighs and laughs etc were recorded within the transcript although conversational analysis was not seen as necessary (Pope et al, 2000). (See Appendices 8.11 and 8.12 for examples of transcripts).

➢ The transcripts were sent to the participants for participant checking to enable comparison of the researcher's account to their account in order to comment on the agreement between the two perspectives (Mays and Pope, 2000), and afford the opportunity for any further comments following reflection on the interviews. Any comments from the participants were then developed into the analyses.

Participant observation

➢ Access to the environment of placement for the period of observation was initially negotiated with the course tutor and then through each clinical tutor and student individually.

➢ All participants were approached initially on the telephone when the purpose of the study was explained and their interest in being involved was established.

➢ The purpose was then reiterated prior to the observation when their informed consent was gained through the agreement of the observation to proceed.

➢ Notes were taken by the observer throughout the whole period of observation. The notes recorded events, timings and action, and documented some direct quotations to support ongoing analysis. The notes were structured around a list of points to observe (see Appendix 8.13 for the observation guide and Appendix 8.14 for an example).

➢ The representativeness of the period observed is a central issue in observation as a method (Pope and Mays, 2000b). The whole of the assessment process was therefore observed across different students, different clinical tutors, and different university examiners to explore this issue. It was clear that the format and content of the assessment process was very similar across all observations, essentially through standardisation from the university through the course tutor and the documentation.

➢ Data analysis proceeded concurrently with data collection. The emerging analytic categories and theoretical propositions were then tested during subsequent observations.

➢ Again, a pilot participant observation was not necessitated as the process of observation was constantly evolving.

3.6.4 Sample for the case study

In exploratory studies the sample size needs to be large enough to generate a volume of data that is sufficient to provide meaningful insights (Sim and Wright, 2000). Such a volume can be attained from a single or small number of participants depending upon the phenomenon and the participants. It has been argued that the important feature is the quality of the data obtained from the participant and not the number of participants (Sandelowski, 1995). However, if the number of participants is too small, sufficient diversity may not be obtained, and if too large, the meanings of an individual's response may be lost (Parker, 1994). The sample was therefore viewed as dependent upon the development of the study.

Purposive sampling was used, which is an example of non-probability sampling (Robson, 1993). In this method of sampling, the researcher's judgement is used to select participants based on their typicality and interest (Robson, 1993). One 'case' of a university course was selected and it was anticipated that the insights gained from this study would be developed through the use of further case studies in subsequent research. To enable familiarity with the case, an institution with a course in manipulative physiotherapy was selected, reflecting the researcher's specialist area. This enabled understanding of the context in the interpretation of data, and in particular facilitated use of the observational method. There is considerable debate regarding the characteristics of the researcher in qualitative research, with some authors advocating 'some familiarity' with the phenomenon being studied and a 'strong conceptual interest' (Miles and Huberman, 1994, p 46). Others advocate a lack of familiarity and a

'strong disciplinary stance' (Robson, 1993, p 160). To enable analysis of a

specialist course, it is argued that a strong conceptual interest was preferable to

facilitate an accurate context for the analysis. This interest was explicit within

the framework of the study and throughout the analysis of the data.

Purposive sampling subsequently identified the participants for the interviews

and the observational methods. This strategy ensured that the sample were

typical of the phenomenon being explored (Keen and Packwood, 2000). The

strategy of data collection reflected the conceptual framework (Robson, 1993),

as highlighted below (Figure 3.4).

Figure 3.4: Proposed strategy of data collection

```
┌─────────────────────────────────────────┐
│ WHO?                                     │
│ Students / clinical tutors / university  │
│ examiners on Masters course selected     │
│ from one university                      │
└─────────────────────────────────────────┘
                    │
                    ▼
        ┌───────────────────────┐
        │ WHERE?                │
        │ Clinical setting      │
        └───────────────────────┘
                    │
                    ▼
        ┌───────────────────────┐
        │ WHEN?                 │
        │ Across one academic   │
        │ year                  │
        └───────────────────────┘
                    │
                    ▼
┌──────────────────────────────────────────────┐
│ WHAT?                                         │
│ Course documentation                          │
│ Clinical placement experience through interviews │
│ Summative assessment of clinical performance  │
│ through participant observation               │
└──────────────────────────────────────────────┘
```
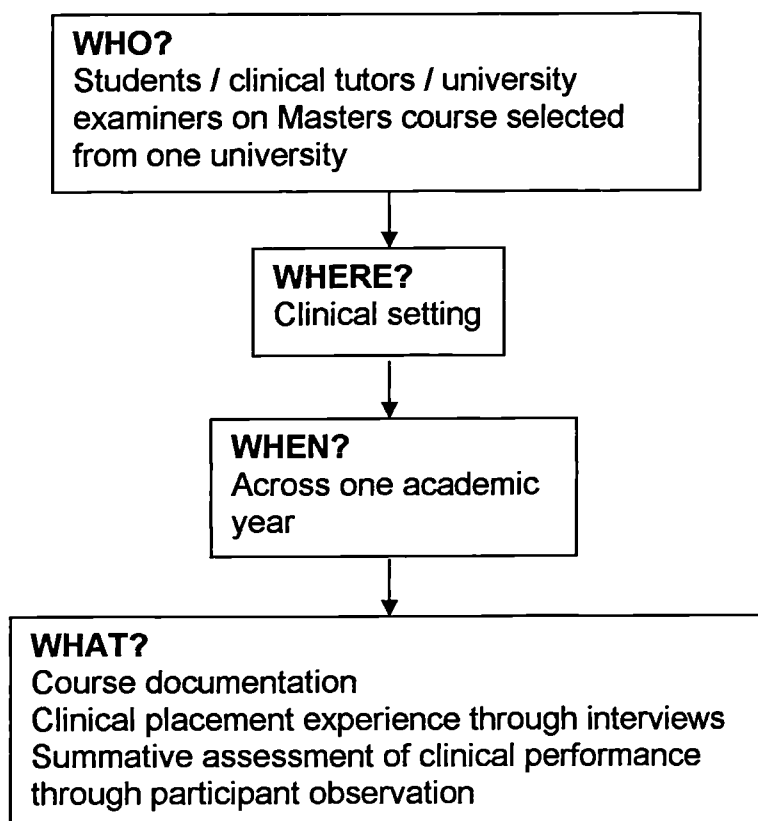
3.6.5 Data analysis

The ongoing data collection and analysis were continuously contributing to the conceptual and analytical framework that subsequently facilitated the interpretation of the findings (Keen and Packwood, 2000). The analytical framework was therefore predominantly derived from the data, and not imposed upon it. Deriving the framework from the data ensured that the researcher's interests did not influence the data excessively (Munn and Drever, 1990) and that all issues were included. A conceptual framework that did not evolve would therefore have limited data analysis.

Qualitative analysis of the data from the different methods used strategies broadly encompassed by 'content analysis'. Data analysis was an iterative process that involved the development of categories from the data, and testing and refining them to develop the theory. Coding of the data is agreed as a process of analysis (Miles and Huberman, 1994) as it is the meaning implied by the codes that is the important issue and these categories are therefore commonly described as analytic categories. The development of analytic categories was facilitated by the specialist manipulative physiotherapy and educational background of the researcher. Interim analysis was used (Miles and Huberman, 1994) that describes the ongoing processes of data collection and analysis. As well as contributing to the developing analytical framework, this form of analysis also permitted deviant or negative cases to be explored (Silverman, 1993).

The developed analytic categories were derived inductively from the data, being gradually obtained (Pope et al, 2000). Initially the themes within the interview transcripts and the observation notes were annotated in a process called 'indexing' (Pope et al, 2000). The process of indexing contributed to the analytic categories being developed. All data relevant to each analytic category were identified and explored through a constant comparative process. This process compared each component of the indexing to the rest of the data within an analytic category (Murphy et al, 1998b). A system of cross-indexing was also developed to enable recognition of data that fit into more than one category. The formation of the analytic categories was also informed by the methodological and theoretical perspectives of this study. Important themes were then selected for further exploration in interviews and / or observations. The identified analytic categories were subsequently linked to form relationships between them, theoretical propositions. This was a process of analytic induction and was characterised by iterative testing and re-evaluation of theoretical ideas using the data.

Saturation is an important issue in the analysis of qualitative data. It is a term used to describe the point at which the collection of further data will not provide any further benefit to the process of analysis (Sim and Wright, 2000). It is therefore used to determine the point at which data collection can cease, which is not determined by the volume of data obtained (Morse, 1995) but rather by no new analytic category being obtained. The quantity of data in an analytic category was therefore not theoretically important to the process of saturation (Morse, 1995).

The appropriateness of the concept of inter-rater reliability of the process of categorisation in qualitative research has been questioned. Some authors have argued that the findings of a qualitative study reflect the researcher's identity, and it would therefore be inappropriate to seek what would be different accounts from different researchers (Pope et al, 2000). Others have argued that the researcher contributes insights into the data that are unique so again a comparison would not be beneficial. In contrast to the Delphi study, categorisation of the data from the case study was therefore not explored through an independent researcher.

3.6.6 Quality of data analysis

A range of post positivistic approaches exist for determining quality in qualitative research. A discussion of the different approaches is however beyond the scope of this analysis that utilised the concept of 'trustworthiness'. Lincoln and Guba (1985) define trustworthiness in terms of credibility, dependability, transferability and confirmability. Credibility refers to the faithful description of a study and the ability of readers to recognise it (Lincoln and Guba, 1985). A key issue for credibility is researcher bias, for example through the researcher-participant relationship, or the information provided to participants (Fitzpatrick et al, 1996). In the interviews and observation the perceptions of the interviewer by the participants was important. The researcher also continuously considered the influence of personal characteristics on the interview and observation processes (Pope and Mays, 2000a and b).

Acceptance by the 'group' was assisted by the researcher's involvement within

manipulative physiotherapy, and in particular its Clinical Interest Group, the

Manipulation Association of Chartered Physiotherapists. A sufficient rapport and

empathy with the participants was therefore established in all cases that aided

in particular the process of observation (Pope and Mays, 2000b). However, it

has been documented that a potential difficulty of this acceptance may be an

expectation to reciprocate the favour of having been permitted access (Pope

and Mays, 2000b).

The directiveness of the researcher is considered an important consideration in

interviews and the degree of directiveness needs to relate to the nature of the

research (Britten, 2000) and this was monitored continuously throughout the

interviews. Holstein and Gubrium (1995) argue that all interviews are

collaborative enterprises, and that the interviewer and the participant are both

equally involved within the process in attempting to construct meaning. Any

issues arising were documented in the researcher's notes.

The presence of the researcher as observer within the fairly intimate

environment of a summative student examination was also potentially

problematic, recognising that behaviour may be influenced. The role of the

observer was overt in the observational components for ethical reasons, and

the researcher for example, took care in her dress and description of the study

so as not to influence the participants unduly. Another difficulty accepted for the

observations was of becoming completely immersed within the culture of the

processes taking place. This was very difficult and the researcher was

continually trying to focus on the task occurring through use of the observation guide.

The researcher has been described as contributing their own presuppositions to the research, for example regarding the value of the study, and the nature of the interaction with participants (Andrews et al, 1996). There was no issue in ensuring a similar basis of understanding across researchers as there was only one researcher, so the emphasis was therefore on clarity of the articulation of the researcher's presuppositions for this study throughout this thesis.

Dependability is the ability of a study to be auditable and followed by another researcher (Lincoln and Guba, 1985), transferability is the applicability of the findings across different contexts, and confirmability is equivalent to exploring the 'objectivity' of a study. All aspects will be explored later (section 5.2.4) but the explicit articulation of all details in particular, assisted these issues.

3.7   Concurrent procedures of the mixed methods approach

Figure 3.5 illustrates the concurrent procedures for the mixed methods approach.

Figure 3.5:   Concurrent timing of the Delphi and case study

Delphi study

Case study

```
┌─────────────────────────────┐
│ Distribution of round 1     │
│ December 2002               │
└─────────────────────────────┘
              │
              ▼
┌─────────────────────────────┐        ┌─────────────────────────────┐
│ Analysis of round 1         │        │ Documentary analysis        │
│                             │        │ February 2003               │
└─────────────────────────────┘        └─────────────────────────────┘
              │                                       │
              ▼                                       ▼
┌─────────────────────────────┐        ┌─────────────────────────────┐
│ Distribution of round 2     │        │ Placement 1                 │
│ March 2003                  │        │ Interviews & observations   │
└─────────────────────────────┘        │ March 2003                  │
              │                        └─────────────────────────────┘
              ▼                                       │
┌─────────────────────────────┐                      │
│ Analysis of round 2         │                      ▼
│                             │        ┌─────────────────────────────┐
└─────────────────────────────┘        │ Placement 2                 │
              │                        │ Interviews & observations   │
              ▼                        │ May / June 2003             │
┌─────────────────────────────┐        └─────────────────────────────┘
│ Distribution of round 3     │
│ June 2003                   │
└─────────────────────────────┘
              │
              ▼
┌─────────────────────────────┐
│ Analysis of round 3         │
│                             │
└─────────────────────────────┘

        ┌─────────────────────────────────────┐
        │ Convergence of quantitative and     │
        │ qualitative data                    │
        │ September 2003                      │
        └─────────────────────────────────────┘
```

Concurrent data collection & analysis

100

3.8   Ethical considerations

The methods of this study raise different ethical issues through exploring the implications of the research process for the fundamental ethical values and principles (Sim, 1997). The key issues are explored below.

3.8.1 Informed consent

Informed consent was gained through return of the questionnaire in the Delphi study, and through verbal agreement in the case study at the commencement of the interviews and participant observations. The issue of *disclosure* and therefore the *sufficiency* of the information (Sim, 1986) was evaluated carefully in considering the information provided to the participants verbally and in writing. The *comprehension* of the participants was anticipated as good owing to their backgrounds in the area being studied. Comprehension is dependent on the *intelligibility* of the information (Sim, 1986), and hence for students in particular, information was clarified verbally prior to the start of each interview / observation. The *competence* (Sim, 1986) of the participants to reach a decision that is rational and autonomous, presented no issues for this study. The final component of informed consent was the *voluntariness* of the participants, where the researcher exerted no pressure, or coercion for their participation (Sim, 1986). Having agreed to take part, participants were also assured that they maintained the right to withdraw from the study at any stage.

3.8.2 Privacy and Confidentiality

Privacy was maintained through requests to access the participants in the case study through the course tutor in the first instance, and for the Delphi through an initial enquiry that could be responded to if interested. Confidentiality relates to the management of the information that is gained about the participants (Sim, 1996). All participants were informed that their responses would be completely confidential, with the researcher maintaining sole access to them. They were informed that the Delphi questionnaires were coded for purposes of follow-up and were assured that this was the only reason for the coding, and that after the process of following up non-respondents was completed the coding system would be destroyed. All contact via email used blind copies to ensure confidentiality.

3.8.3 Anonymity

Participants were assured that any data summarised or published would not identify individuals or organisations. Subsequent publication will need to be considered carefully for the case study component with only one institution being explored, and this was acknowledged from the outset.

3.8.4 Deception

All information was planned ensuring there was no deception of the subjects through the processes of omission or commission (Sim and Wright, 2000).

3.8.5 Risk of harm

Care was taken throughout the different research methods to ensure that there was no risk of harm to participants. In particular, sensitive questions or areas within the interviews were managed carefully and the observation of the assessment process was managed as unobtrusively as possible. Care was taken not to exploit the participants in any way (Sim and Wright, 2000).

3.8.6 Ethical approval

Ethical approval that included independent external review, was gained from the School of Health Sciences at the University of Birmingham, the author's own institution (Appendix 8.15). Although at its time of planning, this study did not fulfil the criteria for Multi-centre Research Ethics Committee approval, all aspects of the study were completed within the Research Governance Framework for Health and Social Care (DOH, 2001). In particular, the planned research was reviewed independently to ensure that it met all ethical standards (DOH, 2001, point 2.2.2). Ethical approval was sought from the institution for the case study, with a full research proposal and covering documentation submitted to the Head of Faculty for consideration. The Faculty were however satisfied with the approval from the author's own institution, and did not require the researcher to seek further approval from their committee because of the nature of the research.

4.   RESULTS

The nature of both the Delphi and case study necessitates overlap of the

processes of data collection and data analysis. These concurrent processes are

therefore reflected throughout the results section.

Interview and participant observation quotations are utilised to provide

illustrative data of the developed analytic categories and theoretical

propositions. Although single quotations have been used predominantly, the

data have been analysed through a constant comparative process to ensure

credibility, dependability and confirmability of the findings. The quotations used

therefore capture the participants' responses. If contrasting views were

provided, more than one quotation has been used.

4.1   Results of the quantitative Delphi study

4.1.1   Round 1

4.1.1.1   Response rate

Of those course tutors contacted (n = 48), 38 agreed to participate in the Delphi

panel. All of the 38 participants subsequently responded to the round 1

questionnaire, providing a response rate of 79.1%. Table 4.1 details the course

background of the participants.

Table 4.1: Course background for the participants of round 1[4]

Course background	Number of participants
Physiotherapy	10
Nursing	3
Radiography	21
Interprofessional	4
Total no of participants	38

4.1.1.2   Analysis of the data

A large number of behaviours were provided by the participants, ranging from 7 - 20 behaviours for each participant. Content analysis of the data identified themes that were subsequently detailed as a behaviour. A total of 28 behaviours were identified as being indicative of the construct of Masters level clinical practice (Table 4.2). In totalling the number of times that each behaviour was provided, care was taken in ensuring that the phraseology was synonymous with the resulting description of a behaviour. For example, 13 different phrases were used that were judged as being synonymous with the behaviour 'critical use of evidence to inform practice'. For example: 'critical evaluation of the evidence base', 'incorporation of critically appraised evidence at different levels into the planning, execution and evaluation of treatment programmes', 'critically appraises professional literature and implements available evidence at all stages of management of patient', and 'ability to critically analyse evidence to enhance own professional practice'. The most commonly used phraseology was utilised in defining the behaviour. Although

[4] All radiography courses were diagnostic

the methodology defined a frequency of ≥ 2 for the inclusion of a behaviour, each included behaviour was provided by at least 4 participants.

Table 4.2: Behaviours provided by the participants as indicative of the construct of Masters level clinical practice (in order of number and percentage of participants providing the behaviour)

Behaviour	No of participants providing behaviour	% of participants providing behaviour
Critical use of evidence to inform practice	26	68.4
High level of clinical reasoning skills	25	65.8
Critical analysis in approach to practice	23	60.5
High level of communication skills	22	57.9
High level of clinical skills	21	55.3
Evaluation and audit of clinical practice	21	55.3
High level of self evaluation and identification of individual learning needs	20	52.6
High level of reflective practice	20	52.6
Advanced knowledge of subject area	15	39.5
Justification of examination procedures	13	34.2
High level of management skills	13	34.2
High level of decision-making skills	12	31.6
Motivation to advance knowledge	11	28.9
Synthesis of materials from a variety of sources	10	26.3
Effective engagement in multiprofessional situations	10	26.3
Involvement in formal teaching	9	23.7
Independent learning ability	9	23.7
High level of communicating conclusions	8	21.1
Advanced professionalism	8	21.1
Analysis of concepts / arguments	7	18.4
Advanced formulation of diagnosis / problem list	7	18.4
Adaptability of approach to fit new situations	7	18.4
Creativity and innovation of practice	7	18.4
Advanced problem solving	6	15.8
Contribution to clinical research / evidence base	5	13.2
Advanced analysis of data	5	13.2
Awareness of complex issues e.g. resource allocation, ethical and legal considerations	5	13.2
Autonomous / independent practice	4	10.5

<u>Consensus</u>

The most commonly occurring 3 behaviours were 'critical use of evidence to inform practice', 'high level of clinical reasoning skills', and 'critical analysis in approach to practice' that were provided by > 60% of the participants demonstrating very good consensus. In addition, 5 behaviours were provided by > 50% participants demonstrating good consensus.

Through the procedure described in the methodology (Section 3.5.5.2), the responses from the different groups according to course background were judged as similar by both the researcher and the independent researcher (Appendix 8.16).

4.1.1.3   <u>Findings relating to ease of task</u>

25 participants managed to list more than 10 behaviours as requested. In addition, their views on the ease of the task were grouped into three broad categories. The participants described the task as easy (n=18), moderate (n=9) or difficult (n=11). For those participants who found the task easy, their ease centred on being able to use existing documentation to assist them.

"The behaviours are the documented outcomes for the programme, therefore very easy to provide". (Nursing 2)

"Relatively easily as we had gone through a previous brainstorming process when we wrote our clinical assessment schedules for the MSc programme". (Radiography 16)

The participants who found the task moderately easy did not support their view with any other comments. For those participants who found the task difficult, their comments centred on the task being challenging.

"Challenging as many of the behaviours identified in the MSc Programme Document were fairly generic and required interpretation. As will be seen from the list one or two are not specific to clinical practice".
(Physiotherapy 10)

"Difficult because many of these are expected of new graduates, but in M level we are looking for a much higher skill level and mastery of their discipline...". (Radiography 15)

4.1.1.4   Findings related to 'any other comments?'

The following analytic categories were developed from the responses:

✓ Task prompted thought and consideration of issues

✓ Difficulty in distinguishing Masters level

✓ Difficulty in measuring behaviours

✓ Differences in terminology can be problematic

The first category of the task prompting further thought provided interesting insight into the challenging aspect of the task.

"This exercise has made me realise that although we have identified behaviours in the ......programme document, we have not explicitly documented these in clinical handbooks etc and rather have relied on implicit tacit understanding that these behaviours are required.....Thank you!". (Physiotherapy 10)

Some participants felt that distinguishing Masters from other levels was difficult.

"Some are obviously M level, others could be level 3 (examples

provided) but it would be the depth of reasoning and the ability to

articulate arguments and the expectations that would separate

undergraduate from postgraduate". (Physiotherapy 2)

A few participants expressed difficulty in measuring the behaviours.

"A Master clinician is novel and innovative - difficult to define what you

are looking for until you see it! They can and do move beyond the

assessor's expectation or experience". (Physiotherapy, 6)

Some participants experienced difficulty in the terminology used.

"Not sure about the difference between the terms behaviour, attribute, M

level descriptors, and learning outcomes". (Physiotherapy 7)

4.1.1.5   Decision-making for round 2

Feedback was provided to participants within the covering letter of round 2

(Appendix 8.4). Surprisingly, the behaviours obtained in round 1 were very

similar across the four groups. This was not anticipated from the previous

survey (Rushton, 2002) and the literature review, but was supported by the

analysis of the data by the researcher and the independent researcher

(Appendix 8.16). This therefore justified combining the four groups together for

round 2, presenting them with the same behaviours, and maintaining the ability

to validate this decision through analysis of the round two data across the

groups. An open question was also included to explore if any behaviours were

missing. Q2 therefore intended to explore the content validity of the derived list of behaviours (Appendix 8.5). Q3 explored the issue of terminology across professions / institutions as some variation was highlighted in the responses to round 1. For example, 'advanced practice' and 'high level' were often used interchangeably. Q4 provided the opportunity for any further comment.

As highlighted by the literature review, it had been anticipated that the behaviours contributing to the construct could be considered as two components: academic and clinical. In analysing the behaviours obtained, it seemed artificial to separate them into the two aspects, as participants had been very careful to word behaviours in the context of practice even if they could be considered 'academic'. This distinction was better explored within the discussion section in making the comparison to the consensus that already exists regarding Masters level academic work (e.g. QAA, 2001a).

4.1.2 Round 2

4.1.2.1 Response rate

37 participants responded to the round 2 questionnaire, providing a response rate of 77.1%. Table 4.3 details the background of the course for the participants. One of the interprofessional group course tutors was unable to respond owing to time commitments.

Table 4.3: Course background for the participants of round 2

Course background	Number of participants
Physiotherapy	10
Nursing	3
Radiography	21
Interprofessional	3
Total no of participants	37

4.1.2.2   Analysis of the data

Each participant rated the importance of the behaviours on a scale of 1 (not important) to 5 (very important) to the construct of Masters level clinical practice. The descriptive statistics for the behaviours are detailed in Table 4.4. A unimodal distribution existed for each behaviour with a negative skew of the distribution for most behaviours as reflected by the high means, medians and modes. Consequently non parametric statistics were used for the inferential analyses. However, the distribution for some variables approximated a symmetrical distribution (those with a lower mean, median and mode). The means were therefore influenced by the negative skew of the data, but as the data were unimodal, the use of means and SD were justified.

4.1.2.3   Agreement with the importance of the behaviours

There was high agreement from participants for the importance of most behaviours, as reflected by the high median, mode and mean scores. The mode was 5 for fourteen of the behaviours, 4 for eleven behaviours and 3 for three behaviours. The median was 5 for twelve behaviours, 4 for thirteen and 3 for three behaviours. The mean ranged from 2.95 to 4.73.

Behaviour	No	Mean	Median	Mode	SD	CV %
Critical use of evidence to inform practice	3	4.73	5	5	.51	11
High level of clinical reasoning skills	5	4.73	5	5	.56	12
Justification of examination procedures	8	4.62	5	5	.64	14
High level of clinical skills	4	4.59	5	5	.72	16
Critical analysis in approach to practice	6	4.59	5	5	.80	17
Independent learning ability	21	4.57	5	5	.65	14
Synthesis of materials from a variety of sources	1	4.51	5	5	.65	14
High level of reflective practice	27	4.51	5	5	.65	14
High level of self evaluation & identification of learning needs	18	4.49	5	5	.69	15
Advanced knowledge of subject area	12	4.46	5	5	.65	15
Advanced problem solving	9	4.41	5	5	.69	16
Motivation to advance knowledge	20	4.38	5	5	.79	18
Adaptability of approach to fit new situations	26	4.38	4	4	.59	13
High level of communication skills	13	4.35	4	5	.75	17
High level of decision-making skills	17	4.35	4	4	.63	14
Advanced professionalism	25	4.32	4	5	.75	17
Analysis of concepts / arguments	7	4.22	4	4	.75	18
Autonomous / independent practice	11	4.19	4	4	.84	20
High level of communicating conclusions	23	4.14	4	4	.79	19
Evaluation and audit of clinical practice	10	4.11	4	4	.81	20
Creativity and innovation of practice	24	4.11	4	4	.66	16
Awareness of complex issues	28	4.11	4	4	.66	16
Advanced formulation of diagnosis / problem list	**15**	**4.00**	**4**	**4**	**.85**	**21**
Contribution to clinical research / evidence base	**16**	**3.84**	**4**	**4**	**.83**	**22**
Advanced analysis of data	**22**	**3.69**	**4**	**4**	**.92**	**25**
Effective engagement in multiprofessional situations	**19**	**3.62**	**3**	**3**	**.79**	**22**
High level of management skills	**2**	**3.51**	**3**	**3**	**.87**	**25**
Involvement in formal teaching	**14**	**2.95**	**3**	**3**	**.85**	**29**

4.1.2.4   Consensus between participants

The consensus of agreement across all participants was good for most of the included behaviours. This is reflected in both Table 4.4 and Figure 4.1 that highlight the SDs, ranging from 0.51 to 0.92. Although the interpretation of the variability in scores is problematic as lacking in guidance from the literature, the key principle is exploring the size of the SD in relation to the mean. The error chart (Figure 4.1) therefore enables comparison of the means and SDs. The square indicates the mean value at its centre point, and the error bars denote one standard deviation above and below the mean.

Figure 4.1: Error chart of the participants' ratings of the importance of the behaviours
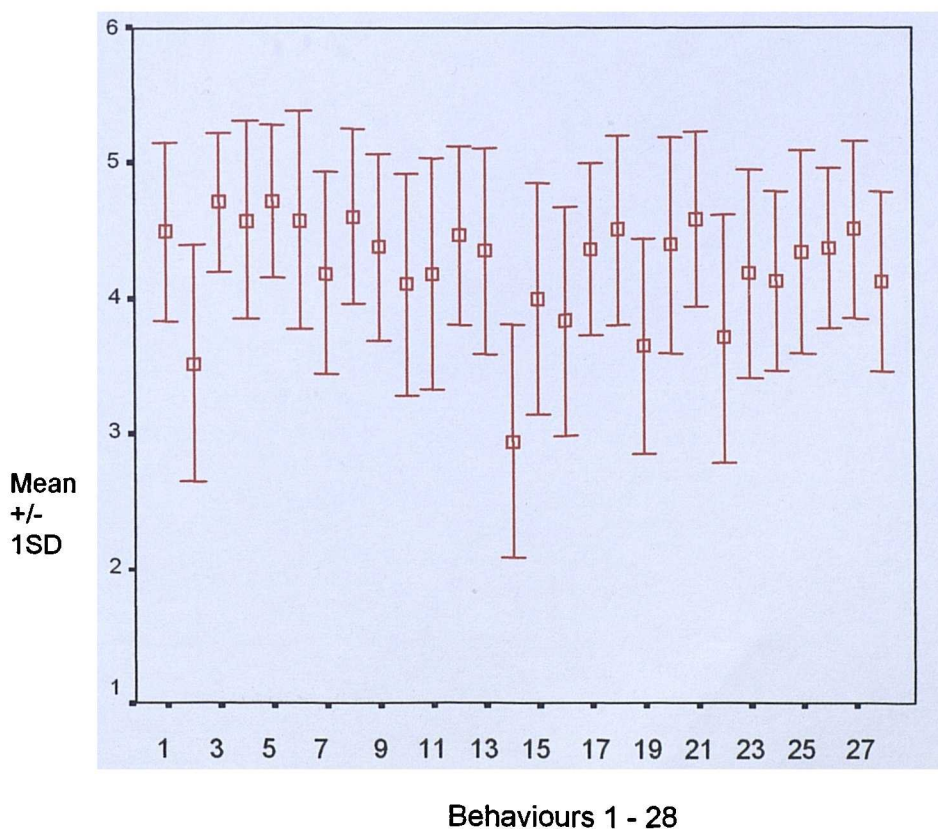
Behaviours 1 - 28

Figure 4.1 therefore illustrates some behaviours of a high mean and low SD indicating a good level of agreement with the behaviour, and good consensus

between participants (low variability in ratings). However, comparison between behaviours with the SD is problematic as the means varied considerably and the measure of SD is dependent upon the mean. The CV was therefore used to facilitate comparison (Table 4.4) as discussed in the methodology (Section 3.5.5.3, p 81).

Some behaviours were rated as less important to the construct of Masters level practice as reflected by low means. These behaviours were also characterised by high SDs, and in relation to the lower mean therefore as lower consensus between participants as reflected by the higher CV. The cut off point for consensus was therefore established as a mean > 4, and a CV of ≤ 20%. The mean of > 4 reflected the literature (Murphy, 1983, cited in Duffield, 1993) and 4 was a rating of 'important' as opposed to 'no opinion' for the Likert scale. The CV of ≤ 20% was informed through visual analysis of the data, and combined with the evaluation of the cut off point for the mean, did emphasise the same 6 behaviours (2, 14, 15, 16, 19, and 22) as demonstrating less consensus (in bold in Table 4.4).

Kendall's W indicated significant agreement between all participants (W = 0.289, df 27, $p < 0.001$) on the ratings assigned to the 21 behaviours (Appendix 8.17). The data therefore provide evidence to doubt the null hypothesis. Kendall's W indicated significant agreement within the physiotherapy group (W = 0.454, df 27, $p < 0.001$) and within the radiography group (W = 0.294, df 27, p < 0.001) on the ratings of the behaviours (Appendix 8.17). The data therefore provide evidence to doubt the null hypotheses. Spearman's rho using the means of the ratings for the behaviours indicated significant association

between the ratings by the physiotherapy and radiography groups ($r_s = 0.735$, $p < 0.001$) (Appendix 8.17). The data therefore provide evidence to doubt the null hypothesis.

4.1.2.5 Findings relating to any behaviours that participants would like to see added to the list

The option for providing any additional behaviours was answered negatively by most participants (n=29). Some behaviours were suggested by the other nine participants, although each behaviour was only detailed by an individual participant, and were therefore not incorporated into the analysis.

4.1.2.6 Findings relating to any wording that is problematic

Most participants did not have anything to add regarding the wording of the behaviours (n=22). Analytic categories were developed from the responses from the other participants:

- ✓ Potentially problematic qualification of terminology - 'high level' versus 'advanced'
- ✓ Behaviours required prioritising in some way
- ✓ Some behaviours unclear:
  - o 'Involvement in formal teaching' (Behaviour 14)
  - o 'Advanced professionalism' (Behaviour 25)
  - o 'Management skills' (Behaviour 2)
  - o 'Data analysis' (Behaviour 22)

✓ Some changes were suggested:

   o Removal of 'examination' from justification of examination

      procedures' (Behaviour 8)

   o Suggest 'effective communication skills' (Behaviour 13)

   o 'Communicating conclusions' is unclear and suggestion to change

      to 'demonstrates a high level of skill in communicating

      conclusions' (Behaviour 23)

   o Wording re 'adaptability of approach to fit new situations' implies a

      rigid approach not a reflexive one (Behaviour 26)

Some participants found the qualification of terminology difficult.

   "It is difficult to score the items when there is no qualification of what

   denotes 'high level' or 'advanced'. It would be helpful to have a guide to

   levels for these as it is very subjectively scored otherwise".

   (Physiotherapy 1)

   "Have concept of M level clinical practice being different to 'expert'

   practice. Therefore, a lesser experienced practitioner may be able to

   operate at M level but within a narrower and less deep scope of practice,

   hence I have difficulty with the wording 'high level of clinical practice /

   reasoning". (Interprofessional 2)

Some participants suggested that the behaviours would benefit from some form
of prioritisation:

   "It would appear that so many of the above are a high priority. It is hard

   to distinguish the value of one over another unless one is asked to

   prioritise them!". (Radiography 12)

4.1.2.7 Findings relating to 'any other comments?'

In addition to reinforcing some of the above issues, two analytic categories were developed from the data providing 'any further comments':

- ✓ Consideration of the boundaries of:
    - o Masters and Doctoral level
    - o Expert practice and Masters level practice
- ✓ Behaviours reflect the high expectations of any practitioner undertaking a clinical Masters course

Some participants felt that the boundaries between different levels of practice merited further consideration.

"I feel it is important to distinguish between 'experienced' and / or 'expert' practice and M level practice. I believe that they can coexist but also not coexist". (Interprofessional 2)

"Very difficult to know the boundary between M level and Doctoral level (many of the above would be expected of higher level) - this will be the problem facing practitioners when they consider advanced versus consultant level practice". (Radiography 15)

Several participants emphasised the high expectations of Masters level practice.

"... the M level clinical practitioner almost walking on water!" (Physiotherapy 10)

4.1.2.8   Decision-making for round 3 of Delphi

Those behaviours that demonstrated low consensus and low means reflecting their lesser importance were removed (2, 14, 15, 16, 19 and 22). The removal of some of these behaviours was also supported by the analysis of the qualitative data regarding the behaviours that participants found unclear. In addition the qualitative data highlighted the problematic behaviour of 'advanced professionalism' (Behaviour 25) by several respondents which was subsequently removed. Decisions were supported by the independent analysis of the independent researcher (Appendix 8.18).

The findings of consensus between groups supported the decision at the end of round 1 to maintain the groups together. The qualitative data suggested some rewording of behaviours and changes were made (Table 4.5). Some behaviours were not reworded if it was felt that the meaning would be changed. All of the decisions made for round 2 were also supported by the analysis of the independent researcher as discussed in the methodology (Section 3.5.5.3).

Table 4.5: Changes to the wording of behaviours prior to round 3

Behaviour no	Initial wording	Final wording
23	High level of communicating conclusions	High level of skill in communicating information
26	Adaptability of approach to fit new situations	Adaptability of approach to new situations

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Feedback was provided to participants within the covering letter of round 3 (Appendix 8.6). However all findings were not detailed to them specifically as the purpose of round 3 was very different. Round 3 asked the participants to rank the resulting 21 behaviours from 1 - 21 as to how important they perceived them to be to the construct of Masters level clinical practice. This request for ranking was supported by the analytic category emerging from the qualitative data of round 2 where it was suggested that it was difficult to differentiate the importance / priority of each behaviour. Q2 invited any comments on the process of ranking of the 21 behaviours as this had already been identified as potentially problematic within the methodology. Q3 explored the issue of boundaries between clinical levels of posts and Masters level clinical practice, an issue raised through the qualitative data of round 2. Q4 provided the opportunity for any further comment (Appendix 8.7).

4.1.3 Round 3

4.1.3.1 Response rate

34 participants responded to the round 3 questionnaire, providing a response rate of 70.8%. Table 4.6 details the background of the course for the participants. Two of the radiography course tutors were unable to respond owing to time commitments, and one radiography course tutor felt that the task was too difficult to complete.

Table 4.6: Course background for the participants of round 3

Course background	Number of participants
Physiotherapy	10
Nursing	3
Radiography	18
Interprofessional	3
Total no of participants	34

4.1.3.2   Ranking of behaviours

Each participant ranked the importance of the behaviours to the construct of

Masters level clinical practice from 1 (most important) to 21 (least important).

The descriptive statistics for each behaviour are detailed in Table 4.7. It was

inappropriate to employ the mean and standard deviation to explore the data as

nine of the behaviours demonstrated a bimodal distribution. The use of the

median and percentiles were therefore more appropriate.

4.1.3.3   Consensus between participants

The consensus of agreement between all participants was good for some of the

included behaviours. This is reflected in both Table 4.7 and Figure 4.2 that

illustrate the median and percentile values. The boxplot enables visual

comparison across the different behaviours. The thick black horizontal line

represents the median value. The top and bottom of the box denote the 75th and

25th percentiles for the data, and the length of the box therefore represents the

interquartile range giving an impression of the variability of the rankings. The

whiskers illustrate the range of rankings.

Table 4.7: Participant ranking of the importance of each behaviour to the construct of Masters level clinical practice (in order of median ranking of importance)

Behaviour	No	Median	Inter quartile range	Percentiles 25th	75th
High level of clinical reasoning skills	**4**	**3**	**7**	**2**	**9**
Critical analysis in approach to practice	**5**	**5.5**	**8**	**3**	**11**
Critical use of evidence to inform practice	**2**	**6.5**	**7.25**	**2.75**	**10**
High level of clinical skills	3	6.5	10.75	1	11.75
Advanced knowledge of subject area	11	6.5	9	4	13
High level of decision-making skills	13	8.5	9	5	14
High level of reflective practice	20	10.5	11.25	6	17.25
Synthesis of materials from a variety of sources	1	11	11.25	5	16.25
Advanced problem solving	**8**	**11**	**8.5**	**5.5**	**14**
Analysis of concepts / arguments	**6**	**11.5**	**7.5**	**6.75**	**14.25**
Autonomous / independent practice	10	12	12	5	17
High level of communication skills	12	12	11.75	4.75	16.5
High level of self evaluation & identification of learning needs	**14**	**12**	**8.25**	**7.75**	**16**
Adaptability of approach to new situations	**19**	**12**	**7.5**	**7.75**	**15.25**
Justification of examination procedures	7	13.5	11.5	7	18.5
Motivation to advance knowledge	**15**	**14**	**7**	**10**	**17**
Independent learning ability	**16**	**14**	**6**	**11**	**17**
Evaluation and audit of clinical practice	9	15	11	9	20
High level of skill in communicating information	17	15	9	8	17
Creativity and innovation of practice	18	15.5	11.5	7.75	19.25
Awareness of complex issues	**21**	**18.5**	**8.25**	**12.75**	**21**
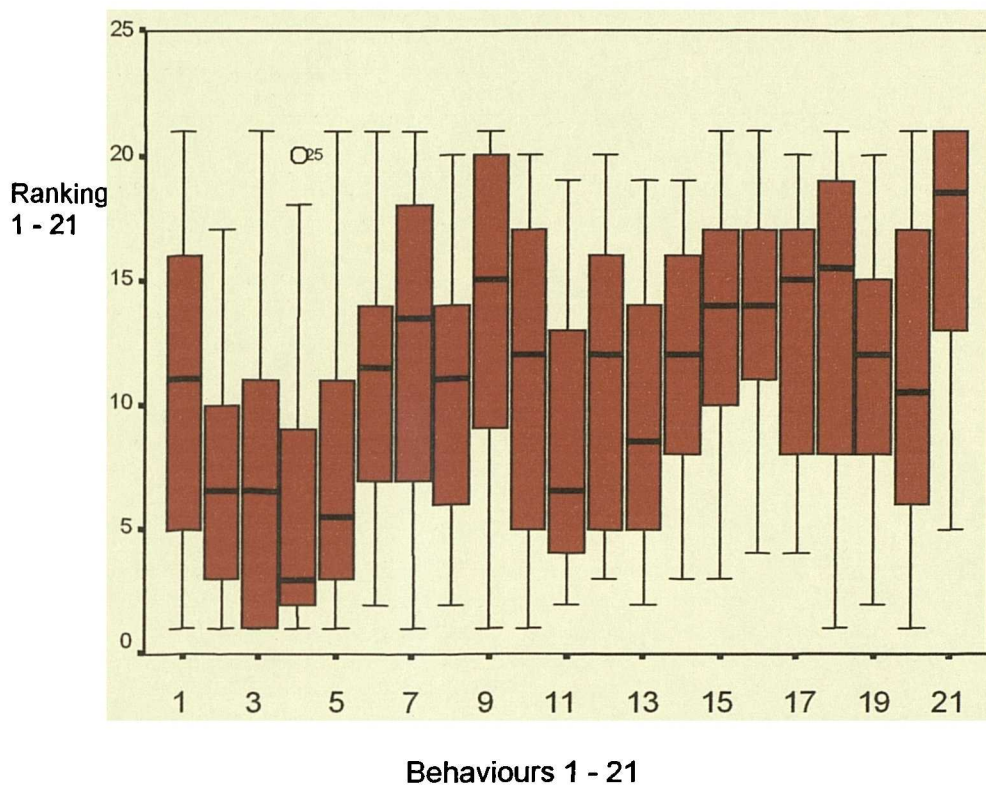
Behaviours 1 - 21

The boxplot in Figure 4.2 illustrates differences in the participants' ranking of the 21 behaviours as reflected particularly by the median values. However, the boxplot also illustrates high variability in the ranking of importance for most behaviours, as illustrated by the distributions of the interquartile ranges, which ranged from 6 – 12, and the full range of ranking (1-21) being used for 7 behaviours. The exceptions were the lower variability / consensus of ranking for the behaviours detailed in Table 4.8, with consensus established as an interquartile range < 9. These behaviours are also highlighted in bold in Table 4.7. The determination of consensus as an interquartile range of < 9 was justified through visual analysis of the data and in particular 9 representing the mid point of the range of interquartile values.

Table 4.8: Behaviours demonstrating consensus of ranking of importance to the construct

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Consensus as a high ranked behaviour (median 1–7)

Behaviour 4, 'High level of clinical reasoning skills' (median 3)
Behaviour 5, 'Critical analysis in approach to practice' (median 5.5)
Behaviour 2, 'Critical use of evidence to inform practice' (median 6.5)

Consensus as a middle ranked behaviour (median 8–14)

Behaviour 8, 'Advanced problem solving' (median 11)
Behaviour 6, 'Analysis of concepts / arguments' (median 11.5)
Behaviour 14, 'High level of self evaluation and identification of learning needs' (median 12)
Behaviour 19, 'Adaptability of approach to new situations' (median 12)
Behaviour 15, 'Motivation to advance knowledge' (median 14)
Behaviour 16, 'Independent learning ability' (median 14)

Consensus as a low ranked behaviour (median 15–21)

Behaviour 21, 'Awareness of complex issues' (median 18.5)

Kendall's W indicated significant agreement between all participants (W = 0.200, df 20, $p < 0.001$) on the rankings assigned to the 21 behaviours (Appendix 8.19). The data therefore provide evidence to doubt the null hypothesis.

Figures 4.3 and 4.4 illustrate the ranking for the physiotherapy and radiography course backgrounds respectively.

Figure 4.3: Comparison of the participants' ranking of the importance of the behaviours to the construct for the physiotherapy group
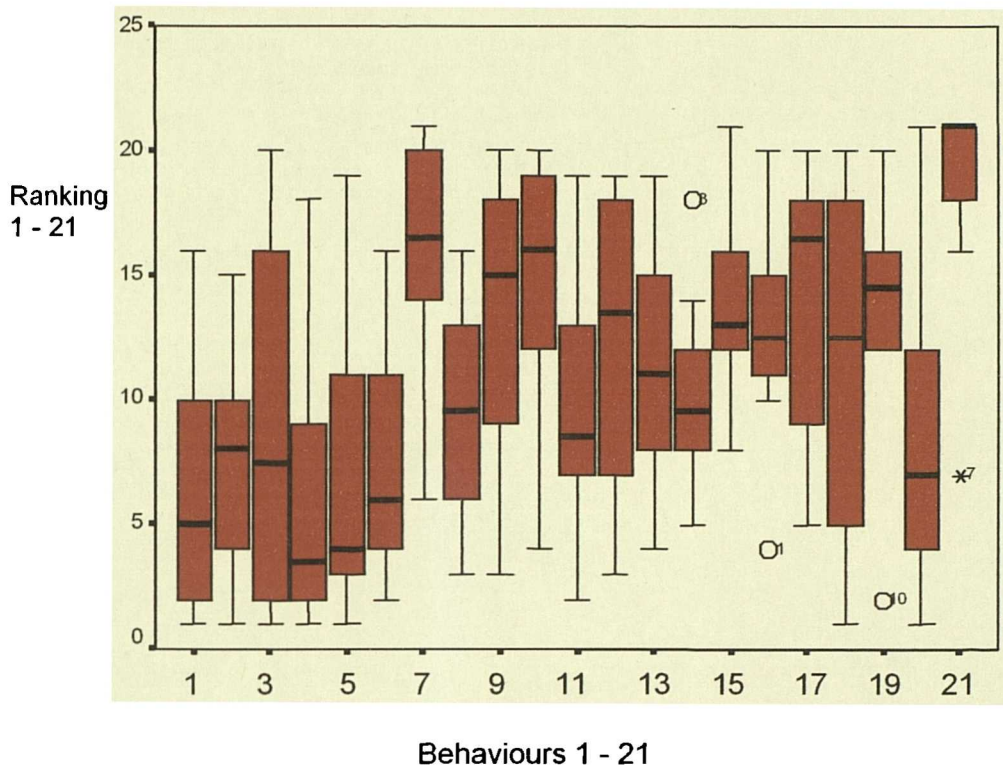
Behaviours 1 - 21

Figure 4.4: Comparison of the participants' ranking of the importance of the behaviours to the construct for the radiography group
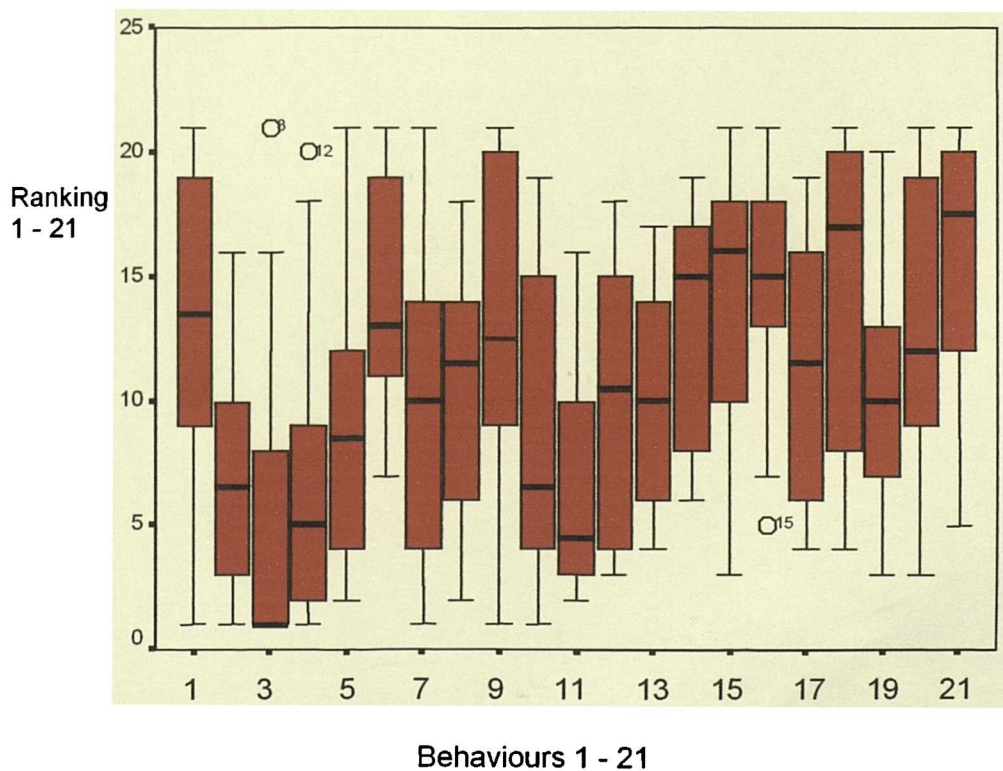
Behaviours 1 - 21

Table 4.9: Behaviours demonstrating consensus comparing physiotherapy and radiography groups (median in brackets)

Consensus as a high ranked behaviour to the construct	
Physiotherapy	**Radiography**
	Behaviour 2, 'Critical use of evidence to inform practice' (6.5)
	Behaviour 3, 'High level of clinical skills' (1)
Behaviour 4, 'High level of clinical reasoning skills' (3.5)	Behaviour 4 'High level of clinical reasoning skills' (5)
Behaviour 5, 'Critical analysis in approach to practice' (4)	
Behaviour 6, 'Analysis of concepts / arguments' (6)	
	Behaviour 11, 'Advanced knowledge of subject area' (median 4.5)
Consensus as a middle ranked behaviour to the construct	
Behaviour 2, 'Critical use of evidence to inform practice' (8)	
	Behaviour 6, 'Analysis of concepts / arguments' (13)
Behaviour 8, 'Advanced problem solving' (9.5)	
Behaviour 11, 'Advanced knowledge of subject area' (8.5)	
Behaviour 13, 'High level of decision-making skills' (11)	Behaviour 13, 'High level of decision-making skills' (10)
Behaviour 14, 'High level of self evaluation and identification of learning needs' (9.5)	
Behaviour 15, 'Motivation to advance knowledge' (13)	
Behaviour 16, 'Independent learning ability' (12.5)	
Behaviour 19, 'Adaptability of approach to new situations' (14.5)	Behaviour 19, 'Adaptability of approach to new situations' (10)
Consensus as a low ranked behaviour to the construct	
Behaviour 7, 'Justification of examination procedures' (16.5)	
Behaviour 10, 'Autonomous / independent practice' (16)	
	Behaviour 15, 'Motivation to advance knowledge' (16)
	Behaviour 16, 'Independent learning ability' (15)
Behaviour 21, 'Awareness of complex issues' (21)	Behaviour 21, 'Awareness of complex issues' (17.5)

Figures 4.3 and 4.4 highlight some interesting differences for behaviours demonstrating consensus within the groups that are detailed in Table 4.9. In addition, more behaviours demonstrated consensus within the groups and there was less variability in scores illustrated through the lower interquartile ranges and the full range of scores (1 – 21) being used for only 1 and 3 behaviours in the physiotherapy and radiography groups respectively. Kendall's W indicated significant agreement within the physiotherapy group (W = 0.302, df 20, $p <$ 0.001) and within the radiography group (W = 0.250, df 20, $p < 0.001$) on the ranking of the behaviours (Appendix 8.19). The data therefore provide evidence to doubt the null hypotheses. Consensus for behaviour 21 as a low ranked behaviour by all participants, and the radiography group and physiotherapy group justified its subsequent removal. In contrast, Spearman's rho using the medians of the scores for the behaviours, indicated no significant association between the physiotherapy and radiography groups on the ranking of the behaviours (r_s = 0.283, p = 0.214) (Appendix 8.19). The data therefore provide no evidence to doubt the null hypothesis.

4.1.3.4   <u>Findings relating to comments on the process of ranking</u>

Most participants contributed a comment to this question. The following analytic categories were developed:

✓ Difficulty of the process of ranking

✓ Some items similar

✓ Reliability of ranking questioned

✓ Value of the process of ranking

✓ Dependent upon area of clinical practice

All participants commented on the difficulty of the process of ranking, although their comments reflected several issues. All comments related to the difficulty of their interpretation of the construct.

> *"Very difficult since in fact these behaviours are all influenced by each*
>
> *other e.g. use of critical evidence is influenced by level of knowledge,*
>
> *critical ability etc". (Nursing 1)*

> *"Those behaviours which I have ranked as less important are only*
>
> *relatively 'unimportant' in that they should be assumed to be fully*
>
> *established and embedded at graduate level. The ones I have ranked*
>
> *most important are those which I think extend the practitioner into the*
>
> *construct of M level operation". (Radiography 18)*

Other comments reflected views that some behaviours should be considered equal and so the process of being asked to rank them was problematic.

> *"Some elements I would rank equally as high so not really a true*
>
> *reflection of my priorities". (Physiotherapy 4)*

Others found it difficult to differentiate between the behaviours as they all seemed equally important.

> *"There are likely to be a 'group' / 'minimum data set' of M level*
>
> *descriptors which describe the cognitive and psychomotor competencies*
>
> *and that within this 'group' they may all have equal importance. On*
>
> *reading your list I can see many of those which would be of equal*
>
> *importance (i.e. I might have scored 15 or more of them as a '1'), and I*
>
> *could not really put one above any other. This made it very difficult for*
>
> *me to rank. What this says to me is that you have managed to identify,*
>
> *through your methodology, many important / critical attributes at level M".*
>
> *(Radiography 11)*

Some behaviours were seen as similar and this contributed to the difficulty in ranking.

> *"The descriptors overlap which also complicated the process. So for example, I chose high level of communication skills as 3, and so my rank no 9 sits uncomfortably at no 9 (High level of skill in communicating information)". (Physiotherapy 8)*

A few participants questioned the intra-rater reliability of their ranking.

> *"There are too many variables to rationalise in 1 attempt. I am sure that if I repeated this process 5 times, there would be minor discrepancies in my list". (Radiography 19)*

Although a difficult process, several participants found the process of ranking thought-provoking.

> *"This was very difficult to do, all qualities / skills are important - but having to rank them made me realise that I feel clinical reasoning skills are the most important". (Physiotherapy 3)*

Some participants emphasised that they would rank differently for different areas of speciality.

> *"Different areas of clinical practice will be ranked differently; I assumed a musculoskeletal area, whereas mental health would have been ranked differently". (Physiotherapy 6)*

4.1.3.5   Findings relating to relationship between Masters level clinical practice and the grading structure within the NHS

Some participants did not feel able to comment on this question as they were not currently working with the NHS.

The following analytic categories emerged from the other participants.

- ✓ Equivalent to either:
  - o Experienced Senior I (Physiotherapy)
  - o Extended Scope Practitioner
  - o Clinical Specialist
  - o Advanced Practitioner (Radiography)
  - o Consultant Practitioner
- ✓ Recognition for this level of award in clinical practice is currently under recognised
- ✓ Hope that it will be recognised in the new NHS structure

A range of grades were provided as representing comparability to Masters level clinical practice.

> *"The Advanced Practitioner and Consultant Practitioner Descriptors match well with M level clinical skills". (Radiography 4)*

> *"Currently appears to be unrelated at lower grades, however, perception could be supported that M level practice should characterise 'clinical specialist practice' which may operate at Sen I / Super III / Clinical specialist grade. Anomalies appear where a less experienced clinician may have studied at M level, yet not be perceived to be 'experienced' enough due to lack of 'patient mileage'. Concept of 'experience' and 'expertise' muddied and influenced by traditional culture of professional socialisation". (Interprofessional 2)*

Although there was also a perception that Consultant Practitioner was different.

> *"At the practitioner / Advanced Practitioner level. Consultant level is more strategic and less concerned with service delivery than with service development". (Radiography 16)*

A strong perception existed that the formal recognition of this level of practice was absent.

> "The grading structure is fundamentally flawed and so it does not sit well with anything. Practice at M level should be rewarded with an adequate salary". (Nursing 2)

> "Whilst there has been some attempt to incorporate notions of mastery into higher level clinical activity and job specifications, the reality is that these skills are not generally identified / assessed particularly well by employers or demonstrated / articulated by staff. This leads to staff being recruited to posts who are perhaps not the most highly skilled / able, and others, who might me, are not considered or appointed". (Radiography 5)

However, it was anticipated that with continued development of the NHS this situation would change.

> "With Agenda for Change it would be good to see a Masters level clinician rewarded within the grading structure". (Physiotherapy 3)

4.1.3.6   Findings relating to 'any other comments?'

In addition to reinforcing some of the above issues a few analytic categories were identified, although most participants did not add anything further.

✓ Further guidelines required

✓ Professional Doctorate qualification now offered

✓ Consultant practice suggested at Doctoral level

The participants highlighted the necessity for guidelines.

"This work hopefully will provide some guidelines for those running and

intending to run M level courses". (Physiotherapy 1)

"It seems that the process of establishing criteria for advanced

practitioner status is incomplete and it would appear that there is

inconsistency both within and between professions in different health

care organisations. It could be that the results of this research may help

to redress the inconsistencies which are currently emerging".

(Radiography 18)

Some participants noted the increasing attention to the Professional Doctorate.

"Some Universities are offering a Professional Doctorate which

incorporates professional practice and original contribution to

knowledge". (Radiography 2)

The Professional Doctorate was linked to the Consultant Practitioner role.

" The operating level of the Consultant Practitioner should however go

beyond M level to be at the highest level of professional operation i.e.

Doctoral level skills and qualities.......". (Radiography 9)

4.1.3.7   Decision to discontinue Delphi

The decision was made to stop the Delphi after the 3 rounds as it had fulfilled its

aims of defining behaviours that are indicative of the construct, achieving

consensus in those behaviours. It had also explored the consensus across

professions, therefore addressing both research questions.

4.2 Results of the qualitative case study

4.2.1 Interviews with students (IS)

4.2.1.1 Participants

The participants for the interviews with students totalled 13 before saturation of data were achieved. Most of the students were fulltime (9), and 4 were part-time. Most of the students (8) were interviewed during their first placement and 5 during their second. The students' clinical experience since qualification ranged from 4 to 9 years, with a mean of 6.3 years of experience. All students were on placement using the collaborative model, being placed with another student. The students described the use of various strategies to assist their development of learning throughout the placement. These centred on observation and discussion, with some use of formal teaching sessions.

4.2.1.2 Analytic categories

Data from the 13 interviews (for an example of a transcript, see Appendix 8.11) were used to illustrate the components of the construct of Masters level clinical practice from the students' perspectives. The developed theoretical propositions and analytic categories are detailed in the researcher's perceived order of importance to the students based upon the total data from the interviews (Table 4.10). The theoretical propositions reflect components of the construct and the analytic categories the subcomponents.

Table 4.10: Theoretical propositions and analytic categories for the construct of Masters level clinical practice from student interviews

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Developed theoretical propositions
and analytic categories

Developed knowledge base
   Breadth of propositional knowledge across allied subject areas
   Drawing on personal knowledge
   Research informed knowledge

High level of clinical reasoning
   Abandonment of routine and prescription
   Specificity in identifying problem
   Prioritisation of data collection
   Integration of different forms of information to inform reasoning
   Hypothetico-deductive model
   Diagnostic reasoning
   Pattern recognition model
   Evaluation of patient progress to inform continued management

Justification of decisions

Critical analysis of evidence to inform practice

High level of psychomotor skills
   High level of precision of skills
   Adaptability of skills
   Quality / reliability of information gained
   Broad repertoire of skills

Creative practice

High level of confidence

Patient-centred approach

Self awareness

Critical approach to practice

Adaptability

The students equally emphasised the importance of knowledge and clinical

reasoning to the construct above all other components. There was also good

agreement across the other described components.

4.2.1.2.1 Developed knowledge base

All students commented on their development and use of knowledge throughout

the course. They placed greatest emphasis on the importance of propositional

knowledge.

Breadth of propositional knowledge across allied subject areas

The development of propositional knowledge was described through the

theoretical components of the course during specific modules. The emphasis

was on the breadth of the subjects / approaches to practice studied.

> *"I think my knowledge is just, has improved massively and I think it's also*
>
> *sort of broadened as well, ... I've taken in a lot more sort of ......*
>
> *different subjects, I suppose I kind of have more appreciation of the*
>
> *biology and pathologies, so ...... just my medical knowledge has*
>
> *improved a lot". (ISK[5])*

Drawing on personal knowledge

Some students also emphasised the importance of personal knowledge to their

development.

> *"All that background knowledge is useful, but you should be able to ......*
>
> *develop and apply these in different ways according to the patient". (ISL)*

---

[5] ISK = Interview with student K

They also acknowledged a link between personal knowledge to pattern recognition.

> *"And then drawing from a much larger base of previous experience*
>
> *........ you know you've got that five years or whatever of experience that*
>
> *you've had and your pattern recognition of things is stronger". (ISK)*

Research informed knowledge

The students emphasised the centrality of research to their use of knowledge in practice.

> *"Looking at the evidence, looking at the research, keeping up to date with*
>
> *the research. There is a move for everyone to do that, but I think I am*
>
> *going to do that more". (ISC)*

4.2.1.2.2 High level of clinical reasoning

Abandonment of routine and prescription

A key emphasis for the students was moving away from rules learnt as an undergraduate student and a prescriptive approach to decision-making. This subcomponent overlaps considerably with knowledge, but the students discussed it within the context of clinical reasoning.

> *"That you are less recipe driven. You're much more adapting things to*
>
> *person / patient, you're much more, ... really not interested anymore in*
>
> *sort of just ticking the boxes through this, this and this and going through*
>
> *this checklist and there is everything you must check". (ISK)*

They felt that the course recognised different possible ways of doing things that were equally valid.

"The thing I found most interesting and exciting about the course, which I

think is a new way of working is ...... that there isn't a right or particularly

a wrong way to do things. I thought I might come on the course and

everyone would be saying this is the right way to do things". (ISC)

Specificity in identifying problem

The students felt that their practice had often been vague and general in its

approach, and this was in contrast to Masters level where the emphasis was on

specificity. The aim was to find out what the problem was for the patient, and

then to focus the treatment to that problem.

"Masters level is more specific rather than generalising / mobilising

generally and not knowing where the problem is. It's being a lot more

specific and targeting where the problem is". (ISB)

Prioritisation of data collection

A key component of reasoning was the ability to make decisions within the data

collection process regarding what data are required to complete the picture for

that individual patient. The students described a move away from an approach

where they routinely collected all information.

"As an undergraduate you kind of check everything, and at Masters you

should be more aware of what could be causing it and what you should

be assessing and making it all more slick". (ISB)

Integration of different forms of information to inform reasoning

The students placed emphasis on the integration of all forms of information in

developing an understanding of the problem.

"I would never look at functional movements before but I look a lot more now. I think as well that knowing especially in this situation that things like pain, chronic pain and being able to stand back and say this is why it's not working because of this mechanism and explaining why the patient isn't getting any better". (ISH)

Hypothetico-deductive model

There was considerable evidence from the students to support development of a hypothetico-deductive approach to reasoning. Students described the process of formulating and testing hypotheses.

"I think it is just a case of being able to formulate a hypothesis based on what you know, test out the hypothesis and does that then help the patient move forward?" (ISE)

Diagnostic reasoning

In particular, the issue of differential diagnosis in looking to confirm a hypothesis was perceived as important. This suggested an emphasis on diagnosis and diagnostic reasoning for these students.

"I suppose again trying to draw out certain ideas from them, getting a possible hypothesis and then going in with your objective and again trying to go straight to a differential diagnosis rather than again undergraduate lumbar spine, bending down, standing up, straightening up, neural test, narrowing down, you know blah blah it's more sort of homing in". (ISM)

Pattern recognition model

There was also some evidence for use of the pattern recognition model of reasoning as characterising practice.

> *"Yes, another category other than your knowledge behind what you are asking them and what you expect to find, you know, my knowledge of conditions, has actually increased so I am going in, and I'm more able to pick up certain patterns when I look at a patient". (ISL)*

The pattern recognition model was balanced however by avoidance of closing down the reasoning process too early, and therefore encouraging a systematic hypothetico-deductive approach.

> *"I think the biggest thing that I've learnt is that a shoulder could be anything. A shoulder is not just a joint pain it could be anything and I think that ability to have a totally, go into it with a totally open mind and then narrow it down, rather than going in and mobilising the gleno-humeral joint". (ISM)*

Evaluation of patient progress to inform continued management

Ongoing reasoning was also seen as important throughout the patient management phase, characterising it as a continuous process with evidence of continued prioritisation.

> *"You're progressing your treatment, you're not just getting the patient back in to reassess everything, you're choosing specific objective markers and reassessing them with, you know, what's the next stage? What's going on now? Has my hypothesis changed?" (ISM)*

4.2.1.2.3 Justification of decisions

The students described Masters level as being able to justify all decisions.

> "........... and then being able to justify what you've done in terms of what you felt, what you saw and what the research says". (ISE)

This expectation for justification was also reflected explicitly in the interaction described between clinical tutors and students throughout the placement, where all activities would involve the tutor seeking a rationale behind actions and decisions.

> "Because they don't stand there telling me what to do...... it's very much been about 'why are you doing that? and what's your justification?' and then if I haven't got any then I soon realise I haven't got any and I have to start thinking more about it". (ISC)

4.2.1.2.4 Critical analysis of evidence to inform practice

A key issue raised by most students was the critical analysis of existing evidence to inform their practice.

> "I think ..... you are learning so much about research and by the end of it you need to be able to come out and be able recognise whether a paper is telling you something that is actually worthwhile looking at or telling you something about research that you can't actually conclude that much from when you actually look at the detail and understand what all the different words mean, research terms mean so, I can come out with an idea about how to read research in the future, and so from that you can

continue to learn and use that evidence with your patients in a correct

way and not just taking everything at face value". (ISL)

4.2.1.2.5 High level of psychomotor skills

Development of a high level of psychomotor skills encompassed four

subcomponents for the students.

High level of precision of skills

Accuracy and precision of skills were seen as very important. This issue also

centred on the sensitivity of the physiotherapist in gaining information from

different tissues.

> *"I guess there is a technical side where you should be able to*
>
> *demonstrate certain skills from a manual point of view, and probably feel*
>
> *things or develop a feel for tissues and joints and nerves or fascia more*
>
> *so". (ISA)*

Adaptability of skills

Within the development of psychomotor skills, the students felt that a

characteristic at Masters level was being able to adapt existing skills.

> *"I think a lot of physios are practising their techniques very skilfully*
>
> *already but it's probably being able to adapt that technique, to change*
>
> *that technique slightly to incorporate other techniques into that*
>
> *technique". (ISC)*

Quality / reliability of information gained

The precision was particularly important in terms of the quality of information

gained to inform the clinical reasoning processes, enabling its interpretation in

terms of existing knowledge.

> *"I think that was the thing I felt most excited about my Masters is I feel*
>
> *like I'm developing through manual touch and feeling now, it helps as*
>
> *well because before I used to think something before but now I am*
>
> *starting to feel things more. So it is not just ouch how does that feel?"*
>
> *(ISI)*

Broad repertoire of skills

Some students also felt that Masters level was about broadening their repertoire

of psychomotor skills, and described the learning of new skills.

> *"I wasn't doing any manipulations prior to the course, I hadn't done any*
>
> *extra training so that's a new asset to my repertoire that I haven't had*
>
> *before". (ISG)*

All aspects of psychomotor skills reflected use of process knowledge so the

students were indirectly emphasising the importance of this form of knowledge.

4.2.1.2.6 Creative practice

Creative or original practice through the development of new ideas was seen as

important. This was again reinforcing the movement away from rules and

prescription.

"I like the idea of being creative or trying anything rather than feeling you must try this for this and that for that, so being a creative clinician, about adapting as you go along, not sticking to formal assessment or treatment procedure". (ISC)

4.2.1.2.7 High level of confidence

All students described how their confidence in their practice had developed.

"I think with my colleagues the senior physios I work with already, I'm finding myself more confident amongst them and I feel as though through the course so far, I've become one of the lead clinicians in the department just from getting more involved with teaching with the senior members of staff". (ISC)

4.2.1.2.8 Patient-centred approach

The students described a focus on patient-centred practice at Masters level that most felt was new to their practice. This was characterised in particular by an increased emphasis on the value of patient interaction.

"it's much more about yes, being much more adaptive to the person and much more sensitive to their needs and what is appropriate to do with that person, so like you know, the subjective picking up what issues it has for them much more functionally led you know, how it is impacting on their life and you know, and then that then drives your objective and sort of brings it together and your management as well". (ISK)

4.2.1.2.9 Self-awareness

Several students saw self-awareness as a central feature of practice at Masters level. This was from a perspective of recognising one's limitations but also through developing learning by questioning practice.

"..... again in developing confidence with the patient and being aware of your limitations". (ISB)

4.2.1.2.10 Critical approach to practice

The students described a critical approach to practice as essential to their continued development.

"To think about what the technique is actually doing in a lot more detail or maybe what it's not doing and not necessarily just assuming it's doing what you might have been led to believe". (ISC)

4.2.1.2.11 Adaptability

As well as the adaptability of psychomotor skills described above, the students also described adaptability reflecting ongoing processes of evaluation, and therefore linked to cognitive function.

"And also obviously with our treatment techniques, showing ingenuity and sort of originality with treatment, and adapting principles that we know of the treatment for a specific patient. So not having to get everything out of a textbook, having the principles there and adapting them". (ISG)

4.2.1.3 Prioritisation of components of construct

When asked to prioritise the key component of the construct, 4 students were in agreement in prioritising clinical reasoning, and 2 students prioritised the integration of all of the components described. There was however no agreement between the other students and Table 4.11 collates the range of their responses.

Table 4.11: Most important components of the construct of Masters level clinical practice as perceived by the students

Most important component of the construct	Number of students
Clinical reasoning	4
Key is the integration of all components	2
Equal	1
Critical analysis of evidence to inform practice	1
Breadth of knowledge of associated areas	1
Equal weighting – it is the mindset that changes	1
Patient-centred	1
Prioritisation of data collected	1
Personal and process knowledge	1

4.2.1.4 Issues arising from process of participant checking of transcripts

No comments were made on the majority of the transcripts (n = 7). For the others, most comments were minor corrections of grammar or meaning (n = 4). On 2 transcripts more detailed comments were made to develop ideas that were explored in the interview. These comments did not however change the meaning of the content of the interview, but essentially provided additional information. They were therefore integrated within this analysis.

4.2.2 Interviews with clinical tutors (ICT)

4.2.2.1 Participants

The participants for the interviews with clinical tutors totalled 11 before

saturation of data was achieved. Most of the clinical tutors (7) were interviewed

during the first placement and 4 during the second. The clinical tutors'

experience of working with Masters students ranged from 0 to 23 years, with a

mean of 5.4 years. Some clinical tutors worked individually with students while

others worked with colleagues. All tutors who were new to the process had

been through the process themselves as a student, had been inducted by the

university and were also working jointly with an experienced clinical tutor. The

clinical tutors described common strategies used to develop learning, including:

assessing and managing patients, observation of students, discussion, formal

teaching sessions, role play, and reasoned accounts of management.

4.2.2.2 Analytic categories

Data from the 11 interviews (for an example of a transcript, see Appendix 8.12)

were used to illustrate the components of the construct of Masters level clinical

practice from the clinical tutors' perspectives. The developed theoretical

propositions and analytic categories are detailed in the researcher's perceived

order of importance to the clinical tutors based upon the total data from the

interviews (Table 4.12). The clinical tutors equally emphasised the importance

of clinical reasoning and knowledge to the construct, above all other

components within the interviews. There was also good agreement across the other described components.

Table 4.12: Theoretical propositions and analytic categories for the construct of Masters level clinical practice from clinical tutor interviews

Developed theoretical propositions and analytic categories

High level of clinical reasoning
   Moving away from rigid models of assessment
   High level of identification of cues
   Prioritisation
   Lateral thinking
   Ability to deal with multiple issues at once
   Justification of decisions
   Hypothetico-deductive model
   Pattern recognition
   Ongoing reasoning throughout patient encounter

High level of background knowledge
   Integration of knowledge and practice
   Use of personal knowledge
   Evidence based knowledge

High level of practical skills
   Accuracy
   Breadth of assessment and treatment techniques
   Adaptability

Adaptability

Critical approach to practice

Creative practice

Patient-centred practice

High level of self-awareness

Continuing professional development

High level of confidence

4.2.2.2.1 High level of clinical reasoning

All tutors commented on the centrality of clinical reasoning to the construct.

Several subcomponents were described as important to clinical reasoning.

Moving away from rigid models of assessment

The importance of moving away from rigid models of assessment was

emphasised very strongly.

> *"I'm pretty sure it's down to undergraduate teaching, you come out with*
>
> *that format of joints above and below. It's never taught out of you, when*
>
> *you qualify as maybe a junior physio they are completely unrealistic*
>
> *about the levels of supervision that they get, because they get virtually*
>
> *nothing, an hour to an hour and a half a week and that is no way going to*
>
> *progress you from the model that you are used to. I think even if you*
>
> *have been qualified for 5 years that's still kind of a model that is there. At*
>
> *M level you need to be breaking that model down really and giving them*
>
> *the confidence to explore things much more dynamically". (ICTP[6])*

High level of identification of cues

The identification of cues from the patient was perceived as important to

gathering appropriate data.

> *"Really easily picking up patient cues of what their main functional*
>
> *problems are that should come easily, but that they actually have the skill*
>
> *to explore those a bit more thoroughly". (ICTS)*

---

[6] Interview with clinical tutor P

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Prioritisation

The issue of prioritisation was described repeatedly, and emphasised as a higher-level skill.

> "Taking information you've got and being able to make a decision on that, and then tailoring your objective to that, knowing what you need to test and what you don't need to test, what is the priority". (ICTQ)

Lateral thinking

The ability to think laterally as part of the process of clinical reasoning was seen as essential to the effective assessment and management of patients.

> "Lateral thinking, I think, so not going down one path, definitely". (ICTX)
>
> "I think that, what encapsulates that for me is that they can ...... reason around something and see things from different angles, that would be it". (ICTY)

Ability to deal with multiple issues at once

With reference to the management of more complex patients, the clinical tutors described the ability to manage multiple issues at once.

> "Because that is coming down to complex problems that you expecting people to do at these levels. ....That's what you have to do with the more complex patients and they should have the ability to treat in their head more than one thing at a time". (ICTU)

Justification of decisions

The issue of justifying all decisions was described as part of the processes of clinical reasoning.

"...... that they can see the purpose behind asking a question or why they are doing that test, and what does it mean". (ICTV)

Hypothetico-deductive model

Most of the comments related to clinical reasoning linked implicitly to the hypothetico-deductive model. Some clinical tutors were also explicit.

"......at this level they should know straight on from their subjective where they need to focus and start and be able to explore those really thoroughly, and get you know the right evidence to help them form their hypotheses. And that should be coming from that first visit, that they should be confident enough with what they have done subjectively and objectively wise to be able to come out with a confident clinical hypothesis about that patient and to be able to really reason that back though". (ICTS)

Pattern recognition

One clinical tutor described the reasoning process of pattern recognition.

"Clinical reasoning includes pattern recognition at Masters level". (ICTR, additional comment)

Ongoing reasoning throughout patient encounter

The processes of clinical reasoning were seen as continuous, commencing with patient assessment and continuing through patient management.

"They are usually not very good at re-evaluation and reassessing, getting so stuck on getting the subjective and objective right, they forget that when they actually intervene they need to reassess, and even during

their objective they are forgetting to reassess and see the impact of what

they are doing". (ICTT)

4.2.2.2.2   High level of background knowledge

Most tutors described the importance of knowledge to the construct, although it was not always clear what forms or context of knowledge they were describing. There were three subcomponents identified.

Integration of knowledge and practice

The integration of knowledge to practice was seen as essential to the construct and described as the background for all practice. The emphasis appeared to be on propositional knowledge, with some reference to process knowledge.

> *"We can begin to discuss the different ideas within physio, the different*
>
> *scientific ideas, physiological anecdotal ideas and really begin to draw in*
>
> *what's available from texts into clinical practice rather than keeping them*
>
> *separate which is what I think happens a bit at an academic level".*
>
> *(ICTP)*
>
> *"They are taking theoretical knowledge, stuff they've read, applying it and*
>
> *reasoning through why they are doing things, so they are being very*
>
> *critical of what they're actually doing and actually demonstrating that they*
>
> *can actually prove why they're doing it from what they've read". (ICTR)*

Use of personal knowledge

Use of personal knowledge was implicit through the integration of knowledge and practice, but was specifically raised by one clinical tutor.

"I think having a broad patient knowledge and being able to use this with the patients". (ICTV)

Evidence based knowledge

The importance of evidence from research to inform propositional knowledge was emphasised.

"Masters level – up to date on awareness of all evidence based

information relevant to area of speciality". (ICTR, additional comment)

4.2.2.2.3   High level of practical skills

Most clinical tutors described a high level of practical / psychomotor skills as characterising the construct.

"Really excellent handling skills, that would be something I think,

particularly the choice of Masters they've done and they are manual

orientated even though there are the other aspects of it, but you know

that they should have excellent handling skills". (ICTS)

Accuracy

Accuracy / precision of techniques was seen as important to ensure the quality of the information gained from the technique or maximal effectiveness.

"...... your intra-tester reliability being good, so thinking carefully about

how we do things and practising". (ICTX)

Breadth of assessment and treatment techniques

The breadth of techniques within the practitioner's repertoire was emphasised.

"Basically looking at their, I suppose, just having a higher level of

assessment technique and maybe having a large repertoire of treatment

techniques as well, and being able to perform them effectively". (ICTQ)

Adaptability

The ability to adapt the practical skills to individual situations was emphasised.

"The other thing that I think is really important is being able to adapt your

skills, assessment skills for example, looking at if you were doing a PA

[posterior to anterior directed technique] you don't just do it in lying or

sitting, you could do it in standing or sitting and you can adapt your

manual therapy skills and explore things in lots of different positions.

There is no right way to do a PA". (ICTX)

4.2.2.2.4   Adaptability

Flexibility or adaptability of approach was seen as central to the construct. This

was linked to cognitive skills in this context but was also raised as an issue for

psychomotor skills (see above).

"These should be thinking on the hoof, and they should be changing their

questioning and their objective examinations in response to the patient".

(ICTU)

4.2.2.2.5   Critical approach to practice

A critical approach to clinical practice was encouraged within the students, with

the perspective that this was a distinguishing feature of the construct.

"I think reading is quite an important simple aspect, that you know they

have read widely and that they have read the relevant literature and are

able to analyse that well, ... but then bring that back into clinical

practice and questioning everything that they do, and questioning the

evidence that is already out there and not being just accepting". (ICTS)

4.2.2.2.6   Creative practice

Creative practice was encouraged, and this was linked to an ability to think

laterally.

"Using quite innovative creative techniques and not being kind of bog

standard, text book techniques you know being able to think laterally and

creatively". (ICTS)

4.2.2.2.7   Patient-centred practice

Most clinical tutors encouraged a model of patient-centred practice.

"Being able to decide when you can, not just with the actual information

but also with the patient themselves. They are all individual so it's being

able to deal with them as an individual, and to tailor your assessment

process to that person and their ability to understand what you're saying

or the ability to comprehend what's going on, their personality obviously".

(ICTQ)

4.2.2.2.8 High level of self-awareness

Several clinical tutors perceived self-awareness and evaluation as important to learning and developing Masters level practice.

"I hope that they will actually be able to be more critical and reflective of what they're actually doing, and to be able to pick up on things that maybe they recognise in themselves that they can take forward, and to be able to self-assess and develop themselves more". (ICTR)

4.2.2.2.9 Continuing professional development

A couple of clinical tutors emphasised the importance of continuing education to the development of Masters level practice.

"......in a busy working environment you might need to sit and make sure you are actually still challenging yourself and not getting into ruts, I think that's a danger sometimes. Well that worked and I will just carry on doing that. And they need to be continuously evaluating critically, evaluating and assessing what you're doing and I think that can be a danger......". (ICTR)

4.2.2.2.10 High level of confidence

Confidence was raised as an important issue by some tutors.

"A confidence in your skills I suppose and an awareness in what your skills are, and an ability to be able to demonstrate that". (ICTT)

4.2.2.3 Prioritisation of components of construct

When asked to prioritise the key component of the construct, 7 clinical tutors were in agreement in prioritising clinical reasoning. There was however no agreement between the other clinical tutors and Table 4.13 collates the range of their responses.

Table 4.13: Most important components of the construct of Masters level clinical practice as perceived by the clinical tutors

Most important component of the construct	Number of clinical tutors
Clinical reasoning	7
Flexibility	1
Integration of all components	1
Lateral thinking	1
Criticality of practice	1

4.2.2.4 Issues arising from process of participant checking of transcripts

No comments were made on the majority of the transcripts (n = 7). One transcript included minor corrections of grammar or meaning, and three transcripts included more detailed comments to develop ideas that were explored in the interview. These comments did not however change the meaning of the content of the interview, but provided additional information. They were therefore integrated within this analysis.

4.2.3 Participant observation of examination of clinical practice (PO)

4.2.3.1 Participants

Seven examinations were observed in total before saturation of data were achieved. Most examinations (5) occurred during the first placement, and 2 occurred during the second placement. The first placement examinations were centred on the management of two returning patients. The second placement examination was centred on the management of one unseen new patient.

4.2.3.2 Components of the examination process

Table 4.14 details the components of the process of examination that were common to all observations.

Table 4.14: Components of the examination process

Components of the examination process	Characteristics of the component
Student-patient interaction	Examiners observing student actions in assessing and managing patients
Examiner-examiner interaction 1	Discussion of observations and identification of areas to explore
Examiner-student interaction 1	Discussion of identified areas with student
Examiner-examiner interaction 2	Discussion of student performance, decision re grade and feedback
Examiner-student interaction 2	Feedback to students on performance

4.2.3.3 Analytic categories

Data from the 7 participant observations (for an example of the observer's notes, see Appendix 8.14) were used to illustrate the components of the construct of Masters level clinical practice as suggested by the observations. The developed theoretical propositions and analytic categories are detailed in perceived order of importance to the researcher based upon the data from the participant observations (Table 4.15).

Table 4.15: Theoretical propositions and analytic categories for the construct of Masters level clinical practice from the participant observations

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**Developed theoretical propositions
and analytic categories**

Clinical reasoning
  Prioritisation of data collection
  Specificity
  Ongoing process of evaluation
  Ongoing reasoning
  Diagnostic reasoning

Justification of decisions

Patient-centred practice

Precision of practical skills

Adaptability

Critical approach to practice

Knowledge
  Breadth of propositional knowledge
  Evidence informed knowledge
  Effective use of process knowledge
  Effective use of personal knowledge
  Integration of all forms of knowledge

Self-analysis

The observations highlighted two components as most important to the construct of Masters level clinical practice, of clinical reasoning and the justification of decisions. This was supported by the primary aims of the examination process centred upon a student's articulation of their clinical reasoning and their ability to justify their decision-making (as evidenced by the examiners' discussions, the operationalisation of the marking criteria for the assessment, and the agreed feedback written by the examiners). There was good agreement across the other described components of the construct as supported by early saturation of data. Although two different forms of examination were observed, the aims and content of the two processes were identical, the only difference being the context of the examination of either a new patient or returning patients. Saturation had been achieved after 5 observations, but this was evaluated against the different form of the examination for the second placement. The most useful components of the process in providing insight into the construct were through the processes of examiner-examiner interaction, and their decision-making and rationale behind the evaluation of Masters level performance.

4.2.3.3.1   Clinical reasoning

Clinical reasoning was the key component of the examiners' questioning of a student, as they explored the student's articulation of their reasoning throughout the encounter with the patient. This was evidenced through an examiner's explicit articulation of this as the aim of the process of discussion to the student. Emphasis was placed on the following subcomponents of clinical reasoning.

Prioritisation of data collection

This issue was influenced by the time constraint upon the students for the examination. The timing forced students to carry out prioritisation, highlighting it as a key aspect of performance for the examiners. Prioritisation was illustrated by a patient revealing a new area of symptoms not previously mentioned, and the student asking the examiner:

"How much time"? (PO1[7])

This enabled the student to make decisions based upon the amount of time remaining for the examination.

The students also articulated their processes of prioritisation to the patient. For example a student explained their current emphasis on the lumbar spine to a patient, explaining that they would.

"Keep an eye on the hip". (PO1)

This highlighted the lesser importance of the hip at this stage.

Examiners also identified prioritisation as an issue in their areas selected for discussion / feedback.

"Why examine arm movements?" (PO6)

"Different levels were implicated and the student explored this, but this was not best use of time". (PO7)

Specificity

The students were very specific in their gathering of information from the patient to ensure the quality of the information gained.

"Where is that tender?" (patient points to area of body) ....."right in the joint there?" (PO1)

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[7] PO1 = Participant observation 1

The specificity and quality of the information was also reflected in the feedback to the students.

"Reassessed, but could have explored further, for example, some hands-on to explore skin / fascia to inform decision would be good". (PO2)

Ongoing process of evaluation

Student performance illustrated an ongoing continuous process of evaluation, for example, when comparing findings of a test to those carried out earlier in the process of examination.

"Remember those movements we did before? We are now going to look at them again?" (PO1)

Patients were questioned constantly regarding their symptoms and the detail of what they were experiencing to inform ongoing processes of reasoning. They were evaluated before and after each treatment to assess any change in their presentation. For example evaluation of foot pulse before and after a connective tissue massage technique (PO1). Emphasis on evaluation was also illustrated through feedback.

"Did not reassess sacroiliac joint to evaluate any change". (PO5)

Ongoing reasoning

The ongoing process of reasoning was evidenced by the constant evaluation of the patient as described above, to inform ongoing decision-making. This encompassed continuous consideration of management that was integrated with assessment throughout. For example, using a hip treatment technique to evaluate any immediate effect of the treatment, also therefore informed development of understanding of the patient's problem (PO3).

Ongoing reasoning was also evident throughout the period of discussion as the student was asked to explain their planned reasoning across subsequent visits (PO2). In some cases questions were posed to evaluate if the student's management of a patient was being considered as an ongoing process, for example where examiners felt that the patient's progress had not changed since the first visit (PO3).

Diagnostic reasoning

An emphasis on diagnosis was frequently used as the opening question for the discussion.

"What is the source of this catching pain that she has now?" (PO3)

The students' emphasis on differential diagnosis was evident from both their testing of patients and the discussion. They varied their testing to differentiate between different structures and this subsequently formed the basis of questions in the discussion (PO2). An emphasis on diagnosis was also reflected in feedback.

"Vague regarding the differential diagnosis of neural components." (PO2)

4.2.3.3.2 Justification of decisions

This was perceived as an important area by the students as the stronger students voluntarily linked to the literature throughout in answering questions, and articulated justification of their decision-making. For example,

"The literature suggests the deep neck flexors have a positive effect on headache according to Jull, 2002". (PO2)

This was also a key aspect of the examiners' evaluation as evidenced by their discussion of the patient assessment, and identification of the questions that they wanted to raise to assist their overall evaluation of the student (PO4). They explored the rationale behind key decisions made by the student and any aspects that they were unsure of. For example, the student's interpretation of their findings from a particular test and how that informed subsequent decisions (PO6). Also why they had included a particular test, or why they had selected a particular treatment technique and what were they hoping to achieve (PO4). The students were therefore asked to articulate their thinking throughout the different stages of the process to enable the examiners to evaluate the level of their performance. The starting point for questioning was usually the student's overall impression of the patient and their problem, and the questions then followed through the whole process.

"Why did you choose to look at him in high kneeling?" (PO4)

Feedback also highlighted where students had effectively or ineffectively justified decisions.

"Good justification for choice of assessment techniques". (PO7)

"Decisions for treatment were not logically followed through and explained regarding choice of technique and integration of muscle".
(PO1)

4.2.3.3.3   Patient-centred practice

Patient-centred practice was evidenced by students seeking the patient's perspective from the commencement of the assessment process. They also

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permitted patients to raise key issues, while at the same time guiding the

examination process and data collection to meet their own needs. For example,

"When did the hip start to affect you"? (PO1)

Patient centred practice was also evidenced by the constant explanation to

patients regarding the process of examination, the rationale behind the tests

used, and clear articulation of the information required from the patient. For

example, any differences in a patient's presentation compared to their last visit

were explained (PO3). This followed through to any treatment, when the

reasoning for the treatment was explained to the patient. This interaction with

the patient was based on establishing a good rapport and also the use of

strategies such as humour (PO2).

The emphasis on the patient was also demonstrated through empathy (PO7),

and followed through to the end of the patient encounter with students providing

the patient the opportunity to ask any questions before they went. Any

questions posed by the patients were also addressed as part of the process of

interaction. For example,

"What does the taping do"? (PO1)

Examiner feedback also supported a patient-centred model of practice.

"...... but treatment plan not attuned to the patient's expectations". (PO6)

4.2.3.3.4 Precision of practical skills

An emphasis on the precision of practical skills was evidenced by attention to

positioning of the patient through clear instructions and the checking of the

position achieved (PO7), with plinth height being constantly adjusted. It was

also evidenced through movement of the examiners to enable close scrutiny of

the tests or treatments applied (PO6). Precision was reflected throughout assessment and treatment skills, for example through the clarity of instructions to enable a patient to perform an exercise.

"and again, lifting up, good, and again dropping down and back". (PO1)

The instruction was also accompanied by tactile facilitation of the intended technique.

In addition, questioning of the patient about a technique assisted precision.

"At the moment, how much effort are you putting in to holding that position?" (PO4)

Correction of an incorrect technique was also seen.

"Good, but remember not to hold your breath". (PO1)

Students also palpated to ensure that any exercise was achieving the desired effect at a local level (PO2) or used external assistance, for example, use of a mirror to provide feedback to the patient enabling the accuracy of the exercise to be developed (PO3).

Precision was also identified as important through the feedback provided to students.

"Handling skills lacking precision and localisation". (PO3)

"Excellent handling and sensitivity". (PO4)

4.2.3.3.5 Adaptability

Adaptability was illustrated through a student's flexibility based upon the information they gathered. For example adapting an exercise based upon their observation of a patient's ability to perform the exercise (PO2), or changing their approach.

"I need to give you another exercise as that one is quite difficult at present ". (PO3)

This was also reflected through examiners' comments.

"Very good adaptability in thoughts and practical skills". (PO4)

Adaptability encompassed both cognitive and practical dimensions, although the greatest emphasis was on cognitive functioning.

4.2.3.3.6 Critical approach to practice

This was highlighted through the examiners' articulation of a critical approach to practice as an aim of their discussion with the student, in seeking,

"........ critical reasoning". (PO1)

The nature of the questions to students also highlighted the demand for criticality in that they were continually asked to 'explore' 'discuss' 'analyse', aided by the use of prompts to gain further depth from the student.

"It is interesting that she has some latency to her problem - what do you think of that?" (PO2)

An emphasis on critical understanding was also reflected through feedback, in this example negative feedback.

"Tended to take academic understanding out of context". (PO5)

4.2.3.3.7 Knowledge

Breadth of propositional knowledge

In asking the students to support their decisions, aspects and breadth of propositional knowledge were explored. For example requesting anatomical and

biomechanical knowledge to support the technique selected (PO4).

Propositional knowledge was not explored as much as the other forms of knowledge, although if the examiners felt that there were any gaps in the propositional knowledge, these were explored through more specific questions.

"What is central sensitisation?" (PO1)

Evidence informed knowledge

The research evidence behind a decision was also explored as a component of propositional knowledge.

"What is the evidence to support use of the balance test?" (PO2)

Use of evidence was also reflected through feedback.

"Has backing of literature and understanding of it. Applied literature to patient to support progression." (PO2)

Effective use of process knowledge

Process knowledge was also explored, although this was essentially implicit through the integration of procedures, tests and analysis of their findings. Some questions were specifically designed to elicit aspects of process knowledge, for example, exploring why a technique was done in a particular way (PO3).

Effective use of personal knowledge

Personal knowledge again was not usually explored explicitly but had been observed throughout the interaction with the patient, as well as during the discussion stages. Greatest emphasis was on this form of knowledge as evidenced throughout the evaluation of a student's clinical reasoning and their justification of decision-making that was linked to prior experiences. In some

situations personal knowledge was explored directly, for example, a student

was asked about how pathology linked to prognosis based upon their previous

experience (PO2).

Integration of all forms of knowledge

The integration of all forms of knowledge was also evident through the students'

actions and their discussion of a patient's problems. For example in being asked

to justify a position for a particular technique, students commonly drew on all

forms of knowledge (PO1). The expectation of integration was also illustrated

through feedback.

> *"Student lacked insight into the effect of the different contributing*
>
> *factors". (PO5)*

Integration of all forms of knowledge was explored explicitly through wide

questions that were linked to the observation, for example,

> *"What about alternative means of treatment?" (PO6)*

4.2.3.3.8 Self-analysis

Students were encouraged to analyse their performance, for example in

recognising the limitations of what they had done. This was illustrated in

particular through the feedback to students.

> *"Good self-analysis of areas of limitations and recognition of ideas of*
>
> *improving, for example, combined movements - good idea but lost*
>
> *localisation". (PO1)*

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The examiners also gave the students the opportunity to identify areas where they needed to collect further data at subsequent visits (PO6), encouraging self-analysis.

4.2.4 Triangulation of data from case study

The data from the interviews and observations are collated into Table 4.16 in the order of importance perceived by the researcher from the overall findings. The findings illustrate good agreement for most components of the construct and good agreement for the order of importance of the components.

Table 4.16: Triangulation of data from the case study

Component of construct[8] (in bold) and subcomponents (most important first)	IS	ICT	PO
High level of clinical reasoning	√	√	√
Abandonment of routine and prescription	√	√	
High level of identification of cues		√	
Specificity in identifying problem	√		√
Prioritisation	√	√	√
Integration of different forms of information	√		
Lateral thinking		√	
Ability to deal with multiple issues at once		√	
Use of hypothetico-deductive model	√	√	
Use of pattern recognition model	√	√	
Ongoing process of reasoning		√	√
Ongoing process of evaluation	√		√
Diagnostic reasoning	√		√
High level of background knowledge	√	√	√
Breadth of propositional knowledge	√		√
Effective use of personal knowledge	√	√	√
Evidence informed knowledge	√	√	√
Integration of knowledge and practice		√	
Effective use of process knowledge			√
Integration of all forms of knowledge			√
Justification of decisions	√	√	√
High level of psychomotor skills	√	√	√
High level of precision of skills	√	√	√
Adaptability of skills	√	√	
Quality / reliability of information gained	√		
Broad repertoire of skills	√	√	
Patient-centred approach	√	√	√
Adaptability	√	√	√
Critical approach to practice	√	√	√
High level of self-analysis	√	√	√
Creative practice	√	√	
High level of confidence	√	√	
Critical analysis of evidence to inform practice	√		
Continuing professional development		√	

[8] Terminology reflects the most commonly used wording

4.3   Convergence of data across Delphi study and case study

The components of the construct from the Delphi and the case study are

collated in Table 4.17 to facilitate comparison. The components of each study

are detailed in order of importance for their study. The greater depth gained by

the case study, emphasising the subcomponents to some components of the

construct is also highlighted.

Table 4.17: Convergence of findings across the Delphi and case study

Component of the construct from the Delphi study In order of median ranking from round 3 (most important first)	Component of the construct from the case study In perceived order of importance (most important first)
High level of clinical reasoning skills	**High level of clinical reasoning**
Critical analysis in approach to practice	▪ Abandonment of routine and prescription ▪ High level of identification of cues
Critical use of evidence to inform practice	▪ Specificity in identifying problem ▪ Prioritisation
High level of clinical skills	▪ Integration of different forms of information
Advanced knowledge of subject area	▪ Lateral thinking ▪ Ability to deal with multiple issues at once
High level of decision-making skills	▪ Use of hypothetico-deductive model
High level of reflective practice	▪ Use of pattern recognition model
Synthesis of materials from a variety of sources	▪ Ongoing process of reasoning ▪ Ongoing process of evaluation
Advanced problem solving	▪ Diagnostic reasoning
Analysis of concepts / arguments	

High level of communication skills

High level of self-evaluation and identification of learning needs

Adaptability of approach to new situations

Autonomous / independent practice

Justification of examination procedures

Motivation to advance knowledge

Independent learning ability

High level of skill in communicating information

Evaluation and audit of clinical practice

Creativity and innovation of practice

High level of background knowledge

- Breadth of propositional knowledge
- Effective use of personal knowledge
- Evidence informed knowledge
- Integration of knowledge and practice
- Effective use of process knowledge
- Integration of all forms of knowledge

Justification of decisions

High level of psychomotor skills
- High level of precision of skills
- Adaptability of skills
- Quality / reliability of information gained
- Broad repertoire of skills

Patient-centred approach

Adaptability

Critical approach to practice

High level of self-analysis

Creative practice

High level of confidence

Critical analysis of evidence to inform practice

Continuing professional development

Table 4.17 illustrates good agreement and therefore convergence of the Delphi

and case study findings for some aspects of the construct as highlighted in bold.

5.   DISCUSSION

5.1   Discussion of the Delphi study

By the very nature of Delphi and case study as methods, some analyses of the findings are detailed in the previous section to justify decision-making and interpretation. The nature of this study in exploring the components of the construct of Masters level clinical practice necessitates a detailed analysis of the findings. This chapter will therefore provide a detailed analysis of the findings from the Delphi, case study and the convergence of the two methods. The limitations of the study are considered within each section.

5.1.1. Response rate

The response rate of 79.1%, 77.1% and 70.8% for rounds 1–3 respectively, can be described as acceptable (Walker and Selfe, 1996), and very good (Babbie, 1990; Mangione, 1998). This is comparable to other Delphi studies (Cross, 1999), particularly as the literature has documented the problematic reduction in response rate as a Delphi study extends to several rounds (Reid, 1993). The acceptable response rate for a Delphi study is therefore less than for a survey questionnaire as the demands placed on participants in asking them to commit to a series of rounds will inevitably influence their decision to participate. It is however problematic to justify the degree of satisfaction with a response rate, as there is no published minimum response rate that is supported statistically. In contrast, the Delphi approach has been described as highly motivating for participants, owing to its iterative process and feedback (Pill, 1971), and

particularly through the direct interests of the participants in the findings to inform their own work. This was supported by all participants of round 3 requesting an abstract of the study upon completion, and may have assisted the achieved response rate. Although most participants were lost from the radiography group, there was still good representation of this group within the final round sample. This is consonant with Williams and Webb (1994) suggestion of monitoring to ensure that a range of opinion is represented even if the sample size falls.

A high response rate does not however ensure the representativeness of the sample (Krosnick, 1999), as even a small number of non-respondents can introduce bias if they differ systematically from the participants (Moser and Kalton, 1971). All non-respondents were followed up, and their reasons for being unable to participate appeared unconnected to the research, suggesting that there was no confounding bias (Oppenheim, 1992). However, for one participant withdrawing in round 3 the reason stated was that the task was too difficult, which could have introduced bias. This possibility was balanced against a good range of opinion being maintained overall within the radiography group.

The attrition rate for this study was therefore 29.2% of the sample and 10.5% from the actual panel. This attrition rate is low compared to other studies (White, 1991; Williams and Webb, 1994) and the panel of experts for this study can therefore be described as stable. This stability further supports the decision to permit the data to decide consensus for the round 2 and 3 findings (Sections 4.1.2.4; 4.1.3.3). Through the overall sampling strategy and achieved response rate, it can therefore be concluded that the participants of the Delphi study were

a representative sample of the target population, therefore affording good external validity and enabling confidence in the generalisability of findings. The issue of internal validity centred on the accurate completion of the questionnaire. It was however, beyond the scope of this study to explore this further (for example through interviews), and as a postal questionnaire through its anonymity tends to facilitate greater honesty (Cohen et al, 2000), this was taken as adequate.

5.1.2 Round 1 findings

In round 1, the 28 behaviours defined as indicative of the construct of Masters level clinical practice by the course tutors demonstrated consensus (Table 4.2), with 5 behaviours demonstrating good consensus, and 3 behaviours demonstrating very good consensus. The phraseology of behaviours was variable across the participants. This was anticipated as potentially problematic owing to professional differences in terminology encountered previously (Rushton, 2002). Phraseology was raised by some participants, although their comments illustrated their difficulty with the educational terminology of behaviour / attribute / outcome rather than the terminology associated with the actual behaviours.

Most participants found the task easy as reflected in the range of 7 - 20 behaviours provided, with 25 participants providing > 10 behaviours. From their responses, documented outcomes for programmes or clinical assessment schedules were commonly used as the basis for the behaviours provided. In contrast, those participants who found the task difficult essentially found it

challenging. This was evident through their comments suggesting documentation did not address the issue of clinical practice directly, and this necessitated giving the list considerable thought. The deficit of articulation of the behaviours was anticipated from previous work exploring Masters courses (Atkins and Redley, 1998), and is also consistent with the healthcare literature on Masters level with limited evidence supporting the clinical component of the construct (Davis and Burnard, 1992; Gerrish et al, 2000; Whyte et al, 2000). It is therefore interesting that the behaviours achieving very good consensus were centred on use of evidence and critical analysis that are synonymous with the QAA descriptor (2001a). In addition, clinical reasoning also achieved very good consensus, perhaps reflecting its current profile within healthcare (Higgs and Jones, 2000). The analytic categories developed from *additional comments* highlighted the difficulty of distinguishing or measuring Masters level, providing further justification for the research question and illustrating how the issues highlighted by the researcher are widespread.

5.1.3 Round 2 findings

The unimodal and negatively skewed data illustrated the content validity of the behaviours from round 1. The data were skewed owing to the high ratings from the participants for most of the behaviours as important to the construct. In addition, content validity was supported through no new behaviours being added in round 2. Achieving content validity therefore confirmed the decision-making at the end of round 1.

Consensus between participants was good for most behaviours (Table 4.4, Figure 4.1). Some behaviours were however less important to the construct as reflected by lower means. These behaviours also demonstrated higher CVs illustrating a lack of consensus, suggesting that differences exist between participants' ratings for some behaviours. Kendall's W however, demonstrated significant agreement between all participants on their ratings, as did the same test on the physiotherapy and radiography groups separately. This was further supported by the Spearman's rho analysis that found significant agreement across the physiotherapy and radiography groups. The lower means and greater CVs could therefore not be explained by low consensus overall, supporting a lack of consensus and lower importance of some behaviours that were consequently removed for round 3.

Some participants suggested that the behaviours were difficult to evaluate without some prioritisation of their importance, supporting the ranking procedure used in round 3. In contrast other comments from the participants emphasised the difficulty of differentiating the importance of the behaviours, suggesting that the process of ranking would be a difficult task.

No response from 59.5% of the participants when asked about phraseology suggested that there were few issues overall. The issue of phraseology relating to level was however described as problematic, particularly in differentiating 'high level' and 'advanced', as experienced by the researcher in round 1. One participant defined Masters level as different to expert practice, and therefore felt that descriptions of 'high level' were problematic. This was however in contrast to the overall comments from participants and the conclusions from the

literature review that support Masters level as being implicitly linked to expert

practice (Donaghy and Gosling, 1999; Raja-Jones, 2002). The participant who

raised this point subsequently went on to assert that Masters level can equate

to expert practice, similarly to the analysis by Donaghy and Gosling (1999), but

that it may not always equate (Interprofessional 2, quotation). Boundaries were

an important issue raised by the participants, through the differentiation of

Masters level in the continuum of academic levels, and also in the continuum of

expert practice (Figure 2.3). These comments supported the dilemmas

highlighted within the literature review.

5.1.4 Round 3 findings

The process of ranking distinguished behaviours as important or less important

to the construct (Table 4.7). Consensus was observed for some behaviours in

distinguishing them as high, medium or low ranking (Table 4.7, Figure 4.2,

Table 4.8) through use of the median scores and interquartile ranges. For this

round there were however, some obvious differences in the responses from

participants. This was reflected in the frequency of a bimodal distribution for 9

behaviours, and the variability of ranking suggested by some large interquartile

ranges.

The behaviours illustrating consensus and high ranking (Table 4.8) are the

behaviours identified by most participants from round 1. This suggests strongly

held beliefs regarding these behaviours, as opinions have not been modified

throughout the subsequent rounds. Interestingly, the order of importance of the

behaviours has changed from round 1 to emphasise clinical reasoning as the

most important behaviour to the construct, suggesting that further consideration of this behaviour prioritised it further.

Consensus of the high and middle ranked behaviours (Table 4.8) adds further support to the content validity of the behaviours included, while the consensus regarding the low importance of one behaviour justified its removal. In contrast, no other behaviour demonstrated consensus of low importance, further supporting the content validity of the resulting 20 behaviours.

In contrast to the lack of consensus of some behaviours, Kendall's W demonstrated significant agreement across participants overall on their rankings, as did the same analysis for the physiotherapy and radiography groups separately. Interestingly, the lower interquartile ranges for most behaviours in Figures 4.3 and 4.4 for the physiotherapy and radiography groups compared to Figure 4.2 across participants overall, suggested greater consensus within the professions compared to across participants overall. This perhaps highlights a limitation of the statistical analysis as explored later, in particular as Table 4.9 suggested different rankings of the importance of the behaviours by the two groups, which was further supported by Spearman's rho that found no significant agreement across the physiotherapy and radiography groups. In contrast to Kendall's W across participants overall, the findings therefore suggested that there were differences between the two professions in the ranking of the behaviours. However, as the content validity of the behaviours was good, it suggests that this is an issue of ranking rather than inclusion. This supports the notion that differences across professions are

important to the prioritisation of behaviours, but not the content of the behaviours within the construct.

The comments regarding the process of ranking highlighted a key limitation of the Delphi study. As anticipated within the methodology the process of ranking 21 behaviours was problematic, although few comments on the process of ranking linked to the number of behaviours included. All participants found the process difficult, linked to the inherent difficulty in the interpretation of the construct as anticipated from the literature review, and this was supported by participants describing the process of ranking as thought provoking and developing their understanding. Some participants wanted to give some or all of the behaviours equal weighting of importance and suggested that the process perhaps forced a hierarchy that participants did not feel existed (Converse and Presser, 1994). In addition, a few participants perceived some of the behaviours as similar, although this issue had not been raised in round 2. The comments overall therefore did suggest some forcing of ranking had probably occurred. There is minimal literature to support the reliability of the Delphi method (Williams and Webb, 1994), and the responses from some participants on the issue of ranking suggested that intra-rater reliability of participants might be problematic. The existing literature also suggested difficulty in ranking items in the middle of the order (Sudman and Bradburn, 1982). This was however not reflected in this study as illustrated by the consensus achieved for middle ranked behaviours (Table 4.8), compared to high or low ranked behaviours. In linking to the suggestion from the literature that clinical speciality may influence the components of the construct (May and Dennis, 1991), some participants did suggest that they would rank differently depending upon speciality.

In exploring the relationship between Masters level and the grading structure within clinical practice, most participants perceived Masters level as comparable to specialist / advanced clinical roles. Different terminology reflected the structures across the professions, but all participants were in agreement in reflecting an advanced level of clinical practice. The responses were also characterised by an acknowledgement that similarly to the findings of the literature review, this level of practice remains under recognised. This was accompanied by a hope that continued modernisation of the NHS would assist recognition. The quotations from the participants on this issue therefore reinforced the comparability of the concepts of specialist practice, Masters level and expert clinical practice, as supported by the literature review. However one participant insightfully raised the confounding issue of experience (Interprofessional 2, quotation), suggesting the anomaly of expertise without clinical experience in a practitioner who may have little clinical experience but may study successfully at Masters level. However, for Masters degrees focused on developing clinical expertise, clinical experience is required as a pre-requisite to enable development, supporting the link to level of specialist (anecdotal experience).

Other comments from the final round of the Delphi support the necessity for this research in developing further guidance for Masters level courses, and the establishment of criteria for assessment of practice at this level. The comments also highlight the equivalent importance of exploring Doctoral level clinical practice, and this was explicitly linked to the new and developing Consultant role.

5.1.5 Discussion of behaviours

The analysis above highlights the consensus for the content of the behaviours but at the same time emphasises differences in the prioritisation of the behaviours across professions. The large number of behaviours described emphasises the high expectations of Masters courses, and links to 'fitness for purpose' for advanced clinical roles.

Consensus across participants overall emphasised the greatest importance of a 'high level of clinical reasoning' to the construct (Table 4.8). As discussed in the literature review, the QAA (2001a) descriptor does not address issues of direct relevance to clinical practice, so clinical reasoning is not encompassed. However, the descriptions of dealing with complex situations systematically and imaginatively and making judgements in the absence of complete data, link broadly to the process of clinical reasoning in highlighting complex cognitive processes. The empirical studies in healthcare to date have also not defined clinical reasoning (Table 2.2).

In contrast to clinical reasoning, the behaviours of 'critical analysis in approach to practice', and 'critical use of evidence to inform practice', are strongly represented within the QAA (2001a) descriptor, through evaluating current research and methodologies, enabling conceptual understanding to inform practice. This highlights the transferability of the descriptor into the clinical environment for these behaviours. A critical attitude and approach was also identified as important through the empirical studies in healthcare (Davis and Burnard, 1992; Gerrish et al, 2000; Whyte et al, 2000), as was the centrality of

research to practice, although the context was different to the findings of this study. The context centred on developing an awareness of research (Whyte et al, 2000), developing competence in research methods (Davis and Burnard, 1992), and undertaking research and implementing it in practice (Davis and Burnard, 1992), emphasising active involvement in research rather than the emphasis on research (evidence) to inform practice in this study. The difference in emphasis can perhaps be explained through the increasing attention to EBP in healthcare in recent years (Bury, 1998), and in particular evidence informing decision-making in practice.

In looking at the behaviours across the different professions (Table 4.9), it is interesting to note that clinical reasoning was perceived as more important to physiotherapy compared to radiography, although both groups achieved consensus regarding its high importance. Critical analysis was seen as high importance to physiotherapy, but consensus was not achieved for radiography, and likewise critical use of evidence achieved consensus for both, but was a high ranked behaviour to radiography, and perceived as a middle ranked behaviour for physiotherapy. This variation emphasises professional differences on these issues that are illustrated in particular through the differences in working between these two professions, with physiotherapists having worked autonomously for 20 years and therefore emphasising reasoning and critical analysis, and for the radiographers working within an interprofessional framework with less freedom for autonomous practice (QAA, 2001b) these were less important. This was further supported by the radiographers' consensus on clinical skills as the most important behaviour, linking to their primary role in carrying out examination procedures requiring a high level of skill, whereas for

physiotherapy consensus was not achieved for the importance of clinical skills

within the construct. This is perhaps surprising considering the value placed

historically on skills within the profession (Caney, 1983) but may also reflect

skills being encompassed by knowledge or clinical reasoning. Clinical skills are

explicitly emphasised by QAA (2001a) through the development of new skills at

a high level, again emphasising the applicability of the descriptor to the context

of practice. Clinical skills have not been encompassed by the empirical studies

to date (Table 2.2).

The concept of analysis highlighted throughout the QAA descriptor (2001a) was

also evident in the consensus achieved for the behaviour centred on the

analysis of concepts / arguments as a middle ranked behaviour for participants

overall and radiography, and as a high ranked behaviour for physiotherapy. This

does however highlight a limitation of the Delphi findings, as it can be argued

that there is considerable overlap between this behaviour and that of critical

approach to practice, supporting comments from some participants. This may

be a particular issue from round 2 that requested consideration of the

behaviours individually and therefore similarities were perhaps not identified.

Likewise, similar behaviours to clinical reasoning were described, including

'advanced problem solving' which was argued as synonymous with clinical

reasoning in the literature review, and 'high level of decision-making skills'. The

consensus of problem solving as a middle ranked behaviour for participants

overall and the consensus of decision-making by both physiotherapy and

radiography groups as a middle ranked behaviour therefore adds further

support to the emphasis on clinical reasoning.

The QAA descriptor (2001a) places great emphasis on knowledge through its development and critical application, and it is interesting to note the Delphi finding of 'advanced knowledge of subject area' as the 5th ranked behaviour and not achieving consensus for participants overall (Table 4.8), although achieving consensus as a high ranked behaviour for radiography, and a middle ranked behaviour for physiotherapy (Table 4.9). Another behaviour centred on the 'motivation to advance knowledge' achieved consensus as a middle ranked behaviour by participants overall and middle ranked by physiotherapy compared to a low ranked behaviour for radiography, although interestingly this behaviour is reflected in the QAA descriptor (2001a). Knowledge was also perceived as important from the empirical work in healthcare although there were differences in opinion as to how knowledge was advanced. Davis and Burnard (1992) described knowledge as narrowing and deepening that would be consonant with advancing knowledge in a particular specialist area. In contrast Gerrish et al (2000) described knowledge as deepening but also broadening. It is difficult to relate the Delphi findings more specifically to the literature as further detail of 'advanced knowledge' cannot be gained.

Personal characteristics of a 'high level of self-evaluation and identification of learning needs', 'independent learning ability' and the flexibility of an individual's approach in their 'adaptability of approach to new situations' achieved consensus across participants overall and consensus for physiotherapy as a middle ranked behaviour. In addition adaptability was agreed as a middle ranked behaviour for radiography, and independent learning as a low ranked behaviour. These behaviours were highlighted from the literature regarding expertise through self-awareness and a commitment to continuing education

(Table 2.6, xix, xxvi), although adaptability was not emphasised directly. In addition, independent learning ability is explicit within the QAA descriptor (2001a).

Other high / middle ranked behaviours by participants overall, but not achieving consensus encompassed 'high level of reflective practice', 'synthesis of materials from a variety of sources', 'high level of communication skills' and 'autonomous practice'. Working autonomously is emphasised within the QAA descriptor (2001a), and was emphasised by the empirical work of Davis and Burnard (1992). Reflective practice and synthesis of knowledge are also reflected in the wider literature (Table 2.6, ix, xi, xii).

Other low ranked behaviours by participants overall, although not achieving consensus encompassed 'justification of examination procedures', 'high level of communication skills', 'high level of skill in communicating conclusions', 'evaluation and audit of clinical practice', and 'creativity and innovation of practice'. Consensus of lower ranking was however achieved by the physiotherapy group for 'justification of examination procedures'. Creativity and innovation are reflected in the QAA descriptor (2001a) through originality in solving problems, and creativity was a key theme from the empirical work in healthcare (Davis and Burnard, 1992; Gerrish et al, 2000). Communication of conclusions to specialist and non-specialist audiences is also a component of the QAA descriptor (2001a).

As the QAA descriptor (2001a) is now used to inform course design it is logical that its characteristics are reflected in the Delphi findings, and all aspects were

encompassed. Some aspects of the descriptor were however less developed through the behaviours, for example, the emphasis on the complexity of problems and being able to manage them effectively. In addition, one aspect of the empirical work to date within healthcare was not reflected in the behaviours, that of increasing confidence in assessing complex situations (Whyte et al, 2000).

In comparing the behaviours to the existing literature regarding expertise, the contrast is interesting. The literature review found greatest emphasis on the organisation of knowledge (Table 2.6, i), which may be explicit through the phraseology of 'advanced knowledge' but was not seen as the highest priority from the Delphi findings. Pattern recognition as an approach within clinical reasoning was the next characteristic of expert practice described within the literature (Table 2.6, ii). This is again perhaps implicit within the Delphi findings through the emphasis on clinical reasoning, but also highlights a limitation of the Delphi in not providing the detail to explore clinical reasoning further. Many other characteristics of expertise described in the literature are not reflected in the behaviours detailed, for example speed of cognitive ability, prioritisation of data, and a patient-centred approach (Table 2.6, iv, vi, viii). This may be explained by a lack of awareness of the existing literature that is also supported through the contrast of the literature to the empirical studies of Masters level in healthcare. As illustrated by the above discussion, the behaviours identified by the Delphi are broad in their scope and have therefore been linked to the existing literature in general rather than specific terms.

5.1.6 Limitations of the Delphi study

Some limitations to this research were accepted in its design and implementation and were therefore considered within the methodology section. Several limitations to the Delphi approach have also been detailed in the above analysis. Use of a total population sample avoided any bias within the selection of the panel. However, the expertise and experience of course tutors cannot be assumed, as some tutors may be new to this role and managing Masters courses for the first time.

As discussed in the methodology, the definition of consensus is problematic (Williams and Webb, 1994; Powell, 2003). Some decisions regarding consensus were made following the analysis of the data as justified in the methodology. However, a criticism of this approach is that the level of consensus is arbitrary, and the study's quality problematic as the methods cannot be repeated. This is an example of how the researcher can exert bias on the findings and conclusions, and therefore justified the use of the independent researcher for blind analysis of the first two rounds. The decision-making for consensus is also justified through the stability of responses observed throughout subsequent rounds (Duffield, 1993).

Another key criticism levelled at the Delphi approach is through its alleged analysis of anecdotal comments, a claim that is refuted by Maxwell (1995) who contends that an informed expert panel derived from the real world generates data that are both realistic and have face validity. Another limitation described within the literature is that the researcher does not have access to decision-

making to assist in the analysis of the findings (Walker and Selfe, 1996). Although not addressing this issue entirely, the use of open questions in providing qualitative data was useful in affording some insight into these processes.

Non-parametric analysis of the quantitative data was employed, as the requirements for parametric analysis were not achieved, with implications for power (the ability of a test to identify a relationship where one exists). In addition, the inferential tests possessed their own limitations as Kendall's W and Spearman's rho do not provide information about any agreement in actual scores, a limitation in particular with the data being argued as interval level for this study. The tests also do not provide information regarding the correctness of the ordering if true ordering exists (Sim and Wright, 2000). Both tests will also have been affected by the negative skew of the data in round 2. However, in combination with the descriptive analysis, the inferential tests were useful in exploring the data.

Other limitations include the possible speed of completion of questionnaires by participants without full consideration affecting reliability, and the negative skew of the round 2 data forcing high scores and perhaps inhibiting differentiation. These limitations further support the need for convergence with the case study data.

5.2   Discussion of the case study

5.2.1   Interviews with students

The range of experience since qualification, from 4 – 9 years, was interesting in the context of deliberate practice / experience, where it has been suggested that 5 years (Benner, 1984) or 10 years (Simon, 1980) of experience is required to develop expertise. The mean of 6.3 years therefore suggests that most students would be within Benner's classification of expert. However, as the literature review highlighted (Schon, 1983; Benner, 1984) it is the quality of the experience that is important, and from the background information throughout the interviews, the students were seeking quality experience through the Masters course, suggesting that they had not achieved what they needed from their clinical experience to date.

Students were interviewed from the fulltime and part-time routes, and throughout their first and second placements to ensure no bias was introduced through omission of any particular characteristic of the context. However, their responses were very similar across the different characteristics and there was conformity of strategies used to assist learning on the placement that were centred on observation and discussion of their performance.

The students placed greatest emphasis on knowledge throughout the interviews (Table 4.10), and in particular propositional knowledge in providing breadth to the specialist area. This was however in contrast to the emphasis being placed on clinical reasoning and a variety of other issues when asked specifically to

prioritise what they discussed (Table 4.11). The emphasis on knowledge may reflect their work at the time of being on placement, which appeared to involve evenings of reading texts and research articles to support their practice during the day. Several students also moved towards an integration of all components as the priority for practice at this level, and this may have been an evolution of ideas developed in the interview as most students developed their initial ideas considerably throughout the course of the interview.

5.2.2 Interviews with Clinical tutors

Saturation was achieved earlier for the clinical tutors compared to the students, perhaps as they were more informed through the process of student examination regarding the construct. This is supported through their range of 0 - 23 years and mean of 6.3 years of experience of taking students on placement. The clinical tutors placed greatest emphasis on clinical reasoning throughout the interviews (Table 4.12), and this was also prioritised as the most important component of the construct for most tutors following a direct question (Table 4.13).

5.2.3 Participant observation

Through the participant observation of 7 examinations consisting of 5 different stages (Table 4.14), clinical reasoning again emerged as the most important component of the construct. Early saturation of data was achieved, probably owing to university guidelines detailing the aims of the process and the assessment criteria. It was interesting however, that the same components of

the construct were explored throughout both forms of examination. The assessment of a new patient and the management of a returning patient can therefore be seen as involving similar processes for the student, which is supported by the recent attention to management in the clinical reasoning literature (Mattingly, 1991; Jones, 1992).

Observation of the examination process highlighted its similarity to the post hoc methodology used in the clinical reasoning research to gain retrospective understanding of a student's thinking (Elstein et al, 1978). The ability of such a procedure to access organisation of knowledge and ongoing decision-making is however an assumption as discussed in the literature review, as it relies on the reflections on the case which will have been influenced by the whole patient encounter as well as any interaction with the examiners in this situation.

For the participant observations the importance of knowledge was low compared to other characteristics, with the greatest emphasis distinctly on the processes of clinical reasoning with clearly defined subcomponents (Table 4.15). Intricately linked with clinical reasoning was the ability of students to justify all of their decisions, and through the ability of the students to justify, an evaluation of the level of their reasoning was established.

5.2.4 Quality of qualitative data and analysis

Credibility of this study is achieved through the explicit derivation of each analytic category from the data as illustrated throughout the findings and through triangulation (Lincoln and Guba, 1985) with the findings across

methods, to ensure that all conclusions are firmly grounded in the data. A central issue for credibility and a major criticism of qualitative research is researcher bias (Mays and Pope, 1995). A key consideration is the researcher acting as a research instrument throughout processes of data collection and analysis (Andrews et al, 1996), and again this has been made explicit. The presuppositions bought to the study as discussed in the methodology were accurate, for example the positivistic origins of the researcher. Koch (1994) describes the enhancement of credibility when a researcher articulates and interprets their experience as the researcher demonstrating self-awareness. This was achieved for this study through a notebook that documented any key issues occurring throughout the research process and monitoring of any positivistic influences. The counter argument to potential researcher bias is that the researcher's insight into the speciality, situations and assessment process enabled a dimension to the analysis that was advantageous to the findings. Without this insight the analysis would lack some of the quality it has achieved. An example of this is the issue of prioritisation that was described and demonstrated in a variety of ways by participants. Without insight this issue would not have been detected across the participants.

With participant observation in particular, the fusion of roles of researcher and participant were inevitable. For most observations this was through an awareness of the researcher influencing practice, for example,

> "The discussion between the examiners about the student's performance appeared to take an extraordinary amount of time. This appeared to be related to my presence and the need to demonstrate a fully considered process of arriving at a grade". (Researcher notes, PO1)

As noted in the methodology, a difficulty of acceptance as a researcher can be an expectation to reciprocate the favour (Pope and Mays, 2000b). Few issues arose, but one potentially problematic situation occurred during the observation of an examination where there was some conflict in the opinions of the two examiners.

> *"The student had demonstrated limited justification of his actions throughout the examination. This was the view taken by the external examiner, but the clinical tutor disagreed and felt that the student had performed to a good level. Following a discussion that did not move either examiner's position, they turned to me for my opinion. I explained that I was unable to give an opinion as I was there as an observer only, and also the emphasis of my observation was not on the evaluation of performance". (Researcher notes, PO5)*

Feedback from the participants through the 'any other comments?' section of the participant checking process did not highlight any other issues. This and the effective saturation of data for all components of the case study assisted in the credibility of the data. Credibility was also enhanced through the avoidance of error. Barriball and While (1994) highlight the potential error developed from non-response, where similarly to the Delphi questionnaire discussed above, bias can be introduced. This was avoided through the inclusion of all characteristics of the context discussed above, encompassing varying degrees of experience for all participants. In addition, all participants invited to participate were happy to do so. The use of face-to-face interviews also afforded the opportunity to evaluate the credibility of the participants' responses through the observation of non-verbal communication (Gordon, 1975). The use of interview

also ensured that the response was from the participant only, without collaboration with others (Bailey, 1987).

A limitation however to establishing credibility was the inability to explore the findings through negative case analysis as no inconsistencies were identified in the data (Silverman, 1993). Dependability and confirmability were achieved through all processes of the case study being written to communicate the decision trail with clarity. In relating to the applicability of findings to a different context, transferability is therefore dependent upon similarity between contexts (Lincoln and Guba, 1985). The context of this study was therefore articulated fully within the methodology to enable readers to formulate a judgement of transferability. It can therefore be concluded that the case study has demonstrated trustworthiness to ensure its rigour, enabling confidence in its findings through consideration of credibility, dependability, confirmability and transferability.

5.2.5   Findings of triangulation of interviews and observations

5.2.5.1   Specificity of components

In contrast to the Delphi study, the components of the construct defined from the case study are specific in their scope, also identifying subcomponents. The different methods therefore produced confirmation of key issues as well as different insights into the same issue (Silverman, 1993). This enables comparison to the existing literature in greater detail.

5.2.5.2 Expertise

There is a clear link from the findings of the case study to the existing literature regarding expertise. The emphasis on clinical reasoning as the key component of the construct reflects the first generation of thinking regarding expertise (Jensen et al, 2000) that emphasises the individual's reasoning strategies that are employed to solve problems. In addition, the emphasis on the hypothetico-deductive model of reasoning that also characterised this generation can be seen throughout (Elstein et al, 1978). This suggests that the evolution of the second generation's emphasis on the organisation of domain specific knowledge has not been fully developed into practice within this speciality of manipulative physiotherapy, although knowledge was perceived as the second most important component. This may be due to the influence of specific research within physiotherapy that is focused to this speciality and also the hypothetico-deductive model of reasoning, perhaps influencing current thinking (Payton, 1985; Thomas-Edding, 1987; Jones, 1992; Rivett, 1995; Rivett and Higgs, 1997; Higgs and Jones, 2000).

The period of clinical placement was seen by all participants as providing an intense period of deliberate practice to assist development of expertise, recognising the contribution that working in the authentic context makes (Schon, 1983; Benner, 1984). This also supports the assertion regarding the quality of deliberate practice as essential to development (Benner, 1984; Rossano, 2003), with a Masters level placement being an intensive period of deliberate practice. Several authors have highlighted the evaluative and reflective use of experience as important (Boyd and Fales, 1983; Schon, 1983; Kolb, 1984), and this was

illustrated in the findings of the case study with recognition of the component of

'high level of self-analysis'. The review of the literature explored Schon's (1983)

concept of reflection-in-action as characterising expertise and this was

illustrated through 'high level of self-analysis', and the constant cognitive

functioning required for the component of 'adaptability' and the subcomponents

of 'prioritisation', 'lateral thinking', 'ability to deal with multiple issues at once',

'ongoing process of reasoning', 'ongoing process of evaluation' and 'adaptability

of skills', where the ability to reflect-in-action is implicit. This therefore suggests

that Schon's call (1987) for educational programmes to focus on this capability

has been achieved, certainly for this course. Carr and Kemmis (1986)

articulated this as the process of developing informal theory through reflection-

in-action, and this was evident through the components of the construct as

highlighted above, but also in particular through the participant observation,

where the post hoc protocol elicited description of the informal theories

developed throughout the patient encounter. Chi et al (1981) found that experts

were more aware of any errors that they made, again linking to the component

of 'high level of self-analysis' assisting the recognition of personal limitations. In

addition, Jensen et al (2000) observed effective metacognitive skills in experts,

further supporting self-analysis.

5.2.5.3   Clinical reasoning

The emphasis of the research exploring clinical reasoning has perhaps

influenced the case study's focus on diagnostic reasoning (Elstein et al, 1978;

Feltovich and Barrows, 1984). The literature within physiotherapy supports this,

through an early application of the medical work following identification of the

hypothetico-deductive model in physiotherapy practice (Payton, 1985; Thomas-Edding, 1987). Other authors, particularly within the speciality of manipulative physiotherapy have subsequently developed this further (Higgs, 1990; 1992; Jones, 1992; Higgs and Jones, 2000), and as discussed in the literature review the hypothetico-deductive model has been the basis of undergraduate education for a number of years. It was interesting however that the participant observation did not present explicit evidence of this model of reasoning, although the model was implicit through the emphasis on diagnosis and the descriptions of informal theory. The identified subcomponents of clinical reasoning reflect stages of Elstein's model in 'high level of identification of cues' and the 'specificity in identifying problem', through the 'use of the hypothetico-deductive model'. All of these subcomponents are therefore reflected in the empirical literature as is 'prioritisation' (Table 2.6, vi, vii, xiii, xvii). The quality of the formed hypotheses has been identified as influencing correct diagnosis and management (Norman et al, 1982), and quality was explored throughout the case study through the justification of decisions made, which was an important identified component of the construct across all aspects of the case study.

The case study also demonstrated evidence of clinical reasoning and in particular the hypothetico-deductive model throughout patient management as well as assessment, characterised by the subcomponents of 'ongoing process of reasoning' and 'ongoing process of evaluation', to inform continuous decision-making. This lends support to the findings of other authors and perhaps suggests a new area of attention for researchers (Roberts, 1996; Doody and McAteer, 2002). The literature suggests differences between professions and specialities for clinical reasoning, for example the

phenomenological approach described for occupational therapy (Mattingly, 1991), and active and passive approaches to assessment within physiotherapy (May and Dennis, 1991). While the case study is therefore illuminating for manipulative physiotherapy, the findings cannot necessarily be generalised to other specialities / professions. Other subcomponents of clinical reasoning defined within the case study were not reflected within the literature directly, although they are implicit, for example the abandonment of routine and prescription is consonant with the concept of clinical reasoning in moving away from rigid rules to guide practice. Clinical reasoning was also linked throughout the case study implicitly and explicitly to knowledge. Explicit links were detailed through the subcomponent of the 'integration of different forms of information'.

The interviews with the students and tutors highlighted the sub component of the pattern recognition model of clinical reasoning. The literature suggests that greater experience contributes to the ability to use pattern recognition owing to the experience of numbers of prior cases (Schmidt et al, 1990; Norman et al, 1996) and this was evident from the interviews as students stressed the importance of personal knowledge to pattern recognition. Although numbers are not a priority for qualitative reporting it is interesting to note that only one clinical tutor mentioned pattern recognition, and this was in response to the participant checking of the transcript. So although the literature emphasises the importance of pattern recognition to expertise (Table 2.6, ii), this was not reflected throughout the case study findings to the same degree. This is surprising as a key component of a course of this nature is the evaluation of clinical patterns as evidenced in common texts (for example, Petty and Moore, 2001).

5.2.5.4 Knowledge

The findings regarding knowledge suggest that the organisation of knowledge is implicitly important to the construct, therefore linking to the component of expertise that is supported by the greatest empirical evidence from the literature (Table 2.6, i). No conclusions can however be formed, as clarity of the articulation of the importance of knowledge to the construct was limited, particularly in its delineation into different forms. Greatest clarity was afforded through the participant observation that is perhaps biased as it is based on the researcher's interpretation of the situation. Overall, the findings suggest that the students and clinical tutors possessed limited understanding of the different forms of knowledge, although personal knowledge was recognised implicitly through the clinical experience of cases, propositional knowledge was recognised through the learning on the initial modules of the course, and process knowledge was recognised through clinical skills. This is therefore an area worthy of future exploration, and this limited understanding perhaps explains the lesser emphasis on knowledge for the case study findings compared to the literature.

The medical literature highlighted that disagreement amongst experts (McGaghie et al, 1994; Wolf et al, 1994; Hatala et al, 1996), suggests that the organisation of knowledge and the management of a situation is unique to the individual (Benner, 1984). This was implicit through the findings of the case study as students were not expected to assess or manage a patient in any defined way. They were expected to make decisions that were based on sound reasoning and could be justified.

The 'abandonment of routine and prescription' subcomponent of clinical reasoning, contests the assertions of Jones (1992) who described knowledge being used through the assistance of principles and rules. Jones (1992) placed greatest emphasis on propositional knowledge as did other authors (Chi et al, 1981; Feltovich and Barrows, 1984, Lesgold et al, 1988). The findings, particularly from the interviews suggest that this may be the current situation for manipulative physiotherapy with emphasis on breadth of propositional knowledge, particularly by the students. The interviews and participant observation highlighted an emphasis on evidence informed knowledge, and therefore again on propositional knowledge originating from research articles.

Eraut (1994) argued that in the action context an individual will use their personal knowledge more than propositional knowledge, and this was supported by some of the existing empirical work (Table 2.6, x) to contribute to the development of Figure 2.5. Students were encouraged to link to previous cases (Benner, 1984), and did so spontaneously in justifying their decisions or explaining their thinking. This was evident from all aspects of the case study and the students also linked use of personal knowledge to pattern recognition. The dependence of knowledge on context is argued as facilitating use of tacit knowledge (Benner, 1984; Benner et al, 1996; Paley, 1996). In direct contrast, the findings of the case study emphasise the clear articulation and justification of all decision-making and thinking. The high emphasis on the justification of decisions was therefore inhibitory of using tacit knowledge. This does not however, negate the importance of tacit knowledge within the organisation of knowledge, and may reflect the Masters course as one stage in the development of expertise for these students, who will subsequently go on to

develop use of their tacit knowledge as part of their continued practice. This argument would be consonant with Benner's (1984) description of the 5 stage model of levels of practice, with the students coming in and perhaps exiting the course at the level of proficient, to then continue to develop to achieve level 5 of expert characterised by intuitive functioning.

An emphasis was placed on process knowledge through some empirical work (Cervero, 1988; Jensen et al, 1992), and this again contributed to the model in Figure 2.5. Emphasis on process knowledge was observed through the participant observation, but again possible bias of the researcher's interpretation exists. In addition, all components of the case study placed great emphasis on a high level of psychomotor skills to the construct. As discussed in the literature review, clinical / psychomotor skills are encompassed by process knowledge, and one subcomponent emphasised the importance of a broad repertoire and therefore wide choice of skills as important to practice at this level. The other subcomponents of psychomotor skills can be linked to clinical reasoning, as the precision of skills and the quality / reliability of data obtained are central issues to gathering data, ensuring high quality of data to inform reasoning. This analysis again illustrates the complex integration of knowledge and clinical reasoning, and therefore the intricate links across the different components of the construct.

The integration of all forms of knowledge were described as essential to expert practice as illustrated by the developed model (Figure 2.5), that was informed by Higgs et al's (2001) description of blurred boundaries and the ability for transformation between the different forms of knowledge. This was supported

by the findings of the case study, but was again limited as it was a finding from the participant observation only. However, the clinical tutors did recognise it through the integration of knowledge and practice, highlighting the integration of propositional and personal knowledge in particular.

The context of EBP (Bury, 1998) established through the literature review was reflected in the case study through the explicit and implicit reference to evidence throughout, particularly through the component of 'critical analysis of evidence to inform practice'. A 'patient-centred approach' as a component of the construct also establishes the context for the construct. Patient-centred practice is explicit through the NHS Plan (DOH, 2000a) and the model developed from Bury (1998) of EBP (Figure 2.1). In addition, it is clear from all aspects of the case study that a feature of moving away from routine and prescription is the continued development of a patient-centred approach where the assessment and management of a patient are reasoned through for the patient as an individual. A patient-centred approach was also highlighted by the literature (Table 2.6, viii) as a component of expertise, and these findings, particularly through the students' articulation that this approach was new to them, therefore support the existing literature. A commitment to, and recognition of the importance of CPD lends support to the continuing education model (Figure 2.3), and also the findings of Jensen et al (2000).

In contrast to the findings of the Delphi method, few characteristics of expertise described in the literature are absent in the detailed components from the case study (speed of cognitive ability, intuition, greater time analysing the problem although arrive at solutions faster than novices). This is essentially owing to the

depth obtained by the findings in identifying components and specific subcomponents of the construct that link explicitly and implicitly to the characteristics in Table 2.6. Those characteristics absent therefore merit further investigation.

5.2.5.5 Context of healthcare research exploring Masters level

The findings regarding knowledge are in agreement with the work of Gerrish et al (2000) in observing a deepening and broadening of knowledge, although for the case study the emphasis was on breadth. A critical approach to practice was emphasised by all aspects of the case study, similarly to the existing literature (Davis and Burnard, 1992; Gerrish et al, 2000; Whyte et al, 2000). The literature's emphasis on competence in research methods and undertaking research (Davis and Burnard, 1992) was not reflected, although an increased awareness of research (Whyte et al, 2000) was evident through the components of the construct concerning knowledge and criticality in approach. The independence of the practitioners in their role was implicit throughout the case study in support of the findings of Davis and Burnard (1992). However, there was no evidence of development of their clinical role (Davis and Burnard, 1992; Gerrish et al, 2000), although some students did encompass future plans for specialist posts as part of the interviews. The identified component of 'creative practice' was in agreement with Davis and Burnard's findings (1992), and a 'high level of confidence' was also found by Whyte et al (2000). The findings from the case study were therefore similar to those of the existing empirical research in healthcare, although the components of 'high level of clinical reasoning' and 'high level of psychomotor skills' have not been identified

previously. In contrast to the Delphi, the empirical finding of increased confidence in complex situations (Whyte et al, 2000) was recognised to some degree.

5.2.5.6   Context of QAA descriptor

The emphasis of the QAA descriptor (2001a) on knowledge is reflected in the findings from the case study, as is the descriptor's emphasis on a critical understanding of knowledge. Within the evidence informed subcomponent of knowledge, participants emphasised the awareness of research methods and critique that is articulated in the descriptor, and the application to professional practice. The case study did not however identify involvement in research at Masters level, and this may be explained by the data collection for the case study occurring during a period of placement, which effectively focused attention on clinical practice, perhaps at the expense of research practice. Certainly, as part of the course, all students proceed to complete a research assignment.

Dealing effectively with complex issues, the making of sound judgements, communicating conclusions, and decision-making in complex situations (QAA, 2001a), are clearly observed in the findings of the case study through the components of clinical reasoning and the justification of decisions. In addition, the concepts of originality and creativity (QAA, 2001a) are reflected in the identified component of creative practice. The commitment to CPD is also evident across both the descriptor and the case study findings. In addition, independent learning ability and self-direction (QAA, 2001a) is implicit through many identified components of the construct, particularly through a 'high level of

self-analysis'. All aspects of the QAA descriptor are again reflected in the data. The greatest emphasis of the case study on clinical reasoning is again implicit within the descriptor, but not articulated or intended to be articulated specifically.

5.2.6 Limitations of the case study

Issues central to the quality of the case study have already been considered (Section 5.2.4). In addition, the methodology emphasised the evolving nature of the conceptual framework informing the development of the case study. It was therefore also influenced by the Delphi study owing to the timing of the different stages (Figure 3.5) which could be considered as problematic through a positivistic tradition. However, the counter argument contends that the Delphi informing the case study is a natural process of developing the conceptual framework, enabling ideas from the Delphi to be explored within the case study and therefore enhancing the mixed methods approach and the convergence of findings.

On reflection, the use of semi-structured interviews may have limited the depth of some aspects of the data. The choice of semi-structured interviews was influenced by the researcher's positivistic origins to some degree, and an unstructured approach may have gained greater insight. However the use of semi-structured interviews can be justified owing to the evolving conceptual framework for this study that enabled structure, and by the aim of achieving consistency across the participants. The process of participant checking supported the accuracy of the transcripts and did raise a couple of further

issues. Use of the issues raised was however limited as there was no opportunity to explore the data further.

Morse (1995) suggested that the quantity of data in an analytical category is not important theoretically. The researcher's positivistic origins are therefore reflected in the analysis of the case study where the components of the construct are described in perceived order of importance based upon the attention components achieved. It is argued however that this was useful in enabling construction of the generic model (Figure 5.1), particularly through describing the contributions of knowledge and clinical reasoning.

Another limiting factor for the case study may be the use of a specialist course that is a route to membership of a Clinical Interest Group of the professional body. This group conforms to national and international standards for practice within manipulative physiotherapy, and this may have influenced the agreement across the participants of the case study and the early saturation of data. This may also have been influenced by the information provided to participants across the study, providing time for thought / consultation of documentation prior to interviews / observations.

5.3   Convergence of methods

The convergence of the Delphi and case study findings (Table 4.17) highlight the congruence of the data achieved across the two methods, with 8 components of the construct of Masters level clinical practice being identified by both, and the most important component of both methods being clinical

reasoning. In contrast, the differences in the methods are reflected in the generic versus specific nature of the identified components and subcomponents.

The similarity of the Delphi and case study findings supports the articulation of generic components of the construct of Masters level clinical practice. In addition, the identified differences support the need for the inclusion of specific components and prioritisation of components dependent upon profession / speciality. The process of convergence has therefore contributed to one picture (generic components) but also in providing different insights (Silverman, 1993). It cannot however be concluded whether the specific components are individual to a profession or a speciality, as the case study explored one specialist aspect of physiotherapy only, and the Delphi was only able to explore differences between the two professions of radiography and physiotherapy. In light of the findings and in the context of the literature review, the following model represents the generic components of the construct of Masters level clinical practice (Figure 5.1).

The model highlights the considerable overlap between the components of knowledge and clinical reasoning as evidenced from this study and the literature review. The two components have been given equal weighting in the model to reflect a combination of the priority found on knowledge from the literature review, QAA descriptor and the existing empirical work exploring Masters courses in healthcare, balanced against the emphasis on clinical reasoning from this study. The components constituting the personal characteristics inform

the use of knowledge and clinical reasoning, and guide all aspects of clinical practice.

Figure 5.1: Generic components of the construct of Masters level clinical practice

High level of clinical reasoning

Advanced use of knowledge
(encompasses high level of clinical skills as part of process knowledge)

Context of evidence based practice

Personal characteristics
High level of:
- Criticality of practice
- Criticality of evidence to inform practice
- Adaptability
- Creativity
- Reflective practice
- Self- analysis
- Motivation for CPD
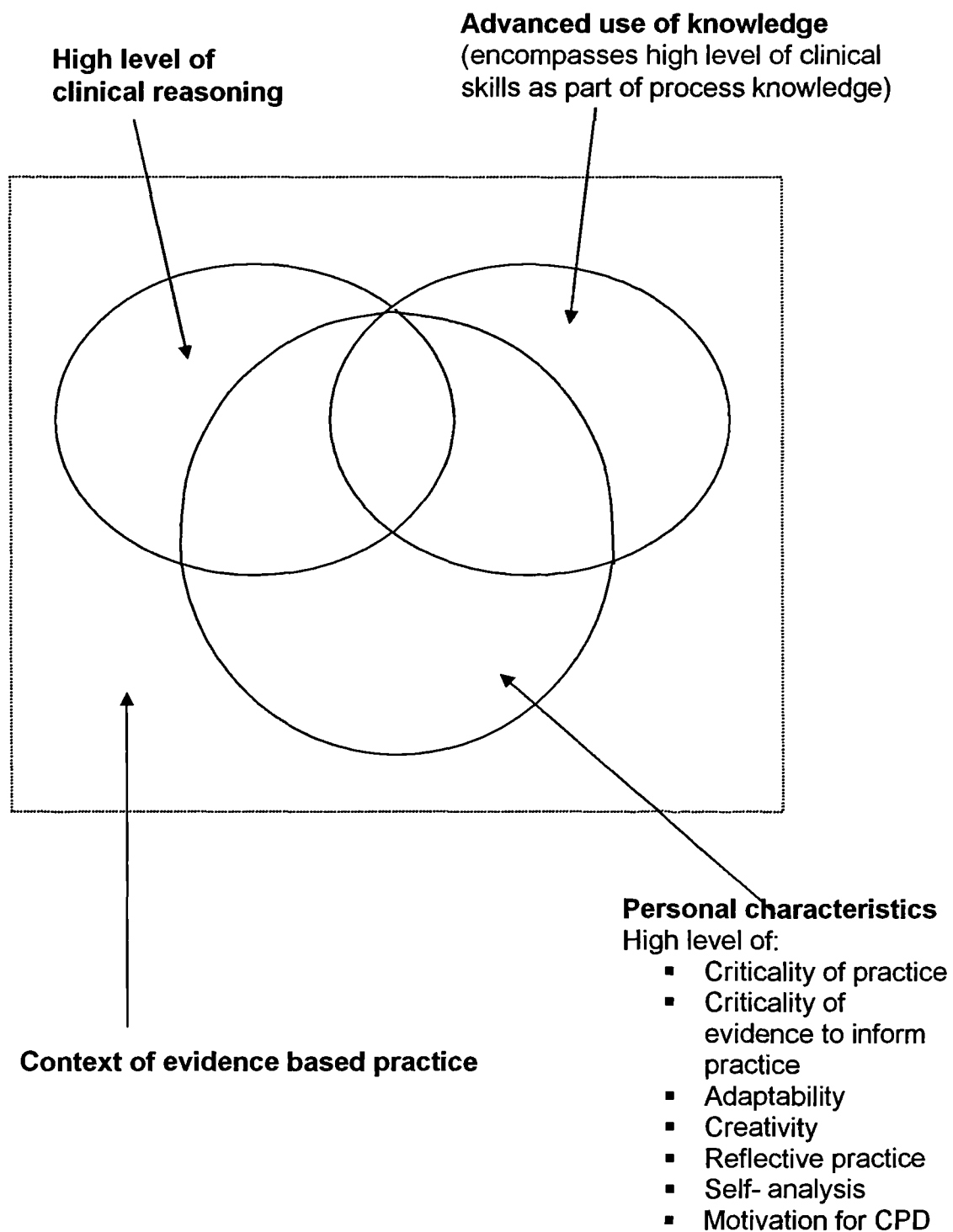
The personal characteristics encompass those components that were congruent across both methods, and in addition those that possessed a similar emphasis across the two methods ('high level of self-analysis' and 'high level of self-evaluation and identification of learning needs'). 'High level of reflective practice' was also included as this was implicit throughout the case study as highlighted by the discussion. The remaining components of the Delphi study can be argued as subsumed within those detailed within the model, and supported by the overlap between some behaviours identified earlier (Section 5.1.4). Through articulation of the model of the generic components of the construct, the case study therefore further supports the reliability and validity of the components of the construct identified through the Delphi method. In the convergence of methods it is also necessary to consider differing assumptions that support the methods. Barbour (1999) emphasises the importance of the explicit nature of this information, and hence the attention to internal and external validity / credibility and transferability throughout.

The generic model is adapted to illustrate the generic and specific components for manipulative physiotherapy. It therefore reflects different components of the construct, different prioritisation of components, and the emphasis afforded by the identified subcomponents (Figure 5.2). The developments to the model are illustrated in italics.

High level of clinical reasoning
- *Diagnostic in nature*
- *Continuous throughout management*
- *Quality of information gained is important*
- *Primarily hypothetico-deductive*
- *Some use of pattern recognition*
- *Prioritisation a central issue*

Advanced use of knowledge
(encompasses high level of clinical skills as part of process knowledge)
- *Breadth of propositional knowledge*
- *Effective use of personal knowledge*
- *Integration of all forms of knowledge*
- *Broad repertoire of skills*

Context of evidence based practice *and patient-centred practice*
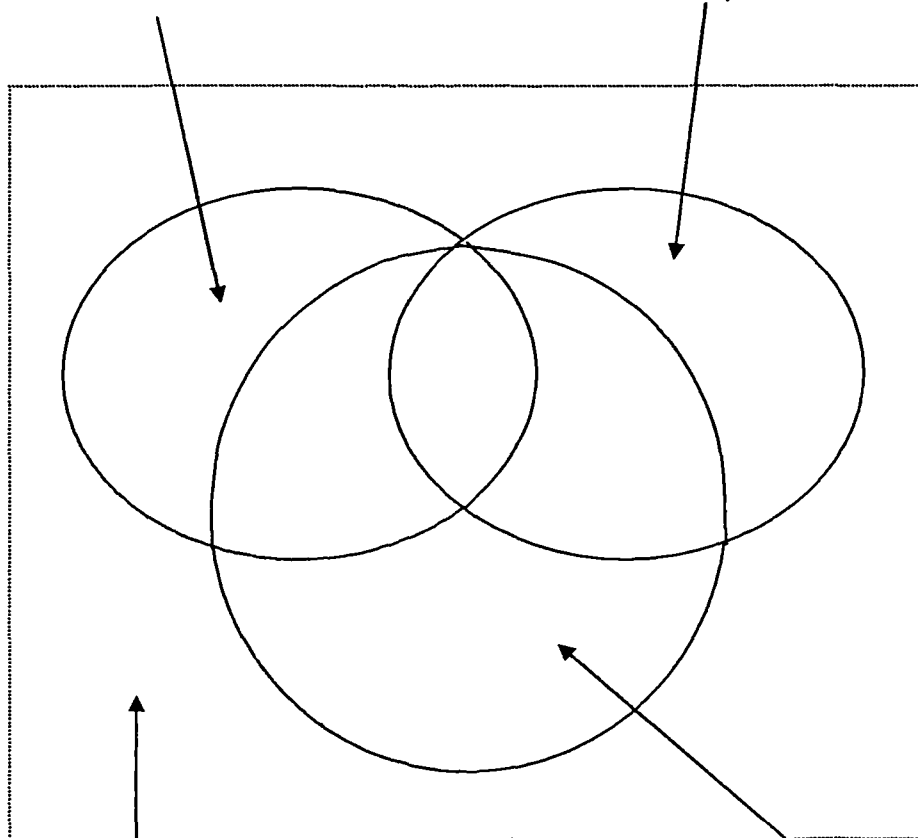
Personal characteristics
High level of:
- *Justification of decisions*
- Criticality of practice
- Criticality of evidence to inform practice
- Adaptability
- Creativity
- Reflective practice
- Self- analysis
- Motivation for CPD
- *Confidence*

The above models are therefore reflective of Masters level clinical practice, expert clinical practice, and specialist practice, as justified through the comparability established in the literature review (Donaghy and Gosling, 1999; Raja-Jones, 2002), the findings of the Delphi study, and the constant reference to specialist practice by the participants within the case study.

The convergence of the two methods illustrates the different types of answers that can be derived from different methods (Mays and Pope, 1995), while their similar emphasis enabled convergence of findings. The Delphi method identified a description of the construct that was influenced by educational descriptors and in particular the QAA documentation (2001a). In contrast, the case study illustrated the detail and depth of the construct through individuals' collective understanding and experiences, and reflected the literature review, QAA (2001a) descriptor and the existing empirical work in healthcare (Table 2.2). These different methods and contexts enabled the development of a construct through greater insight, and emphasise the value of a mixed methods approach in agreement with Barbour (1999), who argued that when methods are integrated, the whole is greater than the sum of all of the parts. The Delphi and case study components of this study have therefore assisted the articulation of the construct of Masters level clinical practice that is integrative of what were initially considered as 'academic' and 'clinical' components. However, it must be remembered that data are context specific and therefore care must be taken when generalising / transferring findings.

6.   CONCLUSION

Educational practice needs to become evidence informed (Davies, 1999) and informed articulation of the construct of Masters level clinical practice is an important aspect of this evidence within healthcare, particularly owing to the increasing emphasis on Masters courses in developing clinical expertise and the current proliferation of courses.

6.1   Measurement validity of the construct

The Delphi study provided expert opinion, perhaps without the bias that can occur through other consensus techniques (Williams and Webb, 1994). It can therefore be argued that the Delphi approach encouraged an opinion that was independent of the influence of peers. As the behaviours were generated from the participants and critically reviewed iteratively, the different aspects of measurement validity for the construct's potential use as a tool for assessment purposes were developed. The 20 identified behaviours were justified as demonstrating good content validity. In addition, as the behaviours were provided by the course tutors themselves, they possessed high face and again content validity. High concurrent validity can also be argued as the experts in the form of course tutors have identified the behaviours and agreed upon their importance. Construct validity can also be confirmed as the similarity in the findings and the relationship between the components identified from the Delphi and case study reflect the theoretical relationships of the construct. In addition to this high level of measurement validity for the construct of Masters level clinical practice, the process of the Delphi involving the course tutors

contributes to an increased commitment from the course tutors to the outcomes of the research (Dennis et al, 1989), again supporting the potential use of the construct as a tool for assessment.

The converged findings from the Delphi and case study were congruent with the issues emerging from the existing literature regarding expertise, the QAA descriptor (2001a), and the existing empirical work in healthcare (Table 2.2) regarding Masters level. This again supports the measurement validity of the construct, but also the reliability and validity / truthfulness of the study.

6.2   Construct validation

Validation of the construct of Masters level clinical practice can be evaluated through consideration of the issues of 'convergence' and 'discrimination' (Kerlinger and Lee, 2000). Convergence of the data from the different methods has supported construct validity and therefore the same interpretation of the construct. This enabled articulation of the generic model as the theory behind the construct was congruent across both methods. Similarly the data provide some support for discrimination as the construct has been differentiated from a novice's level of practice throughout the study.

6.3   Conclusions of the study

This study has therefore provided a sound basis for future research by affording insight into the construct of Masters level clinical practice. However this study must be viewed in the context of its intentions and limitations (as described

throughout the discussion). It provides preliminary work within this area that has the potential for being generalised beyond this study. The generic model can therefore be used as the basis for future research, and its generalisability can be evaluated across other professions and specialities. In the context of the limitations of the study therefore, the generic components of the construct of Masters level clinical practice have been defined. In addition, the generic model has been adapted to encompass the specific components and their prioritisation for the speciality of manipulative physiotherapy. The measurement validity of the construct is good, and therefore provides justification for use of the construct in informing course design and the development of a tool for the assessment of student performance.

6.4   Limitations and recommendations for future research

The quality and depth of data achieved through the case study support the value of the mixed methods approach. However, the limitations of few professions and one speciality being encompassed by this study limit its generalisability. Further case studies across professions and specialities would therefore be valuable in providing further insight to the articulation of the construct of Masters level clinical practice through analytic generalisation, to explore if the generic construct and the concepts of specific components and the prioritisation of components across speciality and profession, are sustained across a variety of circumstances (Murphy et al, 1998b).

7. REFERENCE LIST

Adelson, M. Aroni, S. (1975) 'Differential images of the future', in Linstone, H. Turoff, M. (Eds) The Delphi Method: Techniques, and Applications, London, Addison Wesley Publishing Company, pp 433-462.

Anderson, J.R. (1987) 'Skill acquisition: compilation of weak-method problem solutions', Psychological Review, Vol.94, No.2, pp 192-210.

Andrews, M. Lyne, P. Riley, E. (1996) 'Validity in qualitative health care research: an exploration of the impact of individual researcher perspectives within collaborative enquiry', Journal of Advanced Nursing, Vol.23, pp 441-447.

Atkins, M.J. Redley, M. (1998) 'The assurance of standards at Masters level: an empirical investigation', Higher Education Quarterly, Vol.52, No.4, pp 378-393.

Babbie, E. (1990) Survey Research Methods, 2nd edn, Belmont, Wadsworth Publishing.

Bailey, K.D. (1987) Methods of Social Research, 3rd edn, New York, The Free Press.

Barbour, R. (1999) 'The case for combining qualitative and quantitative approaches in health services research', Journal of Health Services Research and Policy, Vol.4, No.1, pp 39-43.

Barnett, R. (1990) The Idea of Higher Education, Milton Keynes, Open

University Press.

Barriball, K.L. While, A. (1994) 'Collecting data using a semi-structured

interview: a discussion paper', Journal of Advanced Nursing, Vol.19, pp 328-

335.

Benner, P. (1984) From Novice to Expert: Excellence and Power in Clinical

Nursing Practice, California, Addison-Wesley.

Benner, P. Tanner, C.A. Chesla, C.A. (1996) Expertise in Nursing Practice:

Caring, Clinical Judgement and Ethics, New York, Springer Publishing

Company.

Berliner, D. (1988) The Development of Expertise in Pedagogy, Washington,

American Association of Colleges for Teacher Education.

Binkley, J. Finch, E. Hall, J. Black, T. Gowland, C. (1993) 'Diagnostic

classification of patients with low back pain: report on a survey of physical

therapy experts', Physical Therapy, Vol.73, No.3, pp 138-155.

Bordage, G. Zacks, R. (1984) 'The structure of medical knowledge in the

memories of medical students and general practitioners: categories and

prototypes', Medical Education, Vol.18, pp 406-416.

Bordage, G.H. Lemieux, M. (1991) 'Semantic structures and diagnostic thinking of experts and novices', Academic Medicine, Vol.66(suppl), pp s70-s72.

Bordage, G. (1994) 'Elaborated knowledge: a key to successful diagnostic thinking', Academic Medicine, Vol.69, No.11, pp 883-885.

Bork, C.E. (1993) Research in Physical Therapy, Philadelphia, Lippincott.

Boshuizen, H.P.A. Schmidt, H.G. (1992) 'On the role of biomedical knowledge in clinical reasoning by experts, intermediates and novices', Cognitive Science, Vol.16, pp 153-184.

Boyd, E.M. Fales, A.W. (1983) 'Reflective learning: key to learning from experience', Journal of Humanistic Psychology, Vol.23, No.2, pp 99-117.

Britten, N. (2000) 'Qualitative interviews in health care research', in Pope, C. Mays, N. (Eds) Qualitative Research in Health Care, 2nd edn, London, British Medical Journal Publishing Group, pp 11-19.

Brooks, L.R. Norman, G.R. Allen, S.W. (1991) 'Role of specific similarity in a medical diagnostic task', Journal of Experimental Psychology: General, Vol.120, No.3, pp 278-287.

Bury, T. (1998) 'Evidence-based healthcare explained', in Bury, T. Mead, J. (Eds) Evidence-Based Healthcare: A Practical Guide for Therapists, Oxford, Butterworth Heinemann, pp 3-25.

Caney, D. (1983) 'Competence – can it be assessed?' Physiotherapy, Vol.69, No.8, pp 302-304.

Carr, J. Shepherd, R. (1996) 'Clinical physiotherapy specialisation in Australia: some current views', Australian Journal of Physiotherapy, Vol.42, No.1, pp 9-14.

Carr, W. Kemmis, S. (1986) Becoming Critical: Education, Knowledge and Action Research, London, Falmer Press.

Carter, K. Sabers, D. Cushing, K. Pinnegar, S. Berliner, D. (1987) 'Processing and using information about students: a study of expert, novice and postulant teachers', Teaching and Teacher Education, Vol.3, No.2, pp 147-157.

Case, K. Harrison, K. Roskell, C. (2000) 'Differences in the clinical reasoning process of expert and novice cardiorespiratory physiotherapists', Physiotherapy, Vol.86, No.1, pp 14-21.

Cervero, R. (1988) Effective Continuing Education for Professionals, San Francisco, Jossey-Bass Inc. Publishers.

Cervero, R.M. (2001) 'Continuing professional education in transition, 1981-2000', International Journal of Lifelong Education, Vol.20, No.1/2, pp 16-30.

Chase, W.G. Simon, H.A. (1973) 'Perception in chess', Cognitive Psychology, Vol.4, pp 55-81.

Cherryholmes, C.H. (1992) 'Notes on pragmatism and scientific realism, Educational Researcher, Vol.14, August-September, pp 13-17.

Chi, M.T.H. Feltovich, P.J. Glaser, R. (1981) 'Categorization and representation of physics problems by experts and novices', Cognitive Science, Vol.5, pp 121-152.

Cohen, L. Mannion, L. Morrison, K. (2000) Research Methods in Education, 5th edn, London, Routledge Falmer.

Committee on Higher Education. (1963) Report of the Committee on Higher Education, London, Her Majesty's Stationery Office.

Converse, J.M. Presser, S. (1994) 'Survey questions: handcrafting the standardized questionnaire', in Lewis-Beck, M.S. (Ed) Research Practice, Thousand Oaks, Sage Publications, pp 89-161.

Conway, J.E. (1998) 'Evolution of the species 'expert nurse'. An examination of the practical knowledge held by expert nurses', Journal of Clinical Nursing, Vol.7, pp 75-82.

Cope, P. Cuthbertson, P. Stoddart, B. (2000) 'Situated learning in the practice placement', Journal of Advanced Nursing, Vol.31, No.4, pp 850-856.

Coulon, L. Mok, M. Krause, K.L. Anderson, M. (1996) 'The pursuit of excellence in nursing care: what does it mean?' Journal of Advanced Nursing, Vol.24, pp 817-826.

Creswell, J.W. (1999) 'Mixed-method research: introduction and application', in Cizek, G.J. (Ed) Handbook of Educational Policy, San Diego, Academic Press, pp 455-472.

Creswell, J.W. (2003) Research Design: Qualitative, Quantitative and Mixed Methods Approaches, 2nd edn, Thousand Oaks, Sage Publications.

Cross, V. (1999) 'The same but different: a Delphi study of clinicians' and academics' perceptions of physiotherapy undergraduates', Physiotherapy, Vol.85, No.1, pp 28-39.

Cross, V. (2001) 'Approaching consensus in clinical competence assessment: third round of a Delphi study of academics' and clinicians' perceptions of physiotherapy undergraduates', Physiotherapy, Vol.87, No.7, pp 341-350.

CSP. (1983) 'Report of the review committee', Physiotherapy, Vol.69, no.3(suppl), pp 1-16.

CSP. (1995) Specialists and Specialisms. Information paper PA23, London, CSP.

Davids, K. Myers, C. (1990) 'The role of tacit knowledge in human skill performance', Journal of Human Movement Studies, Vol.19, pp 273-288.

Davies, P. (1999) 'What is evidence-based education?' British Journal of Educational Studies, Vol.47, No.2, pp 108-121.

Davis, B.D. Burnard, P. (1992) 'Academic levels in nursing', Journal of Advanced Nursing, Vol.17, pp 1395-1400.

de Groot, A.D. (1965) Thought and Choice in Chess, The Hague, Mouton.

Delitto, A. Shulman, A.D. Rose, S.J. (1989) 'On developing expert-based decision-support systems in physical therapy: the NIOSH low back atlas', Physical Therapy, Vol.69, No.7, pp 554-558.

Dembo, M.H. (1994) Applying Educational Psychology, London, Longman.

Dennis, K.E. Howes, D.G. Zelauskas, B. (1989) 'Identifying nursing research priorities: a first step in program development', Applied Nursing Research, Vol.2, No.3, pp 108-113.

DOH. (1991) Doctors in Training: A New Deal, London, Stationery Office.

DOH. (1999a) Agenda for Change: Modernising the NHS Pay System, London, Stationery Office.

DOH. (1999b) Making a Difference: Strengthening the Nursing, Midwifery and Health Visitor Contribution to Health and Health Care, London, Stationery Office.

DOH. (2000a) The NHS Plan, London, Stationery Office.

DOH. (2000b) Meeting the Challenge: A Strategy for the Allied Health Professions, London, Stationery Office.

DOH. (2001) Research Governance Framework for Health and Social Care, London, Stationery Office.

Donaghy, M.E. Gosling, S. (1999) 'Specialization in physiotherapy: musings on current concepts and possibilities for harmonization across the European Union', Physical Therapy Reviews, Vol.4, pp 51-60.

Doody, C. McAteer, M. (2002) 'Clinical reasoning of expert and novice physiotherapists in an outpatient orthopaedic setting', Physiotherapy, Vol.88, No.5, pp 258-268.

Dreyfus, H.L. Dreyfus, S.E. (1986) Mind Over Machine: The Power of Human Intuition and Expertise in the Era of the Computer, Oxford, Basil Blackwell.

Duffield, C. (1993) 'The Delphi technique: a comparison of results obtained using two expert panels', International Journal of Nursing Studies, Vol.30, No.3, pp 227-237.

Elkan, R. Robinson, J. (1995) 'Project 2000: a review of published research', Journal of Advanced Nursing, Vol.22, pp 386-392.

Elstein, A.S. Shulman, L.S. Sprafka, S.A. (1978) Medical Problem Solving: An Analysis of Clinical Reasoning, Cambridge, Massachusetts, Harvard University Press.

Elstein, A.S. Shulman, L.S. Sprafka, S.A. (1990) 'Medical problem solving: a ten-year retrospective', Evaluation and the Health Professions, Vol.13, No.1, pp 5-36.

Elstein, A.S. (2000) 'Clinical problem solving and decision psychology, comment on the epistemology of clinical reasoning', Academic Medicine, Vol.75, No.10, pp s134-s136.

Elstein, A.S. Schwarz, A. (2002) 'Clinical problem solving and diagnostic decision making: selective review of the cognitive literature', British Medical Journal, Vol.324, pp 729-732.

Embrey, D.G. Guthrie, M.R. White, O.R. Dietz, J. (1996) 'Clinical decision making by experienced and inexperienced pediatric physical therapists for children with diplegic cerebral palsy', Physical Therapy, Vol.76, No.1, pp 20-33.

English, I. (1993) 'Intuition as a function of the expert nurse: a critique of Benner's novice to expert model', Journal of Advanced Nursing, Vol.18, pp 387-393.

Eraut, M. (1985) 'Knowledge creation and knowledge use in professional contexts', Studies in Higher Education, Vol.10, No.2, pp 117-133.

Eraut, M. (1994) Developing Professional Knowledge and Competence, London, The Falmer Press.

Ericsson, K.A. Smith, J. (1991) 'Prospects and limits of the empirical study of expertise: an introduction', in Ericsson, K.A. Smith, J. (Eds) Toward a General Theory of Expertise: Prospects and Limits, Cambridge, Cambridge University Press, pp 1-38.

Ericsson, K.A. Krampe, R.T. Tesch-Romer, C. (1993) 'The role of deliberate practice in the acquisition of expert performance', Psychology Reviews, Vol.100, No.3, pp 363-406.

Ericsson, K.A. (1996) 'The acquisition of expert performance: an introduction to some of the issues', in Ericsson, K.A. (Ed) The Road to Excellence, Hillsdale, New Jersey, Lawrence Erlbaum Associates Inc, pp 1-50.

Eysenck, M.W. Keane, M.T. (1990) Cognitive Psychology: A Student's Handbook, Hillsdale New Jersey, Erlbaum.

Feltovich, P.J. Barrows, H.S. (1984) 'Issues of generality in medical problem solving', in Schmidt, H.G. De Volder, M.L. (Eds) Tutorials in Problem Based Learning: A New Direction in Teaching the Health Professions, Assen, Holland, Van Gorcum, pp 128-142.

Fenton, M. (1992) 'Education for the advanced practice of clinical nurse specialists', <u>Oncology Nursing Forum</u>, Vol.19, No.1 (suppl), pp 16-20

Field, P.A. Morse, J.M. (1989) <u>Nursing Research: The Application of Qualitative Approaches</u>, London, Chapman and Hall.

Fitzpatrick, J.M. While, A.E. Roberts, J.D. (1996) 'Operationalisation of an observation instrument to explore nurse performance', <u>International Journal of Nursing Studies,</u> Vol.33, No.4, pp 349-360.

Fox-Young, S.K. (1995) 'Issues in the assessment of expert nurses: purposes, standards and methods', <u>Nurse Education Today,</u> Vol.15, pp 96-100.

Frost, N. (2001) 'Professionalism, change and the politics of lifelong learning', <u>Studies in Continuing Education</u>, Vol.23, No.1, pp 5-17.

Gerrish, K. Ashworth, P.D. McManus, M. (2000) 'Some dilemmas of Master's level nurse education', <u>Journal of Advanced Nursing</u>, Vol.32, No.4, pp 834-841.

Gerth, W. Smith, M.E. (1991) <u>The Delphi Technique. Background for Use in Probability Estimation</u>, Whitehouse Station, New Jersey, Merck and Company.

Glaser, R. Chi, M.T.H. (1988) 'Overview', in Chi, M.T.H. Glaser, R. Farr, M.J. (Eds) <u>The Nature of Expertise</u>, Hillsdale, Lawrence Erlbaum Associates, pp xvi-xxviii.

Glaser, R. (1999) 'Expert knowledge and processes of thinking', in McCormick, R. Paechter, C. (Eds) Learning and Knowledge, London, Paul Chapman Publishing Ltd, pp 88-102.

Gordon, M. (1980) 'Predictive strategies in diagnostic tasks', Nursing Research, Vol.29, pp 39-45.

Gordon, R.L. (1975) Interviewing: Strategy, Techniques and Tactics, Illinois, Dorsey Press.

Gosling, S. (1999) 'Physiotherapy and postgraduate study: a follow-up discussion paper', Physiotherapy, Vol.85, No.3, pp 117-121.

Green, B. Jones, M. Hughes, D. Williams, A. (1999) 'Applying the Delphi technique in a study of GP's information requirements', Health and Social Care in the Community, Vol.7, No.3, pp 198-205.

Hammersley, M. (1992) 'Deconstructing the qualitative-quantitative divide', in Hammersley, M. (Ed) What's Wrong with Ethnography? London, Routledge, pp 159-182.

Hardy, L.K. Sinclair, H. Hughes, J. (1984) 'Nursing careers: findings of a follow-up survey of graduates of the nursing education and administration certificate courses of the Department of Nursing Studies, University of Edinburgh, 1958-75', Journal of Advanced Nursing, Vol.9, pp 611-618.

Hatala, R.A. Norman, G.R. Brooks, L.R. (1996) 'The effect of clinical history on physicians' ECG interpretation skills', Academic Medicine, Vol.71(suppl), No.10, pp s68-70.

Heater, S.L. (1992) 'Specialization or uniformity within the profession?' American Journal of Occupational Therapy, Vol.46, No.2, pp 172-173.

HEQC. (1996) Graduate Standards Programme: Academic Standards in the Approval, Review and Classification of Awards, London, HEQC.

Higgs, J. (1990) 'Fostering the acquisition of clinical reasoning skills', New Zealand Journal of Physiotherapy, December, pp 13-17.

Higgs, J. (1992) 'Developing clinical reasoning competencies', Physiotherapy, Vol.78, No.8, pp 575-581.

Higgs, J. Hunt, A. (1999) 'Redefining the beginning practitioner', Focus on Health Professional Education: A Multidisciplinary Journal, Vol.1, No.1, pp 34-48.

Higgs, J. Jones, M. (2000) Clinical Reasoning in the Health Professions, 2nd edn, Oxford, Butterworth Heinemann.

Higgs, J. Andresen, L. (2001) 'The knower, the knowing and the known: threads in the woven tapestry of knowledge', in Higgs, J. Titchen, A. (Eds) <u>Practice Knowledge and Expertise in the Health Professions</u>, Oxford, Butterworth Heinemann, pp 10-21.

Higgs, J. Titchen, A. (2001) (Eds) <u>Practice Knowledge and Expertise in the Health Professions</u>, Oxford, Butterworth Heinemann.

Higgs, J. Titchen, A. Neville V. (2001) 'Professional Practice and Knowledge', in Higgs, J. Titchen, A. (Eds) <u>Practice Knowledge and Expertise in the Health Professions</u>, Oxford, Butterworth Heinemann, pp 3-9.

Higher Education Funding Council for England. (1996) <u>Review of Postgraduate Education,</u> Bristol, Higher Education Funding Council for England.

Holstein, J.A. Gubrium, J.F. (1995) <u>The Active Interview</u>, London, Sage.

Holsti, O. (1969) <u>Content Analysis for the Social Sciences and Humanities</u>, Boston, Addison-Wesley Publishing Company.

Houle, C.O. (1980) <u>Continuing Learning in the Professions</u>, San Francisco, Jossey Bass.

James, C. Redfern, L. (1995) 'The description of levels in nursing degrees: an illustration and analysis of variations', <u>Journal of Advanced Nursing</u>, Vol.21, pp 311-317.

Jarvis, P. (1992) 'Learning practical knowledge', in Baskett, H.K.M. Marsick,

V.J. (Eds) Professions' Ways of Knowing: New Findings on How to Improve

Professional Education, San Francisco, Jossey Bass, pp 89-94.

Jarvis, P. (1995) Adult and Continuing Education, Theory and Practice, 2nd edn,

London, Routledge.

Jasper, M.A. (1994) 'Expert: a discussion of the implications of the concepts as

used in nursing', Journal of Advanced Nursing, Vol.20, pp 769-776.

Jensen, G.M. Shepard, K.F. Hack, L.M. (1990) 'The novice versus the

experienced clinician: insights into the work of the physical therapist', Physical

Therapy, Vol.70, No.5, pp 314-323.

Jensen, G.M. Shepard, K.F. Gwyer, J. Hack, L.M. (1992) 'Attribute dimensions

that distinguish master and novice physical therapy clinicians in orthopedic

settings', Physical Therapy, Vol.72, No.10, pp 711-722.

Jensen, G.M. Gwyer, J. Shepard, K.F. Hack, L.M. (2000) 'Expert practice in

physical therapy', Physical Therapy, Vol.80, No.1, pp 28-43.

Jones, M.A. (1992) 'Clinical reasoning in manual therapy', Physical Therapy,

Vol.72, No.12, pp 875-884.

Jones, J. Hunter, D. (2000) 'Using the Delphi and nominal group technique in health services research', in Pope, C. Mays, N. (Eds) <u>Qualitative Research in Health Care</u>, 2nd edn, London, British Medical Journal Publishing Group, pp 40-49.

Keen, J. Packwood, T. (2000) 'Using case studies in health services and policy research', in Pope, C. Mays, N. (Eds) <u>Qualitative Research in Health Care</u>, 2nd edn, London, British Medical Journal Publishing Group, pp 50-58.

Kerlinger, F.N. Lee, H.B. (2000) <u>Foundations of Behavioural Research</u>, 4th edn, Fort Worth, Harcourt College Publishers.

King, C.A. Bithell, C. (1998) 'Expertise in diagnostic reasoning: a comparative study', <u>British Journal of Therapy and Rehabilitation</u>, Vol.5, No.2, pp 78-87.

Koch, T. (1994) 'Establishing rigour in qualitative research: the decision trail', <u>Journal of Advanced Nursing</u>, Vol.19, pp 976-986.

Kolb, D.A. (1984) <u>Experiential Learning - Experience as the Source of Learning and Development</u>, New Jersey, Prentice-Hall.

Krampe, R. Ericsson, K.A. (1996) 'Maintaining excellence: deliberate practice and elite performance in young and older pianists', <u>Journal of Experimental Psychology: General</u>, Vol.125, No.4, pp 331-359.

Krosnick, J.A. (1999) 'Survey research', Annual Review of Psychology, Vol.50, pp 537-567.

Larkin, J. McDermott, J. Simon, D.P. Simon, H.A. (1980) 'Expert and novice performance in solving physics problems', Science, Vol.208, pp 1135-1142.

Lemieux, M. Bordage, G. (1992) 'Propositional versus structural semantic analyses of medical diagnostic thinking', Cognitive Science, Vol.16, pp 185-204.

Lesgold, A. Rubinson, H. Feltovich, P.J. Glaser, R. Klopfer, D. Wang, Y. (1988) 'Expertise in a complex skill: diagnosing X ray pictures', in Chi, M.T.H. Glaser, R. Farr, M. (Eds) The Nature of Expertise, Hillsdale, New Jersey, Erlbaum, pp 311-432.

Lincoln, Y.S. Guba, E.G. (1985) Naturalistic Inquiry, Newbury Park, Sage Publications.

Mangione, T.W. (1998) 'Mail surveys', in Bickman, L. Rog, D.G. (Eds) Handbook of Applied Social Research Methods, Thousand Oaks, Sage Publications, pp 399-427.

Mattingly, C. (1991) 'The narrative nature of reasoning', The American Journal of Occupational Therapy, Vol.45, No.11, pp 998-1005.

Mattingly, C. Fleming, M.H. (1994) Clinical Reasoning, Philadelphia, FA Davis Company.

Maxwell, M. (1995) 'Problems associated with clinical education of physiotherapy students: a Delphi survey', Physiotherapy, Vol.81, No.10, pp 582-587.

May, B.J. Dennis, J.K. (1991) 'Expert decision making in physical therapy - a survey of practitioners', Physical Therapy, Vol.71, No.3, pp 190-206.

Mays, N. Pope, C. (1995) 'Rigour and qualitative research', British Medical Journal, Vol.311, pp 109-112.

Mays, N. Pope, C. (2000) 'Quality in qualitative health research', in Pope, C. Mays, N. (Eds) Qualitative Research in Health Care, 2nd edn, London, British Medical Journal Publishing Group, pp 89-102.

McGaghie, W.C. Boerger, R.L. McCrimmon, D.R. Ravitch, M.M. (1994) 'Agreement among medical experts about the structure of concepts in pulmonary physiology', Academic Medicine, Vol.69(suppl), No.10, pp s78-80.

McGaghie, W.C. Boerger, R.L. McCrimmon, D.R. Ravitch, M.M. (1996) 'Learning pulmonary physiology: comparison of student and faculty knowledge structures', Academic Medicine, Vol.71(suppl), No.1, pp s13-s15.

Miles, M.B. Huberman, A.M. (1994) Qualitative Data Analysis, 2nd edn, London, Sage Publications.

Morse, J.M. (1995) 'The significance of saturation', Qualitative Health Research, Vol.5, No.2, pp 147-149.

Moser, C.A. Kalton, G. (1971) Survey Methods in Social Investigation, London, Heinemann.

Munn, P. Drever, E. (1990) Using Questionnaires in Small-Scale Research: A Teacher's Guide, Edinburgh, The Scottish Council for Research into Education.

Murphy, M.K. Black, N.A. Lamping, D.L. McKee, C.M. Sanderson, C.F.B. Ashkam, J. Marteau, T. (1998a) 'Consensus developing methods and their use in clinical guideline development', Health Technology Assessment, Vol.2, No.3, pp 1-83.

Murphy, E. Dingwall, R. Greatbach, D. Parker, S. Watson, P. (1998b) 'Qualitative research methods in health technology assessment: a review of the literature', Health Technology Assessment, Vol.2, No.16, pp 1-198.

NCIHE. (1997) Higher Education in the Learning Society, NCIHE, London, Her Majesty's Stationery Office.

Norman, G.R. Tugwell, P. Feightner, J.W. (1982) 'A comparison of resident performance on real and simulated patients', Journal of Medical Education, Vol.57, pp 708-7155.

Norman, G.R. (1990) 'Problem solving skills and problem based learning', Physiotherapy Theory and Practice, Vol.6, pp 53-54.

Norman, G.R. Brooks, L.R. Cunnington, J.P.W. Shali, V. Marriott, M. Regehr, G. (1996) 'Expert – novice differences in the use of history and visual information from patients', Academic Medicine, Vol.71, No.10(suppl), pp s62-s64.

Norman, G.R. (2000) 'The epistemology of clinical reasoning, perspectives from philosophy, psychology and neuroscience', Academic Medicine, Vol.75, No.10, pp s127-s135.

Olsen, J.R. Biolsi, K.J. (1991) 'Techniques for representing expert knowledge', in Ericsson, K.A. Smith, J. (Eds) Toward a General Theory of Expertise: Prospects and Limits, Cambridge, Cambridge University Press, pp 240-285.

Oppenheim, A.N. (1992) Questionnaire Design, Interviewing and Attitude Measurement, 2nd edn, London, Continuum.

Paley, J. (1996) 'Intuition and expertise: comments on the Benner debate', Journal of Advanced Nursing, Vol.23, pp 665-671.

Papa, F.J. Elieson, B. (1993) 'Diagnostic accuracy as a function of case prototypicality', Academic Medicine, Vol.68, No.10(suppl), pp s58-s60.

Papa, F.J. Stone, R.C. Aldrich, D.G. (1996) 'Further evidence of the relationship between case typicality and diagnostic performance: implications for medical education', <u>Academic Medicine</u>, Vol.71, No.1(suppl), pp s10-s12.

Parker, I. (1994) 'Qualitative research', in Banister, P. Burman, E. Parker, I. Taylor, M. Tindall, C. (Eds) <u>Qualitative Methods in Psychology: A Research Guide</u>. Buckingham, Open University Press, pp 1-16.

Patel, V.L. Groen, G.J. (1986) 'Knowledge based solution strategies in medical reasoning', <u>Cognitive Science</u>, Vol.10, pp 91-116.

Patel, V.L. Groen, G.J. Frederiksen, C.H. (1986) 'Differences between medical students and doctors in memory for clinical cases', <u>Medical Education</u>, Vol.20, pp 3-9.

Patton, M.Q. (1990) <u>Qualitative Evaluation and Research Methods</u>, 2nd edn, Newbury Park, California, Sage.

Payton, O.D. (1985) 'Clinical reasoning process in physical therapy', <u>Physical Therapy,</u> Vol.65, No.6, pp 924-928.

Petty, N.J. Moore, A.P. (2001) <u>Neuromusculoskeletal Examination and Assessment, a Handbook for Therapists</u>, 2nd edn, Edinburgh, Churchill Livingstone.

Pill, J. (1971) 'The Delphi method: substance, context, a critique and an annotated bibliography', Socio-Economic Planning Science, Vol.5, pp 57-71.

Polanyi, M. (1962) Personal Knowledge: Towards a Post-Critical Philosophy, London, Routledge and Kegan Paul.

Pope, C. Mays, N. (2000a) 'Qualitative methods in health research', in Pope, C. Mays, N. (Eds) Qualitative Research in Health Care, 2nd edn, London, British Medical Journal Publishing Group, pp 1-10.

Pope, C. Mays, N. (2000b) 'Observational methods in health care settings', in Pope, C. Mays, N. (Eds) Qualitative Research in Health Care, 2nd edn, London, British Medical Journal Publishing Group, pp 30-39.

Pope, C. Ziebland, S. Mays, N. (2000) 'Analysing qualitative data', in Pope, C. Mays, N. (Eds) Qualitative Research in Health Care, 2nd edn, London, British Medical Journal Publishing Group, pp 75-88.

Powell, C. (2003) 'The Delphi technique: myths and realities', Journal of Advanced Nursing, Vol.41, No.4, pp 376-382.

QAA. (1998) Consultation Paper on Qualifications frameworks: Postgraduate Qualifications, Gloucester, QAA.

QAA. (2001a) The Framework for Higher Education Qualifications in England, Wales and Northern Ireland, Gloucester, QAA.

QAA. (2001b) <u>Subject Benchmark Statements: Health Care programmes –</u>
<u>Radiography</u>, Gloucester, QAA.

Raja-Jones, H. (2002) 'Role boundaries - research nurse or clinical nurse
specialist? A literature review', <u>Journal of Clinical Nursing</u>, Vol.11, No.4, pp 415-
420.

RCN. (1997) <u>Nurse Practitioners: Your Questions Answered</u>, London, RCN.

Regehr, G. Cline, J. Norman, G.R. Brooks, L. (1994) 'Effect of processing
strategy on diagnostic skill in dermatology', <u>Academic Medicine</u>, Vol.69,
No.10(suppl), pp s34-s36.

Reid, N. (1993) <u>Health Care Research by Degrees</u>, Oxford, Blackwell Scientific
Publications.

Reischman, R.R. Yarandi, H.N. (2002) 'Critical care cardiovascular nurse expert
and novice diagnostic cue utilization', <u>Journal of Advanced Nursing</u>, Vol.39,
No.1, pp 24-34.

Rew, L. Barrow, E. (1987) 'Intuition: a neglected hallmark of nursing
knowledge', <u>Advances in Nursing Science</u>, Vol.10, No.1, pp 49-62.

Rivett, D.A. (1995) 'An investigation of the clinical reasoning behaviour of expert and student manipulative physiotherapists', Proceedings of the 12th International Congress of the World Confederation for Physical Therapy, Washington, p 460.

Rivett, D.A. Higgs, J. (1997) 'Hypothesis generation in the clinical reasoning behaviour of manual therapists', Journal of Physical Therapy Education, Vol.11, No.1, pp 40-45.

Roberts, A.E. (1996) 'Approaches to reasoning in occupational therapy: a critical exploration', British Journal of Occupational Therapy, Vol.59, pp 233-236.

Robertson, L.J. (1996) 'Clinical reasoning, part 2: novice / expert differences', British Journal of Occupational Therapy, Vol.59, No.5, pp 212-216.

Robson, C. (1993) Real World Research, A Resource for Social Scientists and Practitioner Researchers, Oxford, Blackwell.

Rolfe, G. (1997) 'Beyond expertise: theory, practice and the reflexive practitioner', Journal of Clinical Nursing, Vol.6, pp 93-97.

Rosch, E. Mervis, C.B. (1975) 'Family resemblances: studies in the internal structure of categories', Cognitive Psychology, Vol.7, pp 573-605.

Roskell, C. Cross, V. (2001) 'Defining expertise in cardiorespiratory physiotherapy', British Journal of Therapy and Rehabilitation, Vol.8, No.8, pp 294-299.

Rossano, M.J. (2003) 'Expertise and the evolution of consciousness', Cognition, Vol.89, pp 207-236.

Rowe, G. Wright, G. Bolger, F. (1991) 'Delphi: a re-evaluation of research and theory', Technological Forecasting and Social Change, Vol.39, pp 235-251.

Rushton, A. (2000) A Critical Analysis of Clinical Education in Physiotherapy Facilitated by a Soft Systems Methodological Approach, Unpublished research, University of Warwick.

Rushton, A. (2001) 'Clinical education in the health care professions: a critical analysis of the literature', Association for Medical Education in Europe, Berlin, Germany, 2-5 September. Oral presentation.

Rushton, A. (2002) An Exploration of the Characteristics of Masters Level Courses for Healthcare Professionals, Unpublished research, University of Warwick.

Rushton, A. (2003) 'A descriptive survey exploring the characteristics of Masters level courses aiming to develop clinical expertise in the UK', 14th International WCPT Congress, Barcelona, Spain, 7-12 June, Platform Presentation.

Rushton, A. Lindsay, G. (2003) 'Clinical education: a critical analysis using a soft systems methodology', International Journal of Therapy and Rehabilitation, Vol.10, No.6, pp 271-279.

Ryan, S.E. Esdaile, S.A. Brown, G. (2003) 'Appreciating the big picture: you are part of it! The socio-political influences on health practice in the public and private sphere', in Brown, G. Esdaile, S.A. Ryan, S.E. (Eds) Becoming an Advanced Practitioner, Edinburgh, Butterworth Heinemann, pp 1-29.

Sackman, H. (1975) Delphi Critique, Lexington, Massachusetts, Lexington Books.

Sandelowski, M. (1995) 'Sample size in qualitative research', Research in Nursing and Health, Vol.18, pp 179-183.

Sandelowski, M. (2000) 'Whatever happened to qualitative description?', Research in Nursing and Health, Vol.23, pp 334-340.

Scally, G. Donaldson, L.J. (1998) 'Clinical governance and the drive for quality improvement in the new NHS in England', British Medical Journal, Vol.317, pp 61-65.

Schmidt, H.G. Norman, G.R. Boshuizen, H.P.A. (1990) 'A cognitive perspective on medical expertise: theory and implications', Academic Medicine, Vol.65, No.10, pp 611-621.

Schon, D.A. (1983) The Reflective Practitioner: How Professionals Think in Action, London, Maurice Temple Smith.

Schon, D.A. (1987) Educating the Reflective Practitioner, San Francisco, Jossey-Bass Inc Publsihers.

Shepard, K.F. Jensen, G.M. Schmoll, B.J. Hack, L.M. Gwyer, J. (1993) 'Alternative approaches to research in physical therapy: positivism and phenomenology', Physical Therapy, Vol.73, No.2, pp 88-101.

Shulman, L.S. Elstein, A.S. Sprafka, S.A. (1978) Medical Problem Solving: An Analysis of Clinical Reasoning, Cambridge, Harvard University Press.

Silverman, D. (1993) Interpreting Qualitative Data, Methods for Analysing Talk, Text and Interaction, 2nd edn, London, Sage Publications.

Sim, J. (1986) 'Informed consent: ethical implications for physiotherapy', Physiotherapy, Vol.72, pp 584-587.

Sim, J. (1996) 'Client confidentiality: ethical issues in occupational therapy', British Journal of Occupational Therapy, Vol.59, pp 56-61.

Sim, J. (1997) Ethical Decision Making in Therapy Practice, Oxford, Butterworth-Heinemann.

Sim, J. Wright, C. (2000) Research in Health Care, Cheltenham, Stanley
Thornes (Publishers) Ltd.

Simon, H.A. Gilmartin, K. (1973) 'A simulation of memory for chess positions',
Cognitive Psychology', Vol.8, pp 165-190.

Simon, H.A. (1980) 'Problem solving and education', in Tuma, D.T. Reif, R.
(Eds) Problem Solving and Education: Issues in Teaching and Research,
Hillside, New Jersey, Erlbaum, pp 81-96.

Starkes, J.L. (1993) 'Motor experts: opening thoughts', in Starkes, J.L. Allard, F.
(Eds) Cognitive Issues in Motor Expertise, Amsterdam, Elsevier Science
Publishers, pp 3-16.

Sudman, S. Bradburn, N.M. (1982) Asking Questions: A Practical Guide to
Questionnaire Design, San Francisco, Jossey-Bass Publishers.

Sumsion, T. (1998) 'The Delphi technique: an adaptive research tool', British
Journal of Occupational Therapy, Vol.61, pp 153-156.

Tanner, C.A. Padrick, K.P. Westfall, U.E. Putzier, D.J. (1987) 'Diagnostic
reasoning strategies of nurses and nursing students', Nursing Research, Vol.36,
No.6, pp 358-363.

Tashakkori, A. Teddlie, C. (1998) Mixed Methodology: Combining Qualitative
and Quantitative Approaches, Thousand Oaks, California, Sage.

Thomas-Edding, D. (1987) 'Clinical problem solving in physical therapy and its implications for curriculum development', Proceedings of the 10th International Congress of the World Confederation for Physical Therapy, Sydney, Australia, pp 100-104.

Thorndike, R.L. Hagen, E.P. (1997) Measurement and Evaluation in Psychology and Education, 4th edn, New York, Wiley.

Titchen, A. Ersser, S.J. (2001) 'The nature of professional knowledge', in Higgs, J. Titchen, A. (Eds) Practice Knowledge and Expertise in the Health Professions, Oxford, Butterworth Heinemann, pp 35-41.

Travers, M. (2001) Qualitative Research Through Case Studies, London, Sage Publications.

United Kingdom Central Council for Nursing, Midwifery and Health Visiting. (1995) PREP and You, London, UKCC.

Walker, A.M. Selfe, J. (1996) 'The Delphi method: a useful tool for the allied health researcher', British Journal of Therapy and Rehabilitation, Vol.3, No.12, pp 677-681.

Watts, N.T. (1978) 'Special report - World Confederation for Physical Therapy', Physical Therapy, Vol.58, pp 363-364.

WCPT. (1995) <u>Declaration of Principle and Position Statements</u>, London, WCPT.

White, E. (1991) <u>The Future of Psychiatric Nursing by the Year 2000: a Delphi Study, Report</u>, Department of Nursing, University of Manchester.

Whitman, N. (1990) 'The committee meeting alternative: using the Delphi technique', <u>Canadian Journal of Nursing Administration</u>, Vol.20, No.6/7, pp 30-36.

WHO. (1983) <u>The Principles of Quality Assurance</u>, Copenhagen, WHO.

Whyte, D.A. Lugton, J. Fawcett, T.N. (2000) 'Fit for purpose: the relevance of Masters preparation for the professional practice of nursing. A 10 year follow up study of postgraduate nursing course in the University of Edinburgh', <u>Journal of Advanced Nursing</u>, Vol.31, No.5, pp 1072-1080.

Williams, P. Webb, C. (1994) 'The Delphi technique: a methodological discussion', <u>Journal of Advanced Nursing</u>, Vol.19, pp 180-186.

Williams, P.L. (1998) 'Using theories of professional knowledge and reflective practice to influence educational change', <u>Medical Teacher</u>, Vol.20, No.1, pp 28-34.

Winter, R. (1994) 'The problem of educational levels, part II: a new framework for credit accumulation in higher education', <u>Journal of Further and Higher Education</u>, Vol.18, pp 92-106.

Wolf, F. Miller, J.G. Bozynski, M.E. Schlesinger, A. Rosen, D.S. Weiner, G.M. Fliegel, J.E. (1994) 'Effects of experience and case difficulty on the interpretation of pediatric radiographs', <u>Academic Medicine</u>, Vol.69 (suppl), No.10, pp s31-33.

8.   APPENDICES

Appendix 8.1: Participant information Delphi study

Participant Information form, Delphi study

This Delphi study is part of a wider study that is addressing the following research question:

What are the agreed behaviours that are indicative of the construct of M level clinical practice?

The Delphi method is being used to define a domain of content for M level clinical practice through national consensus. It will explore whether consensus is possible within and across the different health care professions, identifying any existing variation.

You have been selected as a participant because of your expertise of M level clinical practice. This is through your role of Course Tutor for a course that aims to develop expertise and uses clinical placement of students as a teaching and learning strategy.

The Delphi questionnaires will be coded for the purposes of follow up, and you are assured that this is the only reason for coding. After the process of following up non-respondents the coding system will be destroyed.

Your informed consent will be assumed through your decision to complete and return the questionnaire.

The findings from the Delphi will be developed through a case study that will explore the construct of M level clinical practice in its real life context. This will be an in-depth study within one institution, using multiple methods of data collection from the qualitative paradigm.

4th December 2002

Dear

Re: Delphi study exploring the construct of M level clinical practice

Thank you for your continued support in agreeing to participate in a Delphi study. As explained in the participant information sheet, this study is aiming to explore the components of the construct of M level clinical practice.

Please find attached the first round of the Delphi questionnaire. It should take approximately 5 minutes to complete. If you have any questions regarding your participation, please do not hesitate to contact me.

Please return the questionnaire by the 20th December.

The results of this round will be collated to be returned to you in early February for the second round of the Delphi study.

Yours sincerely,

Alison Rushton
Lecturer
Tel:
Email:

**The University of Birmingham
School of Health Sciences**

Thank you for agreeing to participate in a Delphi study as described in the information sheet previously circulated. The Delphi study is part of wider research addressing the following research question:

What are the agreed behaviours that are indicative of the construct of M level clinical practice?

Please complete each of the three questions below, numbered i to iii.

i.   Please list a minimum of **10** behaviours that are assessed as indicative of M level clinical practice for your course.

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ii.   How easy was it to provide 10 behaviours?

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iii.   Any further comments?

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Thank you for your continued support and time.

18th March 2003

Dear

Re: Delphi study exploring the construct of M level clinical practice

Thank you for your continued support in participating in this Delphi study.

Feedback on round 1:
The information that you submitted in round one contributed to the list of behaviours that participants felt reflected the components of the construct of M level clinical practice. This encompassed a range of behaviours that reflected the many aspects of clinical practice. The aim of the second round is to rate the importance of each behaviour to the construct of M level clinical practice. This will enable justification of the inclusion of the individual behaviours into the third round.

Please find attached the second round of the Delphi questionnaire. Again, it should take approximately 5 minutes to complete. If you have any questions please do not hesitate to contact me.

Please return the questionnaire by the 4th April 2003.

The results of this round will be collated to be returned to you in May for the third and probably final round.

Yours sincerely,

Alison Rushton
Lecturer
Tel:
Email:

The University of Birmingham: School of Health Sciences

Thank you for continuing to participate in the Delphi study that is addressing the following research question:

What are the agreed behaviours that are indicative of the construct of M level clinical practice?

Please complete each of the four questions below, numbered 1 to 4.

1. Please rank the importance of each of the following behaviours to the construct of M level clinical practice, by placing a √ in one box.

	Not very important 1	2	3	Important 4	5
Demonstrates synthesis of materials from a variety of Sources	☐	☐	☐	☐	☐
Demonstrates a high level of management skills	☐	☐	☐	☐	☐
Demonstrates critical use of evidence to inform practice	☐	☐	☐	☐	☐
Demonstrates a high level of clinical skills	☐	☐	☐	☐	☐
Demonstrates a high level of clinical reasoning skills	☐	☐	☐	☐	☐
Demonstrates critical analysis in approach to practice	☐	☐	☐	☐	☐
Demonstrates analysis of concepts / arguments	☐	☐	☐	☐	☐
Demonstrates justification of examination procedures	☐	☐	☐	☐	☐
Demonstrates advanced problem solving	☐	☐	☐	☐	☐
Demonstrates evaluation and audit of clinical practice	☐	☐	☐	☐	☐
Demonstrates autonomous / independent practice	☐	☐	☐	☐	☐
Demonstrates advanced knowledge of subject area	☐	☐	☐	☐	☐
Demonstrates a high level of communication skills	☐	☐	☐	☐	☐
Demonstrates involvement in formal teaching	☐	☐	☐	☐	☐
Demonstrates advanced formulation of diagnosis / problem list	☐	☐	☐	☐	☐
Demonstrates contribution to clinical research / evidence base	☐	☐	☐	☐	☐

Demonstrates a high level of decision making skills ☐ ☐ ☐ ☐ ☐

Demonstrates a high level of self evaluation and identification of individual learning needs ☐ ☐ ☐ ☐ ☐

Demonstrates effective engagement in multiprofessional situations ☐ ☐ ☐ ☐ ☐

Demonstrates motivation to advance knowledge ☐ ☐ ☐ ☐ ☐

Demonstrates independent learning ability ☐ ☐ ☐ ☐ ☐

Demonstrates advanced analysis of data ☐ ☐ ☐ ☐ ☐

Demonstrates a high level of communicating conclusions ☐ ☐ ☐ ☐ ☐

Demonstrates creativity and innovation of practice ☐ ☐ ☐ ☐ ☐

Demonstrates advanced professionalism ☐ ☐ ☐ ☐ ☐

Demonstrates adaptability of approach to fit new situations ☐ ☐ ☐ ☐ ☐

Demonstrates a high level of reflective practice ☐ ☐ ☐ ☐ ☐

Demonstrates awareness of complex issues E.g. resource allocation, ethical and legal considerations ☐ ☐ ☐ ☐ ☐

2.   Are there any behaviours that you would add to the above list?

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3.   Is there any wording that you would change in the above behaviours?

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4.   Any further comments?

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Thank you for your continued support and time

4th June 2003

Dear

Re: Delphi study exploring the construct of M level clinical practice

Thank you for your continued support in participating in this Delphi study.

Feedback on round 2:
The ranking of the importance of each behaviour in round 2 contributed to the list of behaviours that participants felt most reflected the components of the construct of M level clinical practice. All of the behaviours listed received a mean ranking of greater than 4 (scale 1 - 5). Analysis of your responses to the open questions in round 2 also enabled refinement of wording and clarity of each of the listed behaviours.

The aim of the third and final round is to rank the importance of each behaviour to the construct of M level clinical practice. Please rank each of the behaviours from 1 to 21 as to how important you perceive them to be to the construct. Please place a number in the box, from 1 (most important) to 21 (least important). Please do not allocate the same rank to more than one behaviour. This process will enable some prioritisation of the behaviours, an issue that several of you suggested would be useful / important.

Please find attached the third round of the Delphi questionnaire. Again, it should take approximately 5 minutes to complete. If you have any questions please do not hesitate to contact me.
Please return the questionnaire by the 4th July 2003.

Thank you again for your assistance in this research. If you would like a copy of the abstract when I have completed the analyses, please tick the box on the end of the questionnaire.

Yours sincerely,

Alison Rushton, Lecturer
Tel:
Email:

The University of Birmingham, School of Health Sciences

Please complete each of the four questions below, numbered 1 to 4.

1. Please rank each of the following behaviours from 1 to 21 as to how important you perceive them to be to the construct of M level clinical practice.
Please place a number in the box, from 1 (most important) to 21 (least important).
Please do not allocate the same rank to more than one behaviour.

Demonstrates synthesis of materials from a variety of sources ☐

Demonstrates critical use of evidence to inform practice ☐

Demonstrates a high level of clinical skills ☐

Demonstrates a high level of clinical reasoning skills ☐

Demonstrates critical analysis in approach to practice ☐

Demonstrates analysis of concepts / arguments ☐

Demonstrates justification of examination procedures ☐

Demonstrates advanced problem solving ☐

Demonstrates evaluation and audit of clinical practice ☐

Demonstrates autonomous / independent practice ☐

Demonstrates advanced knowledge of subject area ☐

Demonstrates a high level of communication skills ☐

Demonstrates a high level of decision making skills ☐

Demonstrates a high level of self evaluation and identification of individual learning needs ☐
Demonstrates motivation to advance knowledge ☐

Demonstrates independent learning ability ☐

Demonstrates a high level of skill in communicating information ☐

Demonstrates creativity and innovation of practice ☐

Demonstrates adaptability of approach to new situations ☐

Demonstrates a high level of reflective practice ☐
Demonstrates awareness of complex issues
E.g. resource allocation, ethical and legal considerations ☐

2. Do you have any comments on the process of ranking?

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3. How do you feel that M level clinical practice sits in relation to the clinical grading structure within the NHS?

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4. Any further comments?

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Please tick here if you would like a copy of the abstract of this research when it is complete

Thank you for your continued support and time.

INTERVIEW GUIDE: STUDENTS

Welcome and thank you for participating.

Statement of purpose
"As you already know, I am carrying our some interviews and observations related to Masters level clinical practice. I am therefore interested in your views / ideas as a student undertaking the clinical experience on placement from this course".

Private and confidential.

Do you mind if I tape our conversation? It helps me remember it afterwards and saves me taking notes.

Happy to go ahead? You can withdraw from the study at any time.

Now first of all, would you like to tell me a little about yourself and your involvement with this Masters course.
- ➤ Details of involvement with course:
  - o Time? FT or PT?
  - o Prior study?
- ➤ Background of student
- ➤ Placement experience:
  - o Preparation of students?
  - o Student involvement?
  - o Format of a typical day?
  - o Nature of relationship with clinical mentor?
  - o What strategies are helpful to your development?
  - o Role of the student?
  - o Distinguishes as M level?
  - o Comparison to level 3 / undergrad?
- ➤ Assessment of student:
  - o Formative?
  - o Summative?
- ➤ Behaviours of M level clinical practice?
- ➤ Ranking of importance of behaviours?
- ➤ Strengths of students?
- ➤ Weaknesses of students?

"Well, I think that we have covered everything that I need to ask you, thank you very much"

"Do you have any questions?"

Close

INTERVIEW GUIDE: CLINICAL TUTORS

Welcome and thank you for participating.

Statement of purpose
"As you already know, I am carrying our some interviews and observations related to Masters level clinical practice. I am therefore interested in your views / ideas as you contribute to the clinical experience for students coming to you on placement from this course".

Private and confidential.

Do you mind if I tape our conversation? It helps me remember it afterwards and saves me taking notes.

Happy to go ahead? You can withdraw from the study at any time.

Now first of all, would you like to tell me a little about yourself and your involvement with this Masters course.
- Details of involvement with course:
  - time?
  - no of students?
- Background of Clinical Mentor:
  - Masters?
- Model of placement:
  - 2:1?
- Preparation for your role?
- Placement experience:
  - Preparation of students?
  - Student involvement?
  - Format of a typical day?
  - Nature of relationship with student?
  - What strategies are helpful to development?
  - Role of the student?
  - Distinguishes as M level?
  - Comparison to level 3?
- Assessment of student:
  - Formative?
  - Summative?
- Behaviours of M level clinical practice?
- Ranking of importance of behaviours?
- Strengths of students?
- Weaknesses of students?

"Well, I think that we have covered everything that I need to ask you, thank you very much"

"Do you have any questions?"

Close

Participant Information form, Case study

This case study is part of a wider study that is addressing the following research question:

What are the agreed behaviours that are indicative of the construct of M level clinical practice?

The case study will develop existing findings from use of the Delphi method to explore the construct of M level clinical practice in its real life context. This is an in-depth study within one institution, using multiple methods of data collection from the qualitative paradigm.

You have been asked to participate because of your involvement in the processes of teaching and learning, clinical mentorship / supervision or clinical assessment at the selected institution. The emphasis of this study is gaining an in-depth understanding of the components of M level clinical practice.

It is anticipated that the data collection methods will include interviews and participant observation. As the decisions regarding methods to be used are expected to evolve as the study progresses it is impossible at this stage to be precise on this issue. However, prior to your involvement in the study the exact nature of the research method being used will be explained in detail prior to gaining your consent.

Interview (Placement 2, student)

Researcher: Alison Rushton
Interview: ISK

Researcher	Okay, just to start us off, tell me a little about your background and what you've done musculoskeletal wise before you started the course.
Participant	Ok, well I trained up at (named university) and I qualified in 97 when I came down and did my Juniors at (named hospital) and I was there for 18 months and did musculoskeletal outpatients rotation and other stuff, and then I went straight to work for a private company on Regent Street where they had an NHS contract for North London GPs and I did a morning domiciliary, two GP clinics out in the GP surgery and then I'd go to some clinics in the centre with duty patients and then I started to do some private patients within the clinic and by the time I left, which was about, 18 months 2 years after I started there I was seeing probably half and half and then I went to work erm for another company, another private company based in two different gyms in the city doing just purely private then and nothing NHS at all. I suppose with a bias on spinal work related problems and sports injuries. I was about 2 years there.
Researcher	Why were you interested in doing a Masters course?
Participant	To take myself to the next level really with my understanding, my knowledge and general practice really I'd been, I've always done a lot of ongoing different education myself, going on weekend courses, I organise a CPD programme. The second private company I worked for I set up a bi-weekly, bi-monthly sort of session with people coming lecturing and having budgets through courses and everything for us as a group, so I've always been really trying to keep my, you know, my education going so it just seemed like the natural next sort of step really.
Researcher	And why a Masters course rather than say, a combination of weekend courses?
Participant	Erm, one, I wanted to do it fulltime because I like to go and apply myself to something that I can really immerse myself in, but also I wanted to do something that was quite academic because I enjoy that side of things as well as the clinical. The (named course) Masters seemed to have both those elements plus a strong science base and academia base. And I could do with many of those angles and the very heavy practical based as well and the research and I wanted to learn more about research and about how to read papers and how to critique papers, and those kind of things and so then I would learn. And also with a Masters because of the opportunity that it would hopefully give me in the future really because I would like, maybe in the future to teach either on a course, physio course or just being a teacher for the NHS and teaching undergraduate students. Just being able to perhaps go more into like a clinical specialist role, and I felt it would be useful.

Researcher	Yes, so the Masters would be useful to facilitate those opportunities?
Participant	Yes, so I take that and it gives me more opportunities and it will give me more scope, give me more choice and I think for teaching particularly I think it's quite useful if you get a Masters.
Researcher	Yes, you are absolutely right. Ok thinking about the placement itself, thinking about your first placement to start with, you've had a period within the university from a fulltime course,
Participant	Yes, that's right,
Researcher	So you had a very intense period within the university, and then you went on placement. How did you feel about your preparation for that placement based upon what you had done within university?
Participant	Erm, I felt that things like just basic patient assessment skills has probably got rusty and we hadn't done any kind of practice of those skills. We had done an awful lot of treatment techniques and different kinds of treatment techniques and had done days on the shoulder etc, etc, but the treating of, but the whole kind of, just subjective objective kind of getting, doing the actual assessment was quite horrific the first days, a bit of a kind of you know, in at the deep end.
Researcher	Yes.
Participant	You kind of forget to ask the most obvious questions that you automatically ask once you've been doing it for a couple of days, but I mean it was literally just getting back into it for a couple of days really.
Researcher	And how did you feel about your experience across the whole of that first placement?
Participant	At the time it is actually traumatic and horrible, you feel like you are being ripped apart and sort of pulled apart and put back together again, I suppose, which is kind of what we are trying to do, because we are trying to sort of break down what we are doing and kind of thinking about very fine details, like why you do everything and why you ask that and why you behave in a certain way and I think erm, quite a focus is to try and look and get everything right, you want to get everything right, you know, if I don't get it right then I get cross with myself and I find that really quite hard erm, but in retrospect you look back on it and just like, you know, learnt so much and it changes your practice hugely, it changes the way you have been thinking the way you think massively. Erm, that's the whole point. (laughter)
Researcher	Where were you on placement?
Participant	I was actually, up just outside (named hospital).
Researcher	Yes, and you enjoyed that experience?
Participant	It was brilliant, I mean I had two separate sort of senior clinicians who were kind of like, mentor for me and that was excellent. At first I was a bit worried that that would be a bit kind of bitty but it actually turned out to be a benefit really, because I felt I got more because I got two completely different peoples' input and they both had strengths that you know, I could draw on and yeah, that worked out really, really well, and the department there was just excellent, fantastic, all physios very dynamic all really kind of progressive and you know.
Participant	It was very nice to go there, it was lovely, I was very lucky.
Researcher	And then following that placement, you a period back in the university for a week and then you had a break. How do you now feel about

this placement so how did that all prepare you for this second placement?

Participant That I felt has been probably, the worst, kind of bit the way things have been organised I found it really, really, I'm finding it really difficult because we had a month off and then we got 3 weeks back here and then we've got a week back in university where we are doing revision sessions and then we will be straight to our exams. So there's a few things really, whether, you know, having revision session a week before, the week before your exam starts, to me seems almost, a bit pointless because by then I'd rather, you know, it's not too late but you know, it's hinted that irrelevant erm so having a month where you then revise like mad and you have to really push yourself really hard trying to revise for the exams and then you do 3 weeks where you can't really do any revision and your meant to book a new placement but you haven't thought about clinical for at least a month and you try to just revise academic subjects and you come back here and all of a sudden you've got to start thinking about assessing somebody. I found that really, really difficult and I find that really difficult and I don't think it's very well structured at all I think it makes it so distressing and I think it means that you do neither very well and I think the problem is you probably do, you don't do very well in your placement, can't focus on your placement, you don't have the time in the evenings to read up for your placement which you want to do, because you are going home and trying to revise and you are just terrified that you would have forgotten everything that you tried to learn a month ago when you go into the exams. I just think it's really (pause)

Researcher Stressful?

Participant Yes, could be better. But I'm sure there are lots of reasons for it this way, but (pause)

Researcher It's not fathomable at the moment?

Participant Well, I'm sure it's all logistics and that but you know, (pause)

Researcher So, looking at the preparation for this placement, for you there is big issue in that you can't carry over what you had from your first placement?

Participant No, because you've chucked it, well not chucked it out, but you've definitely stored it into a different part of your brain and you've really been focusing completely on learning about osteoblasts and osteophytes you know, and proteoglycans, and then I come here and it's like, ok now I've started assessing someone's shoulder and bringing the two together I know, is something that we do with the patient focused essay. And that's good, I quite like that, but it doesn't really help you with the placement.

Researcher Yes, ok, thinking about this placement now, in a bit more detail, you said on the first placement you had two tutors supervising you. Here you've got three, how have you found that?

Participant It's fine, I mean they are very very good in the way it's organised, back to each other all the time when they all seem to be involved as to what is going to erm with each other then again they have all got their own personalities and their own experiences and stuff so you know, you do benefit from that, yes. Yes it's great because we've got (named clinical tutor) whose just got a waft of experience and is just

	like an absolute Master, and then you know then, (named clinical tutor) and (named clinical tutor) are just brilliant seniors and they have both got that sort of personal you know, clinical things that they do their specialities and stuff really, you can kind of benefit from all of those. It's not been a problem, no, never not at all.
Researcher	But you do actually see that as a benefit?
Participant	Well, I think so, yeah. So long as they are well organised and communicating as they are doing here. You can imagine it could be an absolute disaster if one did not know what the other one was doing, or we had complete different views that would be a problem as well, but it appears here they have a fairly uniform approach to things.
Researcher	Yes, great. Thinking about the structure of your day, how would you describe the typical day, what sort of things do you do / are you doing as the day goes through?
Participant	Well, we are doing, on this placement, we have done a lot of assessing of new patients and watching, observing each other and discussing the assessment process, and doing some assessment techniques, and that has probably been the majority of my work really and then we do follow-ups.
Researcher	How about change as the weeks have gone through, you are now at the end of your second week, is it different to your first week?
Participant	Yeah, the first week we just watched and assessed and we asked if we could have some practical sessions, because we felt that we weren't really doing an awful lot really. We seemed to spend all day and maybe treat one person and watch somebody else treat one and we didn't really feel like we were doing an awful lot and not really learning an awful lot of hands on stuff, so then, we asked to put in the chance of that - so very flexible really.
Researcher	And you find that usual?
Participant	Yes, definitely, we did one really good session yesterday, which was erm I had to be a pretend patient and (named student) had to assess me and it was really the subjective what we were looking at, which was something different from my last placement. We have really looked at the subjective a lot more, for the last one it was the objective and I'm quite happy with our objective but it was the subjective we really wanted to do. And you know, we did that and that was excellent, so from the point of being a patient for me, was just a real eye opener, I've never been on the other side of the fence.
Researcher	A bit hard isn't it?
Participant	It is really funny, because she was asking questions and I was just "Well, I don't know" and this is the sort of response you get from your patients, and your like "oh, but you must know" you know, "what does it feel like?" and it's like "well, I don't really know" and I was drawing from a personal experience, you know a real pain I had had and just couldn't, I was really useless and an awful patient, I was terrible. And I was like, I must never get cross with my patients ever again, or irritated for not giving what I want to hear.
Researcher	The nature of what you have done on this placement, is that similar to the first one?
Participant	No, they are quite different, actually.
Researcher	In what way?

Participant	Erm, the first placement, just the way that the questions that, questions you and stuff, like the first placement, I had one supervisor who was really clever at the way he questioned you, he would sort of go "ok, so what did you do?" and you would say "well I did this" and he'd ok, so what made you think, you know, why did you do that? What led you to that? What was it that made you say that or do that? You know, what are you thinking in terms of different things like pathologies or nature. I don't know he just had a really clever way of facilitating your learning but not critically, he would never be critical, never said that you did something that was wrong or wasn't right or he always kind of made you come to your own conclusions about where you could maybe improve things, he was just so clever. I don't know what he did or how he did it, but he was very, very clever.
Researcher	He just had that ability to draw that out of you?
Participant	Yeah, he was just sort of, you know, so what were you thinking? So you'd have to talk through your thought process, then and I think and instead of just saying "well I did it because, I did" you have to kind of think, well why did I do that? What was I thinking? And sometimes you weren't thinking, you know, and that was an education in itself (laughter). I did because, well that's what you do don't you, because I've been told to or someone showed me and you know, and you suddenly think, and erm, and he was very good, whereas here, I don't know it's been different, and I don't know why it's different and I don't know whether it's just the facilitators or whether it's me and where I am and my kind of mentality and my attitude, with everything at the moment and it's probably a combination, and it's that I don't, it's awful, I don't feel like I'm getting as much out of this placement and I really don't feel like I'm getting anything out of it and I'm just hoping that I'll pass. Isn't that awful? But it's really sad and I'm really quite yeah quite disappointed actually. Erm, I just can't, I don't feel like I'm getting much out of it or that I'm learning anything really, whereas I felt I learnt so much in my first one.
Researcher	Any other differences between the two placements, that you can articulate that might explain that? (pause)
Participant	Erm, again, I think I was really spoilt on the first one, I think that was kind of the problem really, because the two people I was with on the first one, their knowledge level was just awesome, there wasn't anything they didn't know, whereas I've had a run in, with often occasions when maybe I might know more than the people here and that is different, you know, I'm not used to being the one who perhaps knows a bit more about something, whereas in my other placement I didn't have that. So that's different and so yeah.
Researcher	I'll help you with that. I will come at it from a slightly different angle. Thinking about this placement, what strategies have been used to help develop your learning? You have given me a couple of them already, because you have talked about observations, the way they've observed what you've done and then talk you talk that through afterwards. You also said the role play. Were there any other strategies that have been used here to try to develop your learning?
Participant	No, there hasn't – that's it. Whereas on the last one we had lots of strategies.
Researcher	Such as?

Participant	Well you would go and do your subjective and come out and we had like a little piece, we had a kind of form thing that we filled out that had those questions - so what do you think SIN is? What is the nature etc? and then you had to fill it out and keep and reproduce it, and all these different little questions and then you went back and did your objective and came out and filled that on another piece of paper which said have you changed your mind about this? You know, what are your 'musts, should and coulds', that I think was kind of quite organised and see my notes as well, because me notes were a bit of bombsite erm, (named clinical tutor) really kind of helped me get everything really organised and she really helped me get my notes in order and that really helped my clinical reasoning processing massively. I found that, that was one of the best things, just getting my notes sorted whereas here they changed the way I was doing things and, you know, like, in the last place I had, you know, I had a body chart and on the chart I had my symptom areas and I had my pain areas and everything and set of questions and then on another body chart on the back I had, like you know, present conditions. I came here and it's like "oh no, we don't want that item, we don't want that there, we want it on the normal assessment sheets" and that to me did not feel good because it all sort of gets a big mush and then I don't know, I can't see things clearly and erm, my subjective on the first placement was absolutely fine. I never had any problems at all with my subjective. And now my subjective is just a complete disaster area and it feels like I've gone backwards so it's really confused and we've tried to change things around and put in social history before present history and condition, and just change it around and I'm finding that really difficult, it really kind of destroys me, so I feel like my assessments are a lot worse now than they were before.
Researcher	Ok, any other strategies that you used on the first placement?
Participant	Erm, well sorting out my notes, erm, getting help with the proformas and chatting about patients afterwards erm, we didn't spend so much time watching each other in fact we hardly watched each other at all. We did have some times where you would be by yourself, whereas here you're watched constantly, erm rather than watching the other person, you would be getting on with something which was quite nice in a way because it gave a bit of time where you could actually think and then every day we had sessions, practical sessions for things, for different techniques and then every morning we would go, I would come in and I already knew there would be practice time and then I would read about different things, so I had lot more time in the evenings to do, you know, spent loads of times learning all the nerve roots and courses and everything and I spent loads and loads of time reading articles about different treatment techniques and tests and validity and all that sort of stuff and I haven't done any of that this time.
Researcher	Yes. Have you done the practice sessions with other students this time ...or?
Participant	Well, she can't come in early so we can't do that, but then the afternoons, which we have had kind of half days, but actually I've only had one - this is our second one today, erm but you know we do yeah. It's only a 3-week placement and we've had two bank holidays,

and that kind of really limits it, really short time. And (named student) is, has got a lot of pressure on to do some revision because she hasn't really been able to get things together over the last month and she is really, really like, all she wants to do is do some revision, and she's not interested in the placement really, and you know she just wants to get on with her revision and she feels that the placement and stuff is kind of in the way, you know get this out of the way, I just want to revise.

Researcher So that's really limited what the two of you do?

Participant Yeah, so she is not kind of really, kind of wanting to do much, yeah.

Researcher A slightly different focus now. How would you describe your relationship with the clinicians while on the placement? What have been the characteristics of that relationship?

Participant With this one or the other?

Researcher If it's different, start with this one?

Participant With this one?

Researcher Yes.

Participant With the different people?

Researcher Again, if it's different depending upon the person or some sort of things that characterises the placement. To help you with it, if you think back to your undergraduate experience, when you went on a placement, is it a similar relationship when you were an undergraduate student or is it a different relationship?

Participant Quite different, very different actually.

Researcher In what way?

Participant Well, you're not so much a student. You're not the little student anymore, you're not, the kind of not going to know nothing kind of student, so it's much more of a erm, equal relationship I'd say, it's much more about you're very much more in control of the placement and kind of what you do and how you want to do things, up to a point and sort of it's much more about discussing issues and there not necessarily being a right or wrong way of doing something, you're just having a bit of discussion about why you want this and why you might choose to do them both at different times with different people and just sort of talking about that kind of thing yes, it's much more kind, of I'm trying to think of the right word, and I can't, it's completely gone out of my head but it's erm it's much more on a level.

Researcher Thinking about your practice at the moment and the fact that you are doing the Masters course, what do you think characterises the way you practice at Masters level, what is it about your practice that is at Masters level?

Participant That you are less recipe driven. You're much more adapting things to person / patient, you're much more, you know, really not interested anymore in sort of just ticking the boxes through this, this and this and going through this checklist and there is everything you must check and doing it 3 times and, you know, take the average it's much more about yes, being much more adaptive to the person and much more sensitive to their needs and what is appropriate to do with that person, so like you know, the subjective picking up what issues it has for them much more functionally led you know, how it is impacting on their life and you know, and then that then drives your objective and sort of brings it together and your management as well, how you

	manage the process. And then drawing from a much larger base of previous experience which you obviously don't have, you know you've got that five years or whatever of experience that you've had and your pattern recognition of things is stronger but then trying, making sure your are not masked by that as well, that your not kind of "oh well, that's such and such and therefore" you know and taking it for granted. And also it increases the amount of knowledge that we have now and much more knowledge about why have we got that pain, pathology and processes and perceptions and more psychology and everything and just all the extra learning that you've had.
Researcher	Anything else?
Participant	Erm, just your handling skills, you know it's much better, you are much more sensitive. I think erm, yes your tests become much more reliable.
Researcher	Ok, thinking of all those things that you've given me, is there any one aspect of that that you think is the most important feature at Masters level? Or is it that they're all equally important?
Participant	I think they are all important but I think it's, it's just the biggest thing really is the specificity of it so you are not doing superfluous things. I think I asked a lot of superfluous questions when I think back and did a lot of things that really weren't telling me anything at all, whereas now I think I'm much more, hopefully, I'm kind of much more, erm, I think I know why I'm doing things and I know what I'm looking for and then I use that information to decide how that's going to change or you know, in terms of my management or my treatment. It is just much more thought through I think.
Researcher	Yes, same sort of thing, but from a slightly different angle, when you have finished the course and you go back to clinical practice, what do you think are going to be your strengths that you will take back to into practice? So what are the things that you feel really happy about?
Participant	Erm, I think my knowledge is just, has improved massively and I think it's also sort of broadened as well, I think I erm, I've taken in a lot more sort of erm, different subjects, I suppose I kind of have more appreciation of the biology and pathologies, so I would, just my medical knowledge has improved a lot and erm I think my, I think my assessment skills are a lot lot better you know, I'm sure that's just, you know the kind of pressure that we are under my assessments are going to be a lot better, I'm not just going through a process.
Researcher	And what do you think will be your weaknesses that you need to keep getting help in?
Participant	To make sure that I don't slide back into my old habits (laughter) and just do things in the same way that you have always done it erm, so I think that's going to be my main aim when I finish this, just to make sure that I try to incorporate things that I've learnt you know, probably a one thing a week kind of thing. Do it differently, erm, I think, keep on logging onto the internet and reading the journals and following things that interest me to like give me facts, you know how it relates to research for example what the signs of osteoporosis might be. That kind of stuff on that kind of hard drive sort of level and actually making sure that I continue doing that, because that's where new ideas come from, you know, I'm sort of realising, you know all the

kind of pain stuff has been around for centuries, all the research, but nobody was really reading it and incorporating into physiotherapy, so I think we need to keep in touch with all the hard sciences and see what's going on in the world of pain and in the world of medication and things and then actually incorporating what might be relevant for what we do.

Researcher   Yes, final question, just thinking about the assessment process, how did you feel on the first placement about the assessment focussed to two returning patients as the way of assessment at that point?

Participant   Well, I hate assessments, because I don't know whether, in some ways, I often think that it would be nice if the clinician could grade you on your performance over the whole placement, because I think that would be a much more a true reflection of what you are like and I think putting anybody in a stressful situation for one or two patients is flawed in a way, because you are not getting a true representation of what that person's abilities are, and you are being assessed by your clinicians and by a visiting clinician. So it wouldn't even, you know they could assess you over the 3 weeks and give you a grade on it, I think that would be much nicer in a way because you wouldn't have the stress and why would you have to go through the stress? (laughter). I don't think it's necessary, you know, I don't see the reasoning behind it. If you can only be assessed by it that's fine, but you can be assessed by different ways by much more, kind of, continuous assessment.

Researcher   Yes, would you say the same about this placement?

Participant   Yes, definitely.

Researcher   What about the idea of assessing the new patient and the returning patient?

Participant   I think that's good, I think that's good, because they have different elements to them, you know, you might be the best assessor in the world, but then haven't got a clue what to do with them or how you are going to manage them and how you going to progress them. And I think your follow-up really shows this, you obviously see all the notes and stuff and see all the follow-up that you'd done before they come in for that so the actual value that you've got all that you need, you see the progression and what thought processes are behind reassessing and managing, whereas the actual assessment is about getting the information and you know, getting the baseline and all those sort to things, checking things that you may need to be concerned about, and all those issues. But I think they could be assessed throughout the placement rather than putting people under pressure and making people, giving people stress.

Researcher   Ok, right that's the end of my list of questions, is there anything else that I haven't given you the opportunity to talk about that you think fits into the areas that we have been talking about? (pause) Anything else that you think is relevant?

Researcher   No, I think the erm, having the placements in the Masters, Masters sort of course, and having this placement, is really really important, so I think it's really, really important because you can go and learn things from books and you can go on courses and things but there is nothing like being here with people watching you and then talking about what you have done, there is no learning experience that

	recreates that, it's just completely unique. And it is incredibly challenging and it really changes what you do, it really fundamentally changes what you do, and it is awful but in retrospect, it is fantastic, you know what I'm saying?
Researcher	I do know exactly what you're saying.
Participant	Yes, I think it's absolutely imperative and I think it should never be stopped you know, it should always be a really important part of your Masters, definitely, for physiotherapy yeah, it kind of ties it all together.
Researcher	Ok, thank you.

END OF INTERVIEW

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Interview – Placement 1 Clinical Tutor

Researcher: Alison Rushton

Interview: ICTS

Researcher: Ok, just to start us off, how long have you been involved with the (named course)?

Participant: Just, this is my first experience of co-tutoring this placement, so I haven't had any involvement.

Researcher: And have you done any other placements for any other courses?

Participant: No,

Researcher: No, so this is your first placement you've had?

Participant: Yes.

Researcher: So that gives you a good insight into it then?

Participant: Yes, yes.

Researcher: And tell me a bit about you and your background that then puts you in a position to take the students on placement.

Participant: Well I qualified in 89 and erm, sort of began to specialise in musculoskeletal outpatient work and erm did do the self directed MACP training at the (named hospital) with (named clinical tutor) and they were great kind of in-house training, got there for 2 years. Quite a few people didn't go on to do the exams, I did a lot of the work, did my two clinical placements, erm but didn't go on to do the exams, for various reasons. And then I came here to work at (named hospital) in 93 as a senior I in outpatients, so erm and I've worked and then I, again actually we ran, started to run, as (named physiotherapist) was here, as a sort of part time lecturer, so we started to run some in-house training for senior IIs so even though I hadn't, sort of qualified, with my MACP, I had sort of helped to teach them or to prepare them erm, but again I hadn't followed through with the exams. And then I erm, started to branch off a bit into paediatric musculoskeletal, mainly because we had a Consultant who sort of started, who you know, we had lots of referrals come into the department and you know, I tended to see them and to cut a long story short the funding was sort of provided to build up to ESP paediatric orthopaedic post which I came back to part-time after maternity leave.

Researcher: Yes.

Participant: So that's what I've been doing sort of past 5, 6 years now, so I have kind of branched off to the paediatric side predominantly but still see some adult musculoskeletal and then, I say, I've done my MSc in pain management, which didn't involve any clinical placements.

Researcher: What Masters did you do?

Participant: Pain, at (named institution).

Researcher: (Named institution). Yes.

Participant: So I finished that last year.

Researcher: Great. Have you followed your MACP now through to exams or still not?

Participant: No, no.

Researcher: Do you think you will do it at any time?

Participant: No, I won't, you know I gained masses from doing it, the whole kind of.. (pause)

Researcher: Yes, it gave you what you wanted.

Participant: Yeah, and you know, it did, yeah. At the time it sort of, it wasn't matching, the work I was doing to prepare for the exams wasn't matching how my clinical practice was going so I became a bit disillusioned that you are sort of trying to actually do things to pass an exam which you weren't doing in the practice, and I'm sure that you know, it's moved on a lot from then it's just the stage it had been at. So I don't feel that I need to do that.

Researcher: So thinking about this actual placement then, when the students first came out on placement how did you feel about their preparation for the placement at that point in time?

Participant: I think they both didn't know what to expect in terms of how the placement would go and how busy they would be and erm so they were both pretty nervous the first day and wanted to know how really the weeks would go and how much time we would be able to discuss. I mean in terms of reading and preparation I, neither of them mentioned that they had done anything specifically to prepare for the placement, but we tried early on on the first day to talk to sort of talk to them about their background and what areas they've worked in so that we knew any kind of gaps that they might need to help them with over the course so, erm, so I think they didn't know what to expect but quite early on managed to communicate the areas that they felt they wanted to sort of develop.

Researcher: Great. And from the modules they'd done in University do you feel the modules prepared well to come out on placement at that time?

Participant: Yes.

Researcher: Does that come through at all?

Participant: Yes, I think erm because they both had made some you know, slightly different choices, one hadn't done the pain module and felt that would have been useful, and he was struggling a bit to begin with because you know, they were trying to talk and reason through pain mechanisms and the patients, and you know we found he was struggling a bit with that, but erm so I think that would have been, it's a difficult one, I know it's an optional module but I think it's one that is quite essential to coming out on most type of placements, but otherwise, yeah, I think the rest of it prepared them reasonably well.

Researcher: Ok, and how have you felt working with the students when there have been two of you supervising, you've been working together do you feel that's worked well?

Participant: Yes, I think on balance we've talked about it a lot before hand, (named clinical tutor) and I because (named clinical tutor) had first sort of mentioned to me that you know, was I interested in doing it and I had, I had reservations really about myself and was I able to because a) because I haven't done my, you know, I'm not an MACP member was that a problem? And because I've sort of branched off into paediatrics are my kind of adult skills as up to date to help them reason through their patients, and we talked quite a lot about it and erm we felt that because we both had quite different strengths if

you like, and maybe the gaps that I had were the things that (named clinical tutor) was stronger at, we hoped that it would complement.

Researcher: A good combination?

Participant: Yes, yes.

Researcher: And have you found that working through the placement from your perspective?

Participant: Yes, as far as I can tell, it seems to have worked well and again we, we don't at the same time we do not have any massive conflicting areas of sort of clinical practice, so erm it may be because of that, because our strengths are slightly different, so I think that has gone well. We have been able to talk quite freely, openly honestly to each other.

Researcher: Yes.

Participant: Well, I hope it's well, I hope it's worked well for them because that was a worry that we jointly had, and probably me, you know I felt more so worried on just a personal level, but I kept reminding myself that I kept thinking the idea is to facilitate their learning and not necessarily you know, hopefully I've got those skills through my years of experience and having done something at Masters level and having done some research and things so you know, you could facilitate them in the right direction even if you, you know there were at time the specifics that may not be there .

Researcher: Well, as you say, there is a wide variety of things that come into that, isn't there.

Participant: Yes.

Researcher: That's great, how did you feel about having two students on placement together? (pause) Have you ever taken any undergraduate students?

Participant: Yeah.

Researcher: Have you taken one or two at a time?

Participant: Usually two.

Researcher: Usually two, so you have had quite a lot of experience of that model then?

Participant: Yeah.

Researcher: So have you enjoyed taking two together?

Participant: I do, yeah, I prefer it, for the sake that they can talk together, practice together, we are teaching two people together which is always good because, again just the flow of sort of information, communication between you know say a threesome, is always much better than one to one, although you do that individually as well, so now, I always prefer to have two.

Researcher: Ok, that's great. How would you structure a typical day with them? So what sort of things have you done with them as they've been here?

Participant: We had to structure it all fairly carefully at the beginning because we are part-time and obviously we were here different days, which again complemented, because we didn't do work, through the week there was always one of us here. So erm, we just made sure in the first week really, that neither of us had a very high patient caseload and made sure that all of their new patient assessments were seen by one of us and with you know, enough time to discuss afterwards and then the days that we were together, (named clinical tutor) and I

we tried to do things, like going through their objectives with them individually and any teaching sessions jointly, sorry I didn't really answer what a typical day was there.

Researcher: No, that's fine, so you've got some patients booked in?

Participant: Yeah.

Researcher: That they're doing?

Participant: Yeah.

Researcher: And are you observing them when they are with the patients?

Participant: Yeah, observing them with the patients and then coming out and discussing sort of in between.

Researcher: Ok, and what other strategies did you use whilst the students were on placement to develop their learning? You have given me observation, you have given me discussion of the things that they were doing. Any other strategies that you used? (pause) For example, any formal teaching sessions and things like that?

Participant: Yeah, yeah, we did, we did block out some formal teaching either with one tutor or the days with two tutors and both the students and had pencilled some topics in but we thought that, like on the first day, I sort of did some clinical reasoning with them, erm but then after we sort of listened to their objectives and we then tailored those to the type of things they wanted to practise basically and some of those were kind of more formal that we'd prepared, you know, we prepared something and we'd kind of go through it with them and others we left open and a lot of the time they then just sort of talked about the things they were unsure about and practise techniques, and we helped them to do that.

Researcher: Great, any other strategies you've used? Not saying there should be, it's just to give you the opportunity to say if there are (laughter).

Participant: I suppose the only other thing was to do a mock, you know having a mock exam day, which I think from what they said earlier was useful to them because again they didn't have any idea what it would feel like just the timing of the exam and the questions, they've got 20 minutes, so we thought that would be a really useful thing for them to go through in the third week, erm yeah.

Researcher: So thinking of all those different activities that you were doing, did the balance of ...

Participant: I have just thought of another one, well it wasn't a strategy, it was more of an experience for them, they both came to our practitioner clinics, just to observe.

Researcher: Oh, right.

Participant: So, you know and again that was useful for just seeing, you know a scope of practice, they might have come across before but just to see that, you know, so observation of just another aspect of practice.

Researcher: That's great, that's really good, so thinking of all those different strategies, did your balance or emphasis of them change as the weeks went through or did you do similar things across all four weeks?

Participant: We tried fairly similar, but the watching each patient became a bit less than at the start, so seeing follow-up patients on their own, erm and just the timing and things that sometimes happened and that probably that's the only thing (named clinical tutor) and I both talked about but we underestimated, but we then felt that we weren't

watching them enough and just the way the diaries were working out so it sort of became a bit harder to watch them so, that petered out a bit, but we kept the kind of space, we kept about the same frequencies that we were having for teaching sessions erm. Even if we didn't watch patients there was still quite a lot, there was a lot of opportunity most, every day really for them to come and talk about patients, even if we hadn't watched them, it could be anything - that sort of petered off a bit.

Researcher: Right, that's great. How would you describe your relationship with the students whilst they are on placement? What sort of relationship are you trying to establish?

Participant: Erm, I think, I think, erm quite an equal relationship in terms of, you know I don't see myself as necessarily erm, you know as if you are working with somebody who is less senior to you, you know you are the senior clinician and they are less senior than you, because they've had quite a few years and good experience and that was why it was nice to go through our backgrounds at the beginning erm and I think that was probably what I mentioned that thing about facilitating their learning with my, big thing in my head that I was doing and that and being quite approachable for them, that they didn't ever feel difficult about coming up and asking things. It is difficult isn't it to phrase the way, but yes facilitator, I suppose a bit of a mentor although not seeing yourself as necessarily miles senior than them but that they could see you as a bit of role model and how you have developed your practice, and the skills that you are trying to facilitate them learning, you know your experiences of those and how you can utilise them in practice so you know bringing a lot of examples to them of my own practice.

Researcher: That's great, that's nicely put, thank you. Thinking about the students' involvement in the placement, what do you see as their role in making it successful? So what do you expect of them?

Participant: Again to be easily approachable erm for us to feel that they communicate well and that they have no, not too many pre-judged sort of, you know, conceptions about what they, what it will be about and to be changeable as well and you know to accept that they are going to be challenged and made to think in areas that might, you know their normal clinical practice, which they wouldn't do but, and be open to that and willing to sort of change and try new things. And just be professional and you know, get into the sort of team quite quickly as well, not just to see themselves as kind of outsiders who are just there to do what they need to do, but that they can build into the team as well.

Researcher: And has that side of it worked well with these two students?

Participant: Yes, I think so, again, their sort of rapport has been quite easy from day one really. I have never found it difficult to talk to them at all. It has been nice and laid back and relaxed.

Researcher: Wonderful. Thinking about the M level side of it, what do you think it is about the placement itself that characterises it at Masters level and it might be useful to compare it to the undergraduate placement. So thinking about the placement itself and what you have done and how it has worked?

Participant: I suppose it's that they are already competent at a level that, you know when they are assessing their patients and deciding on treatments you're not really questioning their competencies at that which an undergraduate level would really need to establish if a person is going to be safe and competent. You know, that's already established and really what you are looking for is their higher level of reasoning and creative sort of practice you know, and really using a wealth of knowledge that they have learnt from the course to, again to try new things or bring things into their clinical practice that they haven't necessarily in the past, but you know really having the time to think and try new things, erm.

Researcher: So on a similar vein but this time focussing on the student and their clinical performance. When they finished all the placements what are the key characteristics of their performance, again that you think characterises them at Masters level? Some of it overlaps, you've said the reasoning there?

Participant: Yeah, you know confidence, you know, erm really excellent handling skills, that would be something I think, particularly the choice of Masters they've done and they are manual orientated even though there are the other aspects of it, but you know that they should have excellent handling skills erm and that innovative sort of thought, you know, actually using quite innovative creative techniques and not being kind of bog standard, text book techniques you know being able to think laterally and creatively.

Researcher: You said the reasoning, can you break the reasoning down a bit for me?

Participant: Erm. (pause)

Researcher: It might be useful to divide it into subjective, objective, or assessment, management, whatever would be easiest really.

Participant: Yes, subjective reasoning really is that they again, really easily picking up patient cues of what their main functional problems are that should come easily, but that they actually have the skill to explore those a bit more thoroughly as I say an undergraduate or a newly qualified physio but they, but it doesn't necessarily have to be that strict structure with their subjective interviews but that they can flow with the patient and go where the patient wants to go, but be able to get all the information they need to get. And then objectively again, really very logical planning about what they want to look at objectively without doing unnecessary tests and things again which may be at an undergraduate level students want to do too much, and at this level they should know straight on from their subjective where they need to focus and start and be able to explore those really thoroughly erm, and get you know the right evidence to help them form their hypotheses. And that should be coming from that first visit, that they should be confident enough with what they have done subjectively and objectively wise to be able to come out with a confident clinical hypothesis about that patient and to be able to really reason that back though, you know and saying what evidence they've got to help support that and not support that and really kind of clear reasons why.

Researcher: Ok, taking it wider again, anything else that you think characterises the M level of practice, again not saying there is, just giving you the opportunity to add anything.

Participant: I suppose, being, as in being really open minded and really, I think reading is quite an important simple aspect that you know that they have read widely and that they have read the relevant literature and are able to analyse that well, and you know, but then bring that back into clinical practice and questioning everything that they do, erm and questioning the evidence that is already out there and not being just accepting.

Researcher: Yeah, that's great, thinking of all those different things that you've said characterise that M levelness, is there anything that stands out as being the key issue or do you think those things are equally weighted and contributing to that?

Participant: Mmm.

Researcher: Sorry, not nice was it?

Participant: No, I think I was going to say the reasoning, I think it would be really hard to work at some of those other aspects erm sorry, that's the wrong way round. I think, I think if they can, yeah, if they can demonstrate really good reasoning some of those other aspects become a bit easier to work on. If they are able to use their knowledge, their clinical experience, questioning, you know and put it together, so even if they may not have the manual skills or they just not tried enough things that's something you can work on and erm I think...

Researcher: So the reasoning as being the pivotal aspect of that?

Participant: I think, yes.

Researcher: Thank you very much. I'll take you away from that now. Thinking about the assessment side of things, they had yesterday the assessment of two returning patients, how did you feel about that method of assessment as a way of assessing the M level practice side of things at this stage?

Participant: I think, yeah, I think it's a good way as well as obviously on the other placement they are looking at a new patient I think it is fair because there are so many variables, often with a new patient assessment that could throw, throw that for the students and that would be unfair, and I think the fact that they know their patients erm, and in part your really looking at what they've already done so far and are able to really demonstrate where they are going with them. And I think also erm, just focussing on assessment of new patients would be too limiting because often we forget that actually physios needs to know what to do afterwards and when they are going to discharge them and what their ultimate long term goal is. I think that it is a really important part of it.

Researcher: And do you think it was a fair representation of the students' performances. How they performed in the exam, was that what you'd seen on the placement?

Participant: Yes, there was some common features, I mean in fact one, you know did much better, which we sort of hoped that he could, you know we were worried that this nervousness would be his sort of failing, and he would and he kind of really pleasantly surprised us, because he really kind of got it all together on the day erm,

and showed some lovely techniques, lovely handling, a great rapport, which we knew he had and the questioning side of it just kind of came together and yes, it was really encouraging, and erm and the other one got slightly lower grades but would be again consistent throughout the, unfortunately he just probably made some just slightly less good choices of what he chose to demonstrate in terms of treatment techniques, but he still did very well, so yeah, I think they were consistent with their performances.

Researcher: Ok, that's great, that's thinking about the sort of end assessment on the placement - what about your continuous assessment of them? Did you find it easy to assess them and provide the feedback as they moved through the placement?

Participant: Yeah, I think the first week it was, I mean I found it quite hard at times to know how to kind of you know constructively criticise them in their weak areas and partly because I was thinking well it's their first few times they've been watched and they were nervous. So you didn't want to kind of you know, give them too many negative points early on. But then that's probably where I then felt I think in the second week it was a short week, Easter and everything erm I didn't manage to watch as many new patient assessments, and then by the third week probably, wondered if you know I hadn't thought out, you know I hadn't discussed enough with them some of their weakness and then by then you think, well actually it's sort of a bit unfair bringing that out now when I never brought it out before. That's may be something that I would maybe feel a bit more confident about doing next time that I would approach it earlier on, you know.

Researcher: It's a difficult balance to achieve isn't it?

Participant: Yeah, yeah.

Researcher: Because you've got to know the student well enough to judge that haven't you?

Participant: Exactly, but yeah, again in retrospect now some of those things were consistent and weren't maybe just nervousness, and the things that I, and (named clinical tutor) were picking up, we maybe could of bought out to light a bit earlier so that they could try and improve on them.

Researcher: Ok, lovely, final point for me, when the student goes away from you, at the end of the placement, what are their strengths that they will take back into their practice that they have gained from here? And then I will follow it up by asking you the areas that they still need to work on.

Participant: Right, erm individually or just jointly?

Researcher: Either, whatever is easier.

Participant: Erm, I think confidence that their they're practising at a good level, because they are both practising at a very good to excellent level, and that that was quite apparent even from earlier on and they both had excellent rapport and communication, and hopefully there is positive feedback which you don't get, you know in your normal day to day. It's really nice to be told that you communicate well and you've got good hands and you know good handling skills and I knows that helped, and whenever, if I ever got any of that consistent feedback it makes you feel really good and more confident in your own practice, so hopefully, that's something they will go away feeling as a strength, erm.

Researcher: Any areas that they need to go away and work on? Bearing in mind they have got another placement to go to?

Participant: I think, I suppose it's just the reasoning still for both of them, because it could be tightened up and that again, just comes with experience and having the time to you know, discuss patients. We did talk about it actually with one more than the other about how he was going to try and go onto just in work, how will he try and carry that through, and we talked a bit about that. You know, peer review, even if they are not in his area, just someone who can go through what you're doing and saying, so that that momentum keeps going and not just going back to their own practice again without thinking. So I think the thinking and the reading, you know just reading really widely and erm having a good background knowledge for both of them and not being too, one would sometimes a bit dogmatic about you know what he felt was right and would defend that, which was fine, but wouldn't necessarily always take the kind of alternative or think laterally enough. I hope the message got over a bit more to him that that was in a way the essence to the whole course, was to, you know so they are not questioning everything that he has ever done but try and just look at different ways of doing things, not being dogmatic really.

Researcher: Ok, that's great, that's all my set questions is there anything else that you think links into what we have discussed, that I haven't given you the opportunity to talk about?

Participant: No.

Researcher: No, ok. Thank you very much.

END OF INTERVIEW

OBSERVATION: RESEARCHER GUIDE

Explanation of presence
Informed consent from all parties
Right to withdraw at any time

Background to observation:
> ➢ Who present?
> ➢ What events are taking place?
> ➢ Aims of the observed event?

Focus for observation:

Patient - student interaction
> ➢ Activities engaged in
> ➢ Duration and frequency of activities
> ➢ Verbal communication
> ➢ Non verbal communication
> ➢ Purposes displayed by behaviour
> ➢ What appears to be the significant issues of the interaction
> ➢ Behaviour of participants to observer
> ➢ Feelings of participants
> ➢ Quotations

Examiner - student interaction
> ➢ Activities engaged in
> ➢ Duration and frequency of activities
> ➢ Verbal communication
> ➢ Non verbal communication
> ➢ Purposes displayed by behaviour
> ➢ What appears to be the significant issues of the interaction
> ➢ Behaviour of participants to observer
> ➢ Feelings of participants
> ➢ Quotations

Examiner - examiner interaction
> ➢ Activities engaged in
> ➢ Duration and frequency of activities
> ➢ Verbal communication
> ➢ Non verbal communication
> ➢ Purposes displayed by behaviour
> ➢ What appears to be the significant issues of the interaction
> ➢ Behaviour of participants to observer
> ➢ Feelings of participants
> ➢ Quotations
> ➢ Mark and feedback

Issues meriting further consideration

Reflective summary

PO3 (first returning patient)

Event: **Student examination (returning patient)**

Student – patient interaction (10.30am)
Present: Student / patient / 2 examiners / observer
Purpose: Evaluation and decision-making regarding treatment today and future planning, with constant re-evaluation.

Student explained purpose of session, and questioned briefly on the subjective findings, with an emphasis on verbal communication. Objective differences were explored and compared to last visit 'any problems there?' 'just arch yourself backwards to me'. Student explained any differences since last visit.
Clear instructions regarding testing and evaluation of change. Explanation of testing to inform patient. Treatment integrated with assessment e.g. hip technique and immediate evaluation of change using 4 objective tests. 'How does that feel?' 'That is easier'. Constant discussion of issues / progress / decisions regarding what to do. Examiners positioned to observe from different aspects.
Care with positioning patient in preparation for testing / treatment. Checking of positioning for precision of technique, with correction as required 'keep your pelvis still'. Treatment. Reassessment to evaluate any change.
Participants appeared unaware of observer. All participants appeared at ease. Explanation of aims of treatment. Went through exercises from home. Correction of exercises to ensure accuracy, and use of mirror to illustrate exercises to patient. Same exercises in two different positions, with emphasis on muscle activity. Student demonstrated as patient was unclear. Moved to change exercise as 'I need to give you another exercise as that one is quite difficult at present', highlighting constant evaluation and analysis.
Adaptability depending upon observations, was trying 1 leg exercise and had to change to 2 as too difficult. Wrote down exercises for patient.

Examiner – examiner interaction 1 (11.08am)
Present: 2 examiners / observer
Purpose: Discussion of student performance, and identification of areas for discussion.

Unclear regarding lumbar spine component from initial assessment. Highlighted issue of justifying focus of treatment, acute or chronic. Explored order of questions and who asking what. Other aspects of management? Prognosis? Identified need for specific questions re what thinking to justify what doing. It was unclear to the examiners what the student was doing and thinking – and so needs explanation and linking to changes observed during treatment. Examiners identified that patient has not moved on since initial treatment, raising the issue of whether the student has diagnosed what is left. Was there a different presentation today? – appeared to be, yet student has not changed from their plan. Identified patient as a complicated patient, but recognised that this should give the student opportunity. Some concern over performance discussed regarding reasoning through and assessing lumbar component to patient's problem. From patient notes – some gaps, in particular, student not reassessing fully.

Examiner – student interaction 1 (11.20am)
Present: Student / 2 examiners / observer
Purpose: Discussion of patient's presentation and student's reasoning.

'What was your clinical diagnosis?' as initial question to encourage student. Student summarised initial presentation and initial exploration of the different contributions to the patient's problems by the different possible structures. 'So what do you think was causing the symptoms down the leg?' as a probing question to explore specific points. Questioning to encourage student to explain thinking. 'What is it that she is left with?' 'How does that all fit in with the pain that she has now?' to encourage student to be specific regarding structural diagnosis. Observer positioned outside of the discussion group so no obvious effect on interaction. Student asked to justify components of treatment / plan of treatment progression. Focus on verbal communication.
Some aspects of a discussion, but emphasis on questions and answers.
Asked student to self-analyse re their success with the patient.
Student made links to evidence regarding the non specificity of exercises for low back pain. Explored prognosis and objective aims and timescale.

Examiner – examiner interaction 2 (11.38am)
Present: 2 examiners / observer
Purpose: Discussion of student performance, and decision regarding a mark.

Discussion reflected treatment and highlighted that students was not progressing patient effectively. Slow to progress but overall OK and recognising other issues. Some debate amongst examiners re these points. Examiners felt that lack of rapport at times reflected the student's nerves.
Perspective of one examiner being familiar with patient informed the discussion, and also informed regarding the normal performance of the student.
Recognised student's ability to self-evaluate.
Reassessment and planning was felt to be effective and the student did clear the last hip component.
Some decisions in the discussion were justified and analysed. An effective performance with some links to the literature.
Awarded a mark of 59% (C).
Control of process by external examiner to guide the process. Discussion re mark was not reflective of performance on placement. Examiners justified their different perspectives and explored the issues to agree the mark.

Examiner – student interaction 2
Present: Student / 2 examiners / observer
Purpose: Feedback of comments regarding student performance and mark.

Process encouraged self-analysis.
Feedback reflected above observations

Issues meriting further consideration
Use of the assessment feedback sheets?

Reflective summary
Reaching saturation of data with same issues emerging.

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24th October 2002

Mrs A Rushton
School of Health Sciences – Physiotherapy
Morris House
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Birmingham, B15 2TT

Dear Mrs Rushton,

Ethics application: The M levelness of clinical practice for healthcare professionals

Thank you for submitting your proposal for the above study. Following review of this project no problems were identified, and approval to proceed is granted by the Ethics Committee of the School of Health Sciences.

Yours sincerely,

Dr S Kelly.
Chair of Ethics Committee, School of Health Sciences

Appendix 8.16: Report on Delphi data round 1 by independent researcher

Four different types of course were covered – physiotherapy, nursing, radiography and interdisciplinary. The numbers of responses varied from nursing (n=3), interdisciplinary (n=4), physiotherapy (n=10) and radiography (n=21). Unfortunately, one set of responses in the nursing sub-set does not relate to responses either from the other nurses or the other professionals. The nursing information is therefore thin and it is difficult to assess how representative these data are of the wider population.

The terminology used to describe similar areas varied with the individual professions. For example, the physiotherapists used the term 'clinical reasoning' whilst decision-making was occasionally used by radiographers – *such semantic differences are probably a reflection of the different practices involved in specific management of patients. Therefore, where terms were equitable they should be grouped.*

Summary of key themes

Across all surveyed areas, certain issues emerged as crucial and common. These included:

- Clinical reasoning (including references to reflection, decision making and problem solving)
- Utilisation of evidence based practice.
- Change in skill level. In physiotherapy for example, reference was made to some aspects of skills required to examine and treat patients. The radiographers referred to issues of competence including report writing, application of tests, ability to interpret images.
- Communication with the patients, carers and professional colleagues was seen as crucial.
- Evaluation of practice.
- Some references were made to the application of theory to practice.

Other points

The radiographers tended to mention autonomous, independent practice.

A small number of references to:

Leadership, management and training, Policy issues (mainly interdisciplinary group), Record keeping, Creativity, originality, Acting as a role model

Generally, there appears to be a high level of agreement between the disciplinary groups regarding the more generic qualities (cited above). Naturally differences are identifiable at a lower level reflecting differences in scope and content of clinical practice. Even so, it is obvious that the respondents see as important some change in skill level associated with study at M level what ever those skills comprise. It would therefore be justifiable to analyse these data generally and not feel impelled to analyse by professional group. However, it needs careful definition of what is / is not included in each group. For example, do you include knowledge with clinical reasoning? After all, it is a vital component of CR - increases in knowledge therefore supports better CR.

Gill James   5/3/03

Non parametric Kendall's W test for all participants

Ranks

	Mean rank
Behaviour 1	17.32
Behaviour 2	7.64
Behaviour 3	19.56
Behaviour 4	18.15
Behaviour 5	19.44
Behaviour 6	18.42
Behaviour 7	13.75
Behaviour 8	18.00
Behaviour 9	15.86
Behaviour 10	12.96
Behaviour 11	14.25
Behaviour 12	16.89
Behaviour 13	15.58
Behaviour 14	4.26
Behaviour 15	12.11
Behaviour 16	10.76
Behaviour 17	15.46
Behaviour 18	17.08
Behaviour 19	8.46
Behaviour 20	16.25
Behaviour 21	18.11
Behaviour 22	9.74
Behaviour 23	13.46
Behaviour 24	12.82
Behaviour 25	15.13
Behaviour 26	15.21
Behaviour 27	16.75
Behaviour 28	12.58

Test statistics

N	36
Kendall's W[a]	.289
Chi-square	280.688
df	27
Asymp.Sig	.000

[a] Kendall's Coefficient of Concordance

Non parametric Kendall's W test for physiotherapy group

Ranks

	Mean rank
Behaviour 1	16.80
Behaviour 2	5.70
Behaviour 3	17.85
Behaviour 4	18.45
Behaviour 5	19.25
Behaviour 6	17.40
Behaviour 7	13.95
Behaviour 8	17.90
Behaviour 9	18.20
Behaviour 10	9.95
Behaviour 11	16.70
Behaviour 12	17.00
Behaviour 13	14.30
Behaviour 14	3.40
Behaviour 15	17.15
Behaviour 16	8.85
Behaviour 17	16.20
Behaviour 18	18.90
Behaviour 19	8.55
Behaviour 20	17.05
Behaviour 21	17.85
Behaviour 22	10.55
Behaviour 23	13.75
Behaviour 24	14.55
Behaviour 25	13.00
Behaviour 26	16.85
Behaviour 27	18.90
Behaviour 28	7.00

Test statistics

N	10
Kendall's W[a]	.454
Chi-square	122.461
df	27
Asymp.Sig	.000

[a.] Kendall's Coefficient of Concordance

Non parametric Kendall's W test for radiography group

Ranks

	Mean rank
Behaviour 1	16.38
Behaviour 2	7.97
Behaviour 3	20.30
Behaviour 4	19.65
Behaviour 5	19.98
Behaviour 6	18.48
Behaviour 7	12.43
Behaviour 8	18.65
Behaviour 9	14.88
Behaviour 10	14.18
Behaviour 11	13.23
Behaviour 12	17.65
Behaviour 13	16.10
Behaviour 14	4.53
Behaviour 15	10.52
Behaviour 16	12.18
Behaviour 17	14.93
Behaviour 18	15.45
Behaviour 19	7.80
Behaviour 20	15.85
Behaviour 21	17.27
Behaviour 22	8.98
Behaviour 23	13.73
Behaviour 24	12.98
Behaviour 25	17.25
Behaviour 26	14.80
Behaviour 27	15.48
Behaviour 28	14.43

Test statistics

N	20
Kendall's W[a]	.294
Chi-square	158.749
df	27
Asymp.Sig	.000

[a] Kendall's Coefficient of Concordance

Non parametric correlations

Correlations

Appendix 8.17			Physiotherapy group	Radiography group
Spearman's rho	Physiotherapy	Correl coeff	1.000	.735**
		Sig (2-tailed)		.000
		N	28	28
	Radiography	Correl coeff	.735**	1.000
		Sig (2-tailed)	.000	
		N	28	28

** Correlation is significant at the .01 level (2-tailed)

Appendix 8.18: Report on Delphi data round 2 by independent researcher

- Quantitative data

On examining the statistics it seems the variables which might create the most difficulties were numbers 2 (management skills – mean 3.51, median 3), 14 (formal teaching – mean 2.95, median 3), and 19 (multi-professional involvement – mean 3.62, median 3). On examining the frequency tables, variable 2 shows responses of 2 from 11% of subjects and responses of 3 from a further 39%. Variable 14 shows 3 responses of 1 – implying no importance to involvement in formal teaching and for variable 19, 50% of respondents have specified a 2 or a 3 to this attribute.

On examining the attributes, which have scored means in the region of 3.8 – 4.2 and medians of 4, variables 15 (advanced diagnosis / problem list formation) and 16 (clinical research / evidence) raise concerns. Variable 15 has a low mean (4.00) although the median remains at 4. However, responses are evenly spread across 3 – 5 suggesting a lack of consensus. Variable 16 has a lower mean (3.84) although the median remains at 4 but the frequency data shows responses ranging from 2 – 5, with the bare majority of the responses being a 4 (54%). Variable 10 (mean 4.1) however, shows frequency responses of 80% for 4 and 5 suggesting there is more consensus regarding this attribute.

Variable 22 shows a wide range of responses with the majority responding 4 (47%). Variable 23 (communicating conclusions) has less breadth of response with the majority scoring 4 or 5 (73%) thus showing more consensus. Variable 24 (creativity) has 88% showing 4 or 5 and variable 25 (professionalism) has 86% showing in this range. Adaptability (variable 26) shows over 90% responses in 4 or 5 and awareness of complex issues (variable 28) has 81% in this range.

- Qualitative data

On examining the open responses given by subjects, it is apparent that there are some areas that the subjects consider to be ambiguous. These areas are not necessarily the same as those identified by the statistical analysis. The attributes relating to management skills and involvement in formal teaching appears to be ambiguous since it is unclear whether it applies to patients / colleagues / workplaces. The attribute of advanced professionalism is an evident area of concern for some respondents. Indeed, generally the use of descriptors such as high level or advanced seems to create uncertainties and ambiguities – could you consider omitting these on the grounds that professionalism (for example) is not necessarily a continuum?

Gill James
June 5th 2003

Non parametric Kendall's W test for all participants

Ranks

	Mean rank
Behaviour 1	11.10
Behaviour 2	6.82
Behaviour 3	7.12
Behaviour 4	5.74
Behaviour 5	7.54
Behaviour 6	11.28
Behaviour 7	12.74
Behaviour 8	10.07
Behaviour 9	13.59
Behaviour 10	10.76
Behaviour 11	8.09
Behaviour 12	10.97
Behaviour 13	9.35
Behaviour 14	11.68
Behaviour 15	13.88
Behaviour 16	13.82
Behaviour 17	13.06
Behaviour 18	13.68
Behaviour 19	11.88
Behaviour 20	11.24
Behaviour 21	16.59

Test statistics

N	34
Kendall's W^a	.200
Chi-square	136.263
df	20
Asymp.Sig	.000

[a] Kendall's Coefficient of Concordance

Non parametric Kendall's W test for physiotherapy group

Ranks

	Mean rank
Behaviour 1	6.55
Behaviour 2	7.40
Behaviour 3	9.10
Behaviour 4	5.60
Behaviour 5	6.30
Behaviour 6	7.30
Behaviour 7	15.20
Behaviour 8	9.15
Behaviour 9	13.30
Behaviour 10	14.40
Behaviour 11	10.10
Behaviour 12	12.30
Behaviour 13	10.80
Behaviour 14	10.20
Behaviour 15	13.70
Behaviour 16	12.60
Behaviour 17	13.90
Behaviour 18	11.80
Behaviour 19	13.70
Behaviour 20	8.90
Behaviour 21	18.70

Test statistics

N	10
Kendall's W[a]	.302
Chi-square	60.340
df	20
Asymp.Sig	.000

[a] Kendall's Coefficient of Concordance

Non parametric Kendall's W test for radiography group

Ranks

	Mean rank
Behaviour 1	13.33
Behaviour 2	6.67
Behaviour 3	5.06
Behaviour 4	6.33
Behaviour 5	9.31
Behaviour 6	13.75
Behaviour 7	10.22
Behaviour 8	10.56
Behaviour 9	12.72
Behaviour 10	8.89
Behaviour 11	6.50
Behaviour 12	9.78
Behaviour 13	10.17
Behaviour 14	13.44
Behaviour 15	14.67
Behaviour 16	14.56
Behaviour 17	11.22
Behaviour 18	14.44
Behaviour 19	10.56
Behaviour 20	13.22
Behaviour 21	15.61

Test statistics

N	18
Kendall's W[a]	.250
Chi-square	90.157
df	20
Asymp.Sig	.000

[a] Kendall's Coefficient of Concordance

Non parametric correlations

Correlations

			Physiotherapy group	Radiography group
Spearman's rho	Physiotherapy	Correl coeff	1.000	.283
		Sig (2-tailed)		.214
		N	21	21
	Radiograph	Correl coeff	.283	1.000
		Sig (2-tailed)	.214	
		N	21	21

** Correlation is significant at the .01 level (2-tailed)