

The impact of a musculoskeletal masters course: Developing clinical expertise

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a b s t r a c t

A common aim of Masters (MSc) courses in the UK, accredited by the Manipulation Association of Chartered Physiotherapists (MACP), is to promote the clinical expertise of practitioners. Few studies have explored the extent to which this is achieved and understanding is further hampered by the contested nature of expertise. This paper reports on the impact of an MACP approved MSc on practitioners and offers a conceptual model of their development towards clinical expertise.

A qualitative theory-seeking case study was used, drawing on the procedures and processes of grounded theory. Twenty-six semi-structured interviews were conducted with eleven alumni from one MACP approved MSc programme. Dimensional analysis and the constant comparative method of data analysis, was used to build the conceptual model.

Prior to enrolment, practitioners uncritically accepted knowledge from others and followed habitual routines with their patients. Their diet of informal CPD appeared ineffective in developing these attributes. The impact of the MACP approved MSc involved three developmental aspects of clinical expertise: critical understanding of practice knowledge, patient centred practice and capability to learn in, and from, clinical practice. These inter-related aspects of knowledge, practice and learning offer a conceptual model of the development towards clinical expertise. The most powerful experience to trigger change was direct observation and feedback of their clinical practice by an MACP educator; this highlights the value of clinical mentors facilitating less experienced colleagues. The implementation of such mentorship within departments may offer a cost effective and manageable way to support CPD within the workforce.

1. Introduction

In 1992, the first clinically orientated masters (MSc) course was set up and accredited by the Manipulation Association of Chartered Physiotherapists (MACP). There are now eleven MACP approved MSc courses in the United Kingdom (UK), all of which satisfy international academic standards for musculoskeletal physiotherapy education (International Federation of Orthopaedic Manipulative Physical Therapists [IFOMPT], 2008) and undergo regular national and international quality monitoring (Rushton and Petty, 2002). A major aim of both the MACP and IFOMPT is to promote excellence in clinical standards of musculoskeletal physiotherapists and this is reflected in the course requirement of 200 h of neuromusculoskeletal physiotherapy theory, 150 h of practical skill development and 150 h of mentored clinical practice (International Federation of Orthopaedic Manipulative Physical Therapists [IFOMPT], 2008).

The importance of the clinical placements to develop clinical expertise has been highlighted by Rushton and Lindsay (2007) and is consistent with the literature related to situated learning (Fish and Coles, 1998; Billett, 2001, 2004; Dall'Alba and Sandberg, 2006) and mentorship (Daloz, 1999; Jensen et al., 1999). New knowledge and skills need to be learnt within the setting to which it is to be applied. Learning facilitated by an experienced mentor giving guidance, challenge and support to a less experienced practitioner can help to consolidate applied theory and expose new opportunities for learning. This helps explain why mentored clinical practice is considered so important to students. MACP approved courses provide a significant step towards advanced clinical practice and specialisation (Carr and Shepherd, 1996; Chartered Society of Physiotherapy, 2002a, 2002b; Robertson et al., 2003) with enhanced career development (Stathopoulos and Harrison, 2003; Conneeley, 2005; Green et al., 2007) that includes advanced practitioner and consultant roles within the UK NHS (Department of Health, 2008). A variety of publications document the expected learning outcomes following Masters level study in the UK (Chartered Society of Physiotherapy, 1998;

International Federation of Orthopaedic Manipulative Physical Therapists [IFOMPT], 2008, Quality Assurance Agency Qualifications Framework, 2008; The European Qualifications Framework for Lifelong Learning, 2008). While Masters level study is likely to affect the practitioner, the workplace, patients and the profession (Gosling, 1999), the focus of this paper is the impact on the practitioner and their clinical practice.

Only three studies have explored the impact of an MACP approved MSc on practitioners (Stathopoulos and Harrison, 2003; Green et al., 2007; Rushton and Lindsay, 2010); the findings are summarised in Table 1. Stathopoulos and Harrison (2003) carried out a phenomenological study using focus group interviews with five practitioners, three of whom had completed an MACP approved MSc. Practitioners became more confident, more patient centred and developed enhanced clinical reasoning. They gained a greater depth of knowledge and were able to critically synthesise the evidence to inform their practice. They also developed a greater awareness of how to learn. Similar findings were found by Green et al. (2007) who used a postal questionnaire to investigate the career development of 48 practitioners from one MACP approved MSc. Similarly, a North American study using a postal questionnaire of 90 alumni from an American Orthopaedic residency programme, approved by the American Academy of Orthopaedic Manual Physical Therapy (member organisation of IFOMPT), also found practitioners gained enhanced clinical reasoning and a better ability to critically evaluate and apply evidence-based practice (Smith et al., 1999).

More recently, a theoretical construct of Masters level clinical practice has been conceptualised by triangulating the findings from a Delphi study (Rushton and Lindsay, 2008) and an exploratory case study (Rushton and Lindsay, 2010) with involvement of university tutors, students and clinical tutors. Masters level clinical practice was described as a combination of three overlapping entities: high level clinical reasoning, advanced use of knowledge and high level of personal characteristics (e.g. criticality, creativity and reflective practice), operating within the context of evidence-based and patient centred practice (Rushton and Lindsay, 2010). While this more comprehensive description of master level clinical practice builds on previous research findings (Stathopoulos and Harrison, 2003; Green et al., 2007) and offers a sound framework to inform curriculum development, it raises further questions. The inter-relationship between clinical reasoning, knowledge and personal characteristics, as well as between patient centred practice and evidence-based practice remains unclear. Understanding the dynamic relationship between these characteristics may help

Table 1
Impact of an MACP approved MSc on practitioners.

Stathopoulos and Harrison (2003)	Green et al. (2007)	Rushton and Lindsay (2010)
More confident practitioners	More confident practitioners	More confident practitioners
Greater depth of knowledge	Greater depth of knowledge	Advanced use of knowledge
Improved clinical reasoning	Improved clinical reasoning	Improved clinical reasoning
Enhanced criticality and analysis	Enhanced ability to evaluate research	Enhanced criticality of practice, research and self
More able to engage in evidence-based practice	More able to engage in evidence-based practice	Greater justification of clinical decisions using evidence from the literature
More patient centred Greater awareness how to learn		More patient centred

inform curriculum design and delivery for educational programmes that seek to promote clinical expertise. This paper explores the impact of an MACP approved MSc on practitioners and offers a conceptual model of their development towards clinical expertise.

2. Methodology

2.1. Design

A naturalistic enquiry (Guba and Lincoln, 1981; Erlandson et al., 1993) using a single theory-seeking case study design (Bassey, 1999; Simons, 2009) was used and closely resembled the procedures and processes of grounded theory (Morse et al., 2009). This paper reports on practitioners' perceived learning outcomes following successful completion of an MACP approved MSc. These learning outcomes form part of a broader theory on the learning transition of practitioners reported elsewhere (Petty et al., 2010).

2.2. Participants

Thirty five alumni who had successfully completed the MSc Neuromusculoskeletal Physiotherapy from one UK university were identified from the open access pages of the MACP website (<http://macpweb.org>). Purposive sampling was used to select alumni from a wide range of experiences and from different cohorts, graduation years, work settings and gender. Biographical data is given in Table 2. Eleven alumni agreed to take part and gave informed consent. Ethical approval was obtained from the research and ethical committee of the local university.

2.3. Methods

A total of 26 audio-recorded, telephone or face to face semi-structured interviews (amounting to 19 h) were conducted between January 2005 and April 2007. All but one participant was interviewed two or three times. The interview agenda for the first, second and third round of interviews is shown in Table 3.

The insider status of the researcher gave credibility to the study and facilitated a comfortable and trusting relationship with the researcher. Participants believed they could be honest as the subsequent power relationship with the researcher was no longer in existence. In the first interview, the last question aimed to diminish potential bias, by exploring it openly with participants'. The researcher (NJP) had been course leader and module leader of MACP specific modules when study participants had undertaken the MSc, and remained in these roles during the study. The MACP specific modules were two university-based modules covering neuromusculoskeletal theory and practical skill development and two clinical placements involving mentored clinical practice.

Table 2
Profile of participants (N = 11).

Mean age	38.2 (range 31e52)
Mean years in clinical practice	8.5 (range 3e24)
Practice setting	4 in private practice 7 in NHS: 1 at band 7 (Advanced Practitioner) 4 at band 8A (Extended Scope Practitioner) 2 at 8B (Consultant Practitioner)
Mean years since completed MACP approved MSc	2.4 (range 2 months e5 years)

Table 3
First, second and third interview agendas.

<p>Round 1 interview agenda</p> <p>In what ways, if any, has your clinical practice been affected by the course?</p> <p>In what ways, if any, has the course affected your career/professional development?</p> <p>Has the course had an impact on you personally in any way?</p> <p>Have there been any negative effects of completing the course?</p> <p>Is there anything else?</p> <p>At the completion of the interview, participants were asked to comment on the interview process and participant bias. The following themes captured their responses:</p> <p>Credibility of the researcher: it was a natural extension as course leader</p> <p>Credibility of the research: necessary study to inform the course programme</p> <p>Comfortable: felt at ease discussing their learning experience with someone they knew</p> <p>Trust: confidence in the researcher's interpretation of their comments</p> <p>Honesty: previous power relationship with researcher had been disbanded a few years ago and enabled them to be 'honest'</p> <p>Round 2 interview agenda</p> <p>Pre-course experience</p> <p>Expectations of the course experience of the course</p> <p>Impact of the course</p> <p>Post course activities and development</p> <p>Is there something else we should discuss?</p> <p>Round 3 interview agenda</p> <p>Influence of previous learning on perceived self efficacy to succeed</p> <p>Perceived self efficacy and identity</p> <p>Influences on perceived self efficacy</p> <p>Current learning needs and perceived self efficacy</p>
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The knowledge gleaned over 10 years was considered data in the form of observational memory and helped inform data analysis.

2.4. Data analysis

Dimensional analysis (DA) draws upon the 'core practices' of grounded theory (GT) (Schatzman, 1991: 303), but has its own specific procedures and philosophical history that distinguishes it from GT. DA provides the researcher with interpretive procedures to help order their analysis. These include: reading transcripts, labelling data (properties), recasting these labels with more abstracted terms that clarify meaning (dimensions), and building patterns between these abstracted terms to explain a social process (Kools et al., 1996). This enables the analyst to see the data from a different theoretical perspective, re-reading the original transcript to label data to challenge, confirm or create new explanation. This cyclical process is then supported by comparison across other cases to identify difference and commonality that can shift the perspective or theoretical view of the data. Thus dimensions are built inductively but their veracity are checked by deductive measures to confirm or refute their significance. The data are then challenged to see if this perspective provides a central organising phenomenon around which other dimensions orbit. This is written as an explanatory matrix that tells a story of the context, conditions, actions/processes and the consequences of the social interaction under review (Schatzman, 1991: 308). Each phase is driven by analytical questions that help to interrogate the data and theoretical memos that provide an audit trail of the decisions made during the analytical procedure.

Analysis of the first round of interviews identified a number of learning outcomes and students' experiences from the course, but failed to identify the learning process involved. Role and learning transition theory (Allen and van de Vliert, 1984; Scholes, 2006) and social learning theory (Bandura, 1977, 1997) provided a theoretical framework to examine the learning process involved to achieve

these outcomes. This provided greater theoretical sensitivity to guide round two and three interview agendas and subsequent analysis.

2.5. Trustworthiness

The researcher and participants had a shared knowledge of the MSc course programme and this could be construed as insider research (Robson, 2002). However the focus of this study was an exploration of the participant's experience of their learning journey, to which the researcher was unaware and was thus an outsider (Mercer, 2007). Nevertheless, the close involvement of the researcher required strategies to minimise bias that would otherwise threaten the trustworthiness of the study (Mercer, 2007). The researcher reduced bias by taking a reflexive and critically reflective stance throughout data collection and analysis. Transcribing each interview, for example, enabled critical reflection on the interview process and the researcher's influence on the data with subsequent interviews enabling understanding to be checked. The three years of data collection and analysis allowed development of a strong researcher identity and researcher-participant relationship with disentanglement from the roles of course and module leader. The initial interview provided an opportunity to debrief and explore the impact of the course on their practice. In subsequent interviews, most of which were by telephone, participants' revealed more personal and difficult experiences of the course. The iterative process of data collection and analysis enabled frequent verification checks to be made with participants. Formal and informal critical evaluation of the findings by current students and colleagues was also obtained. Rigorous testing out of ideas throughout data analysis was considered essential to the trustworthiness of the study.

3. Findings

Practitioners (referred to as P1, P2 etc) described the impact of the MSc by comparing it to their practice prior to enrolment; for this reason the findings are presented in a similar way. The term 'practice knowledge' is used to include all types of knowledge (propositional, practical, tacit etc) used in clinical practice including cognition, metacognition, reflection and clinical reasoning (Eraut, 1994; Higgs et al., 2004).

3.1. Prior to enrolment on the MSc

Participants tended to uncritically accept knowledge from research articles, 'I read a paper and if it's good, it might make me think I must do that in my practice'(P1) and from those teaching weekend courses where they were 'given recipes and approaches'(P3). Participants understanding of practice knowledge was limited and this adversely affected their clinical practice, 'I wasn't quite sure when or why I should treat. I had a whole range of techniques I could use but I wasn't sure when to apply them' (P3); 'I sort of threw a technique at the problem'(P11).

Clinical practice was characterised with habitual routines with patients, 'I was just going through a process because that was the process I'd been taught to do' (P4), using 'recipe treatments and pathology based treatments'(P3). Participants tended to apply techniques to patients with little critical evaluation of effectiveness, 'It might be quite a few treatments down the line before you're really thinking 'am I actually helping the problem?' (P2) Their professional development activities involved in-service training and weekend courses, but this was 'not really helping me pull it all together'(P2); and this triggered a number of participants to enrol onto the MSc. Participants appeared dependent on others for knowledge with little disposition to critically evaluate knowledge.

They demonstrated an over reliance on propositional knowledge with little use of experiential or tacit knowledge and metacognition and appeared to have a technical rationale view of clinical practice (Fish and Coles, 1998).

3.2. Successful completion of the MSc

Participants enhanced their practice in terms of three inter-related aspects: they gained a critical understanding of practice knowledge that facilitated more patient centred practice, which led to a capability to learn in and from practice. These three aspects of clinical expertise are depicted in Fig. 1. While the large arrowhead indicates the overall direction of development, the small arrowheads highlight that patient centred practice enhanced understanding, and learning from practice enhanced patient centred practice. The most powerful learning process of the MSc was on clinical placement with an MACP approved clinical educator; this involved direct observation of their clinical practice with patients with subsequent questioning, discussion and critical feedback. In addition, participants observed the educator with patients who sometimes became 'a really good role model' (P10).

3.2.1. Critical understanding of practice knowledge

Participants gained a deeper understanding of practice knowledge, 'I (came) to look at everything I did in a much deeper way' (P1). They understood why they were asking the questions in the subjective examination and why they were performing the tests in the physical examination, 'You know exactly why you've done each test and for what reason' (P2). Participants demonstrated more overt metacognition in their practice, became less dogmatic and more open to alternative ways to practice, 'helped me understand there are two or three ways to do something, before I used to think there was only one way to do something' (P10). This suggests participants' thinking moved from dualism towards relativism (Perry, 1970).

Enhanced understanding impacted on their treatment and management of patients. They became more deliberate and creative with a greater ability to justify their decisions, 'I can move

logically, but still quite creatively, and can justify what I am actually doing' (P7); 'Once you understand the anatomy, biomechanics, and pathologies, you can then treat anything in any situation' (P1). Practice thus became contingent and was viewed as professional artistry (Fish and Coles, 1998).

Participants gained enhanced criticality towards research, 'able to review new literature in a much better way' (P4), 'I don't just read the journal and think everything's absolutely right, I question everything' (P9) and toward their own clinical practice and that of others, they became 'more confident to challenge myself and other people on diagnosis or progression' (P3). They had become more critically evaluative of research and used research evidence more judiciously so that 'decisions around assessment and treatment are more accurate and informed, based around the evidence' (P10). Participants demonstrated a shift from uncritical acceptance to critical evaluation and application of propositional knowledge.

For most participants their enhanced understanding of their practice enabled them to communicate more effectively with patients, 'You have to have the evidence to know why you are doing that and then you've got to then sell that to the patient.. the more you feel you're confident about something, then the better you're going to impart that knowledge' (P4). They thus gained enhanced self efficacy in their practice knowledge (Bandura, 1997).

Deep conceptual understanding with integration of all types of knowledge and an ability to critically evaluate knowledge is considered characteristic of expertise (Sandberg, 2000; Benner, 2004; Higgs and Jones, 2008) and enabled them to become more patient centred.

3.3. Patient centred practice

Patient centred practice is used here to refer to the conscious, deliberate, creative and individualised clinical care of patients (Eraut, 1994; Martin et al., 1999; Higgs and Titchen, 2000). Participants' practice became more deliberate and individualised, 'I used to think all shoulders are the same and all hips are the same. I then saw each patient more as an individual' (P1).

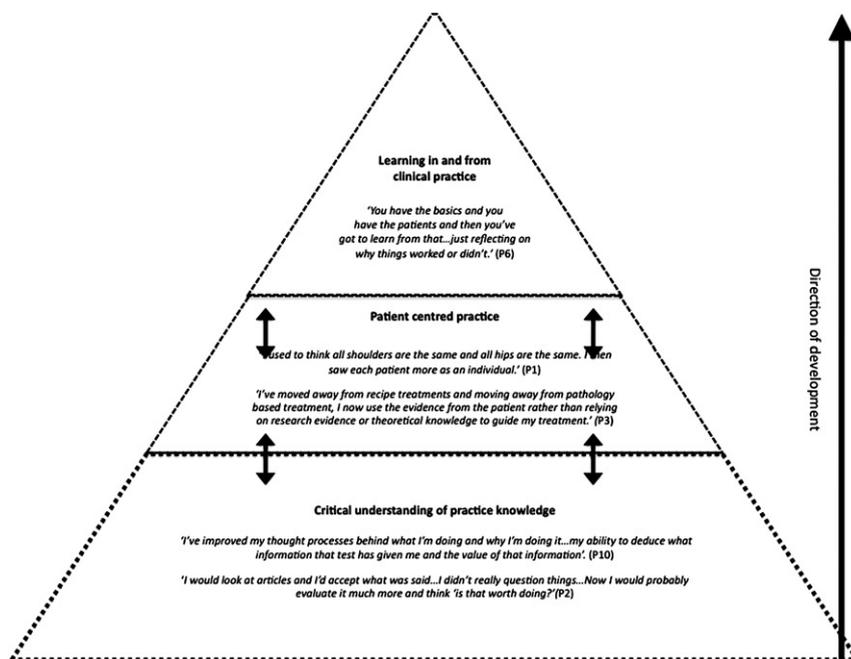


Fig. 1. The direction of development towards clinical expertise involved three developmental aspects: critical understanding of practice knowledge led to patient centred practice, which in turn led to a capability to learn in, and from, clinical practice. The smaller arrowheads indicate that learning in and from practice enhanced patient centred practice, which in turn enhanced critical understanding of practice knowledge.

While a more creative, deliberate and individualised approach would enhance collaboration with the patient, the degree to which this was achieved remained unclear. There were limitations in their assessment of patients, *'fear, attitudes and beliefs about the pain are a huge component and I don't know that the course helped me much with that'* (P2); *'It (The course) didn't address the yellow flags and centrally sensitised people and affective disordered people. it was all about mechanical pain'*(P10). The main focus of the course was developing practitioner's diagnostic reasoning for patients with physical impairments and this was borne out in the data.

Assessment findings were now used to guide treatment choice and *'gave me the freedom to create treatment techniques to suit me and the patient'*(P6). Greater depth of understanding and knowledge of the principles underpinning practice enabled them to better manage patients with more complex and recurrent presentations. While understanding enabled the practitioner to adapt and be creative in their practice to meet the needs of the individual, criticality led to continual assessment, analysis and evaluation of patient management to ensure practice was effective for the patient. Offering this more flexible approach to meet the needs of individual patients enhanced their ability to learn in, and from, practice.

3.4. Learning in and from practice

Participants questioned and evaluated their practice, no longer assuming they were effective and this then enabled them to learn in, and from, their practice, *'Each patient is like an individual piece of research, each one adds to your knowledge and experience'* (P5); *'(the course) teaches you how to learn. You have the basics and you have the patients and then you've got to learn from that.why did that work, why did this not work?'*(P6) Over time, this process enhanced their prognostic judgement, *'I know who I can and can't help'*(P7).

The majority of participants commented on a greater ability to learn on their own and this reduced their attendance at weekend courses. Almost all talked about their continued thirst to learn after the MSc and drive to improve their practice, *'I can always do better and improve myself as a clinician'*(P10). Participants became more autonomous learners *'I do far less weekend courses because I don't think there are any courses out there that can teach me anything more than I can learn on my own'*(P1). Their reduced attendance at weekend courses suggests their practice became *the* learning environment for them. This may indicate that their practice knowledge was fashioned in such a way that it was coherent and consistent with their clinical practice. They were able to not only operate in the messy and unpredictable world of clinical practice, but were able to learn from it. This capability to learn in, and from, practice is considered essential not only to develop but also to maintain clinical expertise (Eraut, 1994; Fish and Coles, 1998; Daley, 1999; Martin et al., 1999; Benner, 2004).

4. Discussion of findings

The attributes of clinical expertise identified in this study are conceptualised within three developmental strands: critical understanding of practice knowledge, patient centred practice and a capability to learn in, and from practice. These inter-related aspects of knowledge, practice and learning offer a new conceptual model to explain the development of autonomous and critically reflective practitioners. While previous studies have demonstrated individual attributes of clinical expertise (Stathopoulos and Harrison, 2003; Green et al., 2007; Rushton and Lindsay, 2010), this study proposes a dynamic process that enabled practitioners to develop expertise.

Prior to enrolment, practitioners uncritically accepted knowledge from others and were dependent on others to learn; this has

been reported elsewhere (Richardson, 1999; Smith et al., 1999; Stathopoulos and Harrison, 2003; Conneeley, 2005; Green et al., 2007). They followed routines in their practice, and were not able to adapt to individual patients. Their diet of informal CPD (weekend courses and in-service training) appeared ineffective in changing these attributes.

Pivotal to learning during the MSc was direct observation and feedback of their clinical practice by an MACP educator. Questioning by the educator enabled the practitioner to become aware of their assimilated hidden, taken for granted knowledge (Titchen, 2001). It is proposed that through critical enquiry this knowledge became less personally embedded (Kegan, 2000), more discriminating, integrated, differentiated, open (Mezirow, 1991), dependable and justified (Cranton, 2000) leading to more complex and comprehensive embodied understanding (Dall'Alba, 2004; Dall'Alba and Sandberg, 2006). This learning process enhanced their understanding of, and criticality towards, practice knowledge, which is considered essential for patient centred practice (Fish, 1998; Fish and Coles, 1998; Johns, 1998). While practitioner's developed a more creative, deliberate and individualised patient centred approach, their attention to psychosocial issues appeared limited; this reflected the course curriculum at the time. The emphasis was on diagnostic reasoning and further study post MSc into the complexity of psychosocial issues would be needed. The acknowledged importance of psychosocial factors in the management of patients with musculoskeletal conditions (e.g. Jack et al., 2010) challenges this situation and demands a greater integration within the MSc course.

In addition, practitioners observed the educator with patients, gaining insight into a higher level of practice and hearing the subsequent questions posed by the educator as they reflected on the encounter. The educator modelled a way of learning that triggered in the practitioner *'growth of the inner teacher'* (Daloz, 1999, p218). This highlights the value and effective role of a mentor with high levels of clinical expertise facilitating less experienced colleagues. While the CSP advocate workplace learning (Chartered Society of Physiotherapy, 2005a, 2005b), perhaps the value of direct observation has yet to be realised (Petty and Morley, 2009). The implementation of such mentorship with departments using the notion of critical companionship (Titchen, 2001) may not only develop a dynamic learning environment but may also be a cost effective and manageable way to support CPD within the workforce.

It should be remembered the model was developed from the *perceived* impact on alumni after completion of the course. A further limitation of the study was that it was carried out with alumni from only one MSc course in the UK. The findings have been constructed by the researcher from data co-created with the participants; and as such is caught in time and place. While the findings cannot automatically be generalised, they may be transferable to other similar situations.

5. Conclusion

The findings of this study add to the growing body of evidence of the effectiveness of MACP approved MSc programmes in developing the clinical expertise of practitioners. The attributes of expertise identified in this study are conceptualised within three developmental and inter-related strands: critical understanding of practice knowledge, patient centred practice and a capability to learn in, and from practice. These inter-related aspects of knowledge, practice and learning offer a new conceptual model of the development of practitioners towards clinical expertise. This developmental process towards autonomous and critically reflective practitioners may inform educationalists and practitioners who seek to promote clinical expertise within neuromusculoskeletal physiotherapists.

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