

Learning to be a physiotherapist

Ingrid Lindquist



**Karolinska
Institutet**

Stockholm 2006

Cover and illustrations by Henrik Lindquist

Published and printed by Repro Print AB, Stockholm
info@reproprint.se

Correspondance to:
ingrid.lindquist@ki.se

© Ingrid Lindquist, 2006
ISBN 91-7140-723-5

To the physiotherapy students

*”Through seeking we may learn and know things better.
But as for certain truth, no man hath known it,
...The final truth, he would himself not know it;
For all is but a woven web of guesses.”*

Xenophanes, 400-500 years BC

ABSTRACT

Few studies have explored student experience of learning in physiotherapy and none has explored student experience throughout an education programme from a student perspective. The traditional role of physiotherapists as responsible for evaluation, diagnosis and treatment of the individual patient has changed and is expected to develop and expand due to radical changes in aim and focus of health care. Knowledge of students' experience of learning may help to ensure curriculum development to meet these needs. The aim of the work reported in this thesis was to explore students' experience of learning to be a physiotherapist in a three- year programme.

A longitudinal study followed physiotherapy students over a three- year period. A qualitative phenomenographic approach was used. A cohort of twenty-one students from Sweden and the UK was purposefully selected by sex, age, earlier work experience and educational background to ensure diversity. Semi-structured interviews were carried out with the students at the beginning of the programme and then after each term. One hundred and eleven interviews from four component studies were analysed. This was followed by a metasynthesis of the findings of the four single studies to capture the longitudinal character of variation in learning experience throughout the education programme.

New students' expectations of the professional role ranged from a concern to learn how to behave as a physiotherapist, to be able to work with physical problems of movement, to be able to focus on the needs of the patient in illness and health and to communicate to find ways to help patients with mental and physical problems (Study I). Valued learning experience from the first year was described as learning from support and feedback, others and self, from observing and from participating (Study II). Discrete development pathways identified through the first five terms were searching for evidence, employing skills, communicating with others and reflecting on practice (Study III). On the threshold of working life professional identities were revealed as the 'treater', the 'educator' and the 'empowerer' (Study IV). Through a metasynthesis study from the findings of the four original studies three patterns of learning, ranging from a cognitive to a cultural view of learning, are described as 'performing treatment', 'solving problems' and 'managing health'. They indicate differences in learning to be a physiotherapist in the focus of learning, the ways in which the learning occurred, and together with whom and in what context learning took place.

Patterns of learning identified over a physiotherapy education programme show a variety in learning focus and in ways of learning. Differences in patterns of learning can be related to different views of knowledge and learning. Experience of learning is influenced by the context in which learning occurs. Experience of learning is influenced by learning partners participating in the physiotherapy activity. The work offers to staff in physiotherapy education insights into students' learning experience that may help students and staff to achieve desired educational outcomes.

Key words: learning, physiotherapy student, physiotherapy education, phenomenography, curricula development

Ingrid Lindquist, 2006
ISBN 91-7140-723-5

SAMMANFATTNING (Summary in Swedish)

Få studier har undersökt lärandet i sjukgymnastik och ingen har undersökt sjukgymnaststudenters erfarenheter genom hela utbildningen. Den traditionella rollen för sjukgymnaster med ansvar för undersökning, diagnos och behandling av den individuella patienten har förändrats och förväntas att utvecklas och ändras ytterligare genom de genomgripande förändringar av mål och innehåll som sker inom hälso- och sjukvården. För att möta de nya kraven kan kunskap om studenters erfarenheter av lärande bidra till att stödja utvecklingen av utbildningen. Avhandlingens övergripande syfte var att undersöka studenters erfarenheter av lärande under sin treåriga utbildning.

I en longitudinell studie följdes sjukgymnaststudenter under en treårsperiod. En kvalitativ fenomenografisk ansats användes. En grupp bestående av tjugoen studenter från Sverige och England valdes strategiskt med avseende på kön, ålder, tidigare arbetslivserfarenhet och utbildningsbakgrund för att säkerställa variationen i erfarenhet. Semistrukturerade intervjuer genomfördes med studenterna i början av utbildningen och sedan efter varje termin. Etthundraelva intervjuer från de fyra studierna analyserades. Genom en metasyntes analyserades därefter resultaten från de fyra ingående studierna, för att fånga upp variationen i de långsiktiga erfarenheterna av att lära under utbildningen.

Nya studenters uppfattningar av den professionella rollen rymde ett kontinuum av förväntningar från att kunna uppföra sig som sjukgymnast, till att kunna arbeta med fysiska rörelseproblem, att kunna fokusera på patienters behov vid hälsa och sjukdom och att hitta olika sätt att hjälpa patienter med mentala och fysiska problem (Studie I). Högt värderade erfarenheter av lärandet under det första året beskrevs som lärande genom att få stöd och feedback, att lära av andra och sig själv, att lära genom observation och genom att delta i ett kliniskt sammanhang (Studie II). Under de fem första terminerna lärde sig studenterna genom att söka evidens, att öva färdigheter, att kommunicera med andra och genom att reflektera över praktiken (Studie III). På tröskeln till arbetslivet upptäcktes och beskrevs olika professionella identiteter som 'behandlaren', 'utbildaren' och 'möjliggöraren' (Studie IV). De tre lärmönstren som identifierades tyder på att erfarenheter av lärandet skiljer sig avseende fokus, de olika sätt som lärandet sker på, vilka man lär tillsammans med och i vilken miljö lärandet äger rum. De sträcker sig från en kognitiv till en kulturell syn på lärande och beskrivs som att lära sig vara sjukgymnast genom att utföra behandling, att lösa problem och att hantera hälsa.

De identifierade lärmönstren under sjukgymnastutbildningen visar varierande fokus för lärandet och på olika sätt att lära. Olika lärmönster kan relateras till olika syn på kunskap och lärande. Erfarenheter av lärande påverkas av den miljö lärandet sker i. Erfarenheter av lärande påverkas av de lärtpartners som deltar i sjukgymnastiska aktiviteter. Kunskaper från denna avhandling kan ge studenter, lärare och handledare i sjukgymnastprogrammet insikter om studenters erfarenheter, som kan vara viktiga för att nå de utbildningsmål som eftersträvas.

Nyckelord: lärande, sjukgymnaststudent, sjukgymnastutbildning, fenomenografi, läroplansutveckling

Ingrid Lindquist, 2006

ISBN 91-7140-723-5

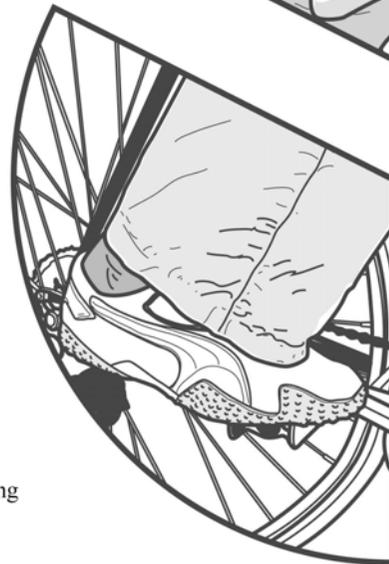
Thesis at a glance

From a student perspective
learning to be a physio-
therapist means



Performing treatment

Learning to cure body
structure/function by giving
treatment and instructing
patients in an exclusive
physiotherapy setting



Managing health

Learning to enable
individuals to move in an
every day life activity by
designing and/or organizing
activities for them



Solving problems

Learning to
solve movement
ability problems by
educating clients in a
rehabilitation setting

Study I

Professional socialisation: students' expectations about being a physiotherapist

Aim

To explore students' expectations about being a physiotherapist when entering their physiotherapy education programme

Findings

New students' expectations of the professional role as a continuum of perspectives ranged from a concern to learn how to behave as a physiotherapist, to be able to work with physical problems of movement, to be able to focus on the needs of the patient in illness and health and how to communicate to find ways to help patients with mental and physical problems. (Figure 1)

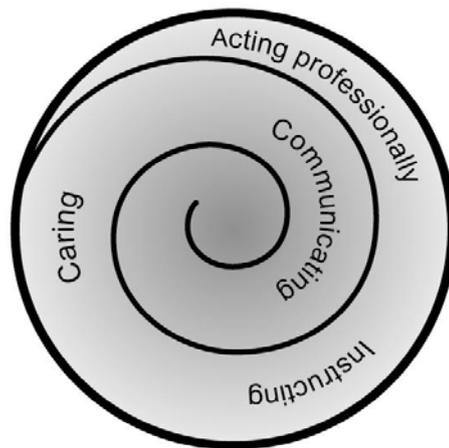


Figure 1. Students' expectations about being a physiotherapist emerged as a continuum of perspectives.

Conclusion

New entrants to physiotherapy education programme had different expectations about being a physiotherapist, which may influence their learning experience

Study II

Early learning experience valued by physiotherapy students

Aim

To explore the learning experience valued by first- year physiotherapy students.

Findings

Four different and separate themes of valued learning experience during the first year of physiotherapy education were identified and described.

Learning from **Support and Feedback**

Learning from **Others and Self**

Learning from **Observing in Clinical Practice Settings**

Learning from **Participating in a Clinical Context**

Conclusion

In the first year of study, students perceived significant learning from experience that involved them in interaction, in observation and in hands-on practice in real health-care and rehabilitation contexts

Study III

Development pathways in learning to be a physiotherapist

Aim

To explore physiotherapy students' experience of situated learning and change through terms 1-5

Findings

Students' experiences of learning through semester 1-5 in the physiotherapy education programme were described in four qualitatively different but equal development pathways. All pathways included theoretical knowledge as well as skills and attitudes related to the profession and were learnt with different focus and in different ways. The development pathways were described as

Searching Evidence in which formal knowledge and confirmation in practice is looked for

Performing Skills in which learning occurs by doing, often related to performing techniques

Communicating with Others in which preferred learning opportunities are talking with other students and teaching staff

Reflecting on Practice in which reflection is an active tool of development

Conclusion

Discrete development pathways among students were identified throughout the education programme where each showed development towards competence and ability for practice as a physiotherapist.

Study IV

Physiotherapy students' professional identity on the threshold of working life

Aim To explore characteristics of graduating physiotherapy students' professional identity before leaving the university

Findings

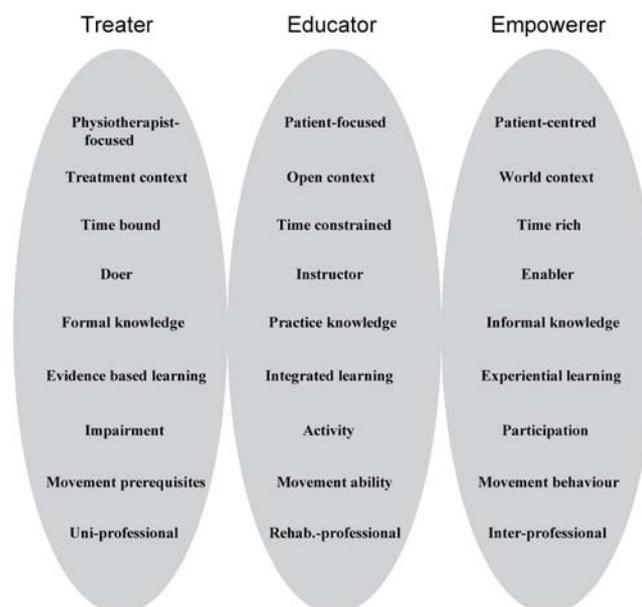


Figure 2. Three different categories of graduating students' professional identity as a physiotherapist, described as the 'empowerer', the 'educator' and the 'treater'.

Conclusion There was diversity in the ways graduating students identified with their profession and a variation of concepts about being a professional.

LIST OF PUBLICATIONS

- I. **Professional socialization: students' expectations of being a physiotherapist**
Richardson B., Lindquist I., Engardt M., Aitman C.
Medical Teacher 2002; 24: 622-627.

- II. **Early learning experiences valued by physiotherapy students**
Lindquist I., Engardt M., Richardson B.
Learning in Health and Social Care 2004; 3: 17-25.

- III. **Development pathways in learning to be a physiotherapist**
Lindquist I., Engardt M., Poland F., Garnham L., Richardson B.
Physiotherapy Research International 2006, accepted

- IV. **Physiotherapy students' professional identity on the edge of working life**
Lindquist I., Engardt M., Poland F., Garnham L., Richardson B.
Medical Teacher 2006, E-pub ahead of print. DOI:10.1080/01421590600605272

All previously published papers reproduced with permission from the publisher.

CONTENTS

1	INTRODUCTION	11
2	BACKGROUND	12
2.1	Learning.....	12
2.1.1	Professional socialisation.....	12
2.2	Physiotherapy knowledge	12
2.2.1	Developing physiotherapy knowledge.....	13
2.2.2	Medical influence on physiotherapy knowledge.....	13
2.2.3	Developing practice knowledge.....	14
2.2.4	Developing physiotherapy education in Sweden	14
2.2.5	Learning physiotherapy in a global context	14
2.3	Changes in health care	15
2.3.1	Health – disease panorama	15
2.4	Expectations on the physiotherapy profession	16
2.5	Rationale.....	16
3	GENERAL OBJECTIVES	17
3.1	Specific objectives	17
4	METHODS.....	18
4.1	Design.....	18
4.2	Respondents.....	18
4.3	Phenomenographic method.....	19
4.4	Content analysis.....	20
4.5	Metasynthesis study	21
4.6	Data collection	21
4.7	Data analysis.....	22
4.8	Ethical approval	22
5	FINDINGS.....	23
5.1	Metasynthesis study	23
5.1.1	Performing treatment.....	26
5.1.2	Solving problems.....	27
5.1.3	Managing health.....	28
5.2	Study I	29
5.3	Study II.....	30
5.4	Study III.....	31

5.5	Study IV	32
6	DISCUSSION	34
6.1	From a cognitive to a cultural view of learning	34
6.2	Learning as context specific	34
6.3	Recommendations to education.....	35
6.3.1	Patterns of learning	35
6.3.2	Influence of context	37
6.3.3	Curricula.....	37
6.3.4	A new learning cycle	38
6.4	Methodological considerations.....	38
6.4.1	Concepts in qualitative research.....	38
6.4.2	Trustworthiness	39
6.4.3	Respondents.....	39
6.4.4	Metasynthesis study.....	39
6.5	Future research.....	40
6.6	Conclusions and implications.....	41
6.6.1	Conclusions from the metasynthesis study.....	41
6.6.2	Conclusions from studies I-IV	41
6.6.3	Implications for physiotherapy education	42
7	ACKNOWLEDGEMENT	43
8	REFERENCES	46

LIST OF ABBREVIATIONS

BOLOGNA	Bologna Declaration. European University Association
CSP	Chartered Society of Physiotherapists, UK
DoH	Department of Health, UK
ENPHE	European Network of Physiotherapy in Higher Educations
HPC	Health Professions Council, UK
ICF	International Classification of Functioning, Disability and Health
ICIDH	International Classification of Impairment, Disability and Handicap
KI	Karolinska Institutet
LSR	Legitimerade Sjukgymnasters Riksförbund (Chartered Society of physiotherapists, Sweden)
SOU	Statens offentliga utredningar (Swedish government document)
SoS	Socialstyrelsen (Swedish Board of Health and Welfare)
WCPT	The World Confederation of Physical Therapy
WHO	World Health Organisation

1 INTRODUCTION

Physiotherapy has existed as a field of knowledge for almost 200 years (Ling, 1840). The physiotherapy profession and discipline has developed and changed over time. The aim of physiotherapy is to support people's health through movement (The Swedish Association of Registered Physiotherapists (LSR), 1998). The ways physiotherapists have worked have developed from early treatments carried out according to doctors' referrals with a pre-constructed treatment plan aimed at restoring functional disorders, to current treatment in which the physiotherapist decides how to approach patients' movement problems. Today there is a call for physiotherapists and other health-care professionals to meet individual and diverse needs of patients in health care with radical changes in aim and focus and a move from care in acute hospital settings towards primary and community care.

Physiotherapists are expected to be able to adapt to changing needs, to carry out their work in a variety of environments and settings and in multidisciplinary teams (Department of Health (DoH), 2001; Statens offentliga utredningar (SOU), 2001). Social and cultural diversity has further challenged health care professionals to interact with clients from different cultures as well as with multicultural teams (Barr, 1998). Multidisciplinary care is focusing increasingly on life long management of chronic disease in primary and community health care (DoH, 2005; Socialstyrelsen (SoS), 2004). Similar to other health care professionals the curriculum for physiotherapy education needs to reflect such changes promptly (Jones et al., 2001).

Patients' participation in and rights to health care are governed by legislation (SoS, 1982). This is supported by World Health Organization guidance centred on bodily health in relation to a person's activities and social participation in the context of his/her environment and in relation to personal factors (World Health Organisation (WHO), 2001). The rapid change in health care, with encouragement of flexible teamwork in community health care settings and recognition of a new, more knowledgeable, patient entitled to influence treatment and rehabilitation, point to changing work experience for physiotherapists. They will be working more independently, away from colleagues and in health-care contexts that change according to the individual patient. This endorses a need for knowledge of how students learn through their experience in education with the intention of informing modern curriculum design.

2 BACKGROUND

2.1 LEARNING

The theoretical foundation and framework of learning theories have different traditions with roots in different disciplines. The *quantitative* tradition of learning is concerned with memory, cognitive structures, processes and intelligence, studied primarily in controlled experiments in the discipline of psychology as described by Marton & Booth (1997). Such research is guided by a quantitative view of knowledge, and learning is viewed as the individual reproducing existing, explicit, stable and true knowledge. Thus knowledge can be seen as independent of the individual: knowledge and skills are discrete from the person and can be transferred between people without change.

With the notion of construction of personal understanding (Rogers, 1969), learning was increasingly viewed as discovered and interpreted by the individual as well as experience-based. The constructionist philosophy is concerned with how people individually make sense of their world and can be seen as part of a *qualitative* tradition. In this perspective knowledge is personal, and therefore the content of learning and ways of learning are integrated and inseparable (Marton et al., 1977). Learning in the qualitative tradition, with roots in anthropology, is proposed to be something interpreted and personal. Knowledge is constructed together with others in specific situations. In this perspective learning is seen as a sociocultural process between people and their specific worlds (Lave & Wenger, 1991; Lave, 1998; Säljö, 2000; Rogoff, 1990, 2003).

2.1.1 Professional socialisation

Besides theory and professional skills, professional socialisation is recognized as the process through which individuals learn the norms, attitudes and beliefs of their profession (Wollmer & Mills, 1966). This refers both to formal knowledge, skills, rules and to informal tacit knowledge within the profession. However, few studies with emphasis on professional socialisation have specifically addressed the physiotherapy profession (Abrandt, 1997; Lopopolo, 2001; Richardson, 1997; Öhman, 2001) but can be seen in other health care professions (Bellner, 1999; Brown & Greenwood, 1999; Howkins & Ewens, 1999; McKenna et al., 2001; Ponzer et al., 2004; Whiteford & Wright St.-Clair, 2002). Professional socialisation gradually leads to a professional identity (Wenger, 1988). Socialisation is regarded as a life-long process, suggesting that professional identity may change and develop (Clarke, 1997; Wenger, 1998). It is suggested that the awareness of professional socialization is not fully reflected in European physiotherapy curricula.

2.2 PHYSIOTHERAPY KNOWLEDGE

Physiotherapy knowledge is described by the World Confederation of Physical Therapy (WCPT) (1999). Physiotherapy interventions are described as consistent in all settings.

“physical therapists’ distinctive view of the body and its movement needs and potential is central to determining a diagnosis and an intervention strategy and is consistent whatever the setting in which practice is undertaken. These settings will vary in relation to whether

physical therapy is concerned with health promotion, prevention, treatment or rehabilitation”
(WCPT, 1999).

This points to a view of knowledge as consistent, unchangeable and reproduceable. The Swedish definition of the scope and field of practice suggests a broader view of physiotherapy knowledge as integrated with practice and sensitive to different contexts.

“ Interventions with the aim to prevent or rehabilitate are based on an evaluation and analysis of physical capacity and problems of the patient/client with regard to psychological and social factors including relevant environmental aspects. With the patient/client as an active partner, interventions, treatments and learning strategies aim at making the individual aware of his/her physical resources and thereby improve the potential of the individual to cope with the demands of daily living.” (The Swedish Association of Registered Physiotherapists (LSR), 1998).

2.2.1 Developing physiotherapy knowledge

Even though exercise and movement therapy have been used in health care since time immemorial modern physiotherapy in Sweden was developed by Ling (Lundbladh, 1993). His medical gymnastics were integrated with knowledge of anatomy and physiology (Ling, 1840) and later of biomechanics. Physiotherapy practice thus integrated theories of structure and function of the body with knowledge of movement, with the aim of restoring people’s health (Kungliga Gymnastiska Centralinstitutet, 1988). In this sense practice knowledge of medical gymnastics is close to the notion of physiotherapy as a body of knowledge developed in practice, and used by the physiotherapy profession and individuals in that profession (Higgs et al., 2004). Physiotherapy knowledge within medical gymnastics, it is suggested, had concrete base with a “movement bank” from which it was possible to retrieve and reproduce exercises for patients with no consideration of change in different situations or between individuals. The concept was linked to a quantitative view of knowledge and learning as dealing with a finite amount of material stored within the individual and possible to augment when it was transferred from a more knowledgeable person to a learner.

2.2.2 Medical influence on physiotherapy knowledge

Recognition of the need for extended medical knowledge towards the end of the nineteenth century turned physiotherapists in Sweden to the field of medicine. Doctors became responsible for the development of physiotherapy as a profession and were therefore the mediators of knowledge (Broberg, 1993). From working in private care units, physiotherapists moved to hospitals, implementing other professionals’ medical diagnoses, as ‘doctors’ technicians treating patients according to doctors’ referrals (Lundbladh, 1993; Ottosson, 2005). If doctors represented, and were responsible for the development of knowledge in physiotherapy, it surely follows that the body of knowledge was regarded as ‘outside’, ‘separate from’ the physiotherapists themselves. As doctors and physiotherapists did not share practice, knowledge transferred from the former to the latter had to be theory-based, generic, explicit and possible to replicate. It entailed “knowing *that* ...” i.e. knowing about physiotherapy as opposed to “knowing *how*”, i.e. knowing how to carry out physiotherapy (Ryle, 1949) as demonstrated by physiotherapists in their work. It may also

explain the ‘theory-practice’ gap recognized in physiotherapy (Richardson, 1993) and other professions (Eraut, 1994).

2.2.3 Developing practice knowledge

Practice knowledge, described as knowledge used by a profession and individuals in that profession, comprises propositional components (theory), professional craft components (professional skills) and personal knowledge (attitude) (Higgs & Titchen, 1995). Propositional knowledge is derived from research and regarded as scientific. Professional craft is individual and is regarded as being learnt from professional experience. Personal knowledge is developed from individual experience (Higgs et al., 2001). This view of practice knowledge suggests that different forms of knowledge are integrated and related to physiotherapy contexts in practice. An integration of theory and practice within physiotherapy has long been sought e.g. there is still research into how practice knowledge is developed (Abrandt, 1997; Richardson, 1997, 1999; Öhman, 2001; Higgs et al., 2001, 2004).

2.2.4 Developing physiotherapy education in Sweden

When physiotherapy education was linked to the medical universities, propositional physiotherapy knowledge was transferred from doctors to students with an assumption that knowledge was true and false by definition. Physiotherapy interventions were used for implementing orthopaedic, neurological diagnoses and heart-lung conditions. Theoretical knowledge was taught by doctors, and education was strongly influenced by the medical profession until the nineteen-seventies (Askling, 1987). Expectations of problem-based reasoning and working were raised when physiotherapy education achieved university status in 1977. With increasing professional independence, physiotherapy interventions became based on analysis through a problem-solving model: the “physiotherapy process” (Tyni-Lenné, 1983). The theoretical model of physiotherapy developed by Hislop (1975) was further developed as a model of human movement by Tyni-Lenné (1988) and related to the International Classification of Impairment, Disabilities and Handicaps (ICIDH) (WHO, 1980) and later to the developing International Classification of Function, Disability and Health (ICF) (WHO, 2001).

In 1993 Swedish physiotherapy education became a three-year education programme with a bachelor’s degree qualification, planned, managed and evaluated by physiotherapists. The aim of the 1993 curriculum was to support students to gain professional competence and to work as independent, critically thinking practitioners. (Karolinska Institutet (KI), 1993). On completion of education, students were expected to have acquired a level of professional competence, a professional role and a certain academic level.

2.2.5 Learning physiotherapy in a global context

A changing world of health care will include movement of physiotherapists between countries, which is encouraged in physiotherapy programmes throughout Europe. Increased interaction both with developing countries and other European countries with expected and increasing mobility suggests that it is important not only to understand the physiotherapy microcultures in one’s own country but also those of other countries. The European

Network of Physiotherapy in Higher Education (ENPHE) was formed to encourage debate amongst physiotherapists in Europe about educational quality standards and unite departments of physiotherapy (Stappaerts, 1996). Such an aim was recommended by physiotherapists in Europe and the World Confederation for Physical Therapy, and could unite departments of physiotherapy globally.

Since the Bologna Declaration (Bologna, 1999), now involving more than forty countries and intended to influence all higher education in Europe (Regeringen, 2004), increasing mobility of professionals has been expected. The requirement to accept professionals from other European countries will place demands on physiotherapy education programmes throughout Europe to develop a common, agreed standard and to develop physiotherapy knowledge together. Internationalisation of physiotherapy education programmes with extensive international exchange of students and teachers can be valuable to meet this development.

There is much to be gained in encouraging networks between teaching staff and studies such as the present longitudinal study developed by educators from Sweden and the UK through mutual interest in professional growth and the development of physiotherapy education. This multiphase longitudinal study of a cohort of Swedish and English students' learning experience is one example of European collaboration in the field. Such collaboration foreshadows a common base for physiotherapy education and joint knowledge development.

The ICF (WHO, 2001) is seen as an aid in developing a common frame of reference for both education and research. The classification model has the character of system theory. Common terms and concepts permit use by different international, professional groups in different situations in health care and elsewhere, suggesting a common framework of reference in teamwork and collaboration.

2.3 CHANGES IN HEALTH CARE

2.3.1 Health – disease panorama

An estimated 7-10% of the world population have a disability – more than five hundred million people are living with disease (Brundtland, 1999). The proportion of elderly people is growing rapidly (Haglund & Rosén, 2001; Anell & Hjortsberg, 2005; Hjort, 2006; DoH, 2005). In Sweden it is estimated that people over seventy five years or more will represent more than a tenth of the population in 2020. The growing proportion of elderly people will have most decisive effect on the future disease panorama. In addition long term mental conditions, diabetes, obesity and physical inactivity will be a challenge to health care (Haglund & Rosén, 2001). Increasing numbers of old people with long term disorders, together with a decrease in days spent in hospital (halved in Sweden between 1992 and 2001), suggest a specific challenge to physiotherapy.

Where the nineteenth century was dominated by communicable diseases and the twentieth by long time conditions, the Third Era of Health now proposed by Breslow (2006) suggests an era when health is a resource for living the life people want (ibid), with sharper focus on health promotion and participation in active life styles.

2.4 EXPECTATIONS ON THE PHYSIOTHERAPY PROFESSION

The new health policy in Europe foresees significant changes in a broader workforce with population-based health principles and a philosophy of prevention. This points to the need for adapting health education curricula (Maudsley & Strivens, 2000; el Ansari et al., 2003) and finding strategies to encourage students to develop into fit practitioners (Vaughn, 2003) in modern health care.

Primary care is now responsible for long management care in Sweden (Anell & Hjalte, 2004). The purpose of health care changes in Europe is to deliver improvements for patients, clients and the public by changing the way the whole system works: changes in behaviour, culture and processes to place the individual at the heart of things (DoH, 2000). With increased emphasis on health promotion and client participation in active lifestyles, a growth in the demand for both teaching and treating is anticipated. Competence in managing service quality audits and a range of research methodologies in the workplace is expected of new graduates, as described in the UK Health Professions Council (HPC), (2003). As well as possessing clinical skills new graduates are expected to be able to work in a team *and* on their own initiative, with communication and management skills and with an orientation and ability to engage in lifelong learning and reflection on their development (ibid).

Changes in views of health and health care affect the traditional medical model of treatment in hospitals and consequently physiotherapy and the generation of knowledge. Patient-centred care is supported by WHO, with a radical change in the conceptualisation of disability and handicap in a recent classification of functioning, disability and health. This considers the bodily function in relation to an individual's activities and social participation in the context of his/her environment and person (WHO, 2001). The challenge to physiotherapy education is to take an active role in preparing students for modern primary- and community-based care (Edwards et al., 2003) as do other health care professions (Howe et al., 2002; Maudsley & Strivens, 2000; Astin et al., 2005; Morrison, 2006). The opportunities for physiotherapists to contribute to health-care are growing in step with the increase in the proportion of elderly people (Haglund & Rosén, 2001), who desire to develop and maintain health as long as possible (Breslow, 2006).

2.5 RATIONALE

Learning theories, developments in physiotherapy and physiotherapy education, the new disease panorama and a changing health care system – all call for curricular change. Earlier studies have been carried out within a context of professional socialisation (Abrandt, 1997; Richardson, 1997, 1999; Lopopolo, 2001; Öhman, 2001). A search of the AMED, Cinahl, EMBASE, Eric, PsychInfo and PubMed databases from 2000 to 2006 shows no study that has invited physiotherapy students to share their experience of learning the theoretical base, the skills and attitudes of the profession over the duration of a physiotherapy education programme. Such a study elucidates students' views of the role and purpose of physiotherapy and of different modes of learning to be a physiotherapist. This knowledge will constitute an important basis in developing curricula for physiotherapy education.

3 GENERAL OBJECTIVES

The overall aim was to explore students' learning to be a physiotherapist over a three year education programme from a student perspective. (Metasynthesis study).

3.1 SPECIFIC OBJECTIVES

- to explore students' expectations about being a physiotherapist when entering their physiotherapy education programme (Study I)
- to explore learning experience, valued by first year physiotherapy students (Study II)
- to explore physiotherapy students' experience of situated learning and change through term 1-5 (Study III), and
- to explore characteristics of graduating physiotherapy students' professional identity before leaving university (Study IV).

4 METHODS

4.1 DESIGN

The present longitudinal research project followed physiotherapy students over a three-year period. The aim was to capture the diversity of experience in learning to be a physiotherapist, in order to support curricula development. A cohort of students from Sweden and the UK was followed from their entry to university physiotherapy education to their leaving for a professional life as physiotherapists. The students were interviewed at the beginning of their education and at the end of each term by researchers from each country to capture and describe their learning experience. Supported by an interview guide, all the interviews started with an opening question to prompt a dialogue about the interviewees' learning experience. One opening question and interview guide was used for Study I, another for Studies II and III and a third for Study IV. Transcripts from interviews with students were analysed in Study I, III and IV according to the phenomenographic method (Dahlgren & Fallsberg, 1991). Furthermore content analysis (Merriam, 1988) was carried out in study II to illuminate themes of learning related to the experience of first-year students. The first interview explored the expectations physiotherapy students had of being a physiotherapist (Study I). Interviews from terms one and two investigated physiotherapy students' early learning experience (Study II). Differences in development pathways of learning experience were studied from terms one to five (Study III). Before leaving the university at the end of term six, further interviews were conducted to analyse and describe the professional identities the students had on leaving university (Study IV). A metasynthesis study of the findings of the four single studies was carried out to capture the longitudinal character of variation in learning experience through the three-year programme and to relate them to learning theory. (Table 1)

4.2 RESPONDENTS

All first-year students at each university were informed about the study at the beginning of their undergraduate physiotherapy education and invited to participate. Their right to withdraw and assurance that no teaching staff who was their personal advisors or examiners would be their interviewer were made clear and they were assured that their data would be handled confidentially. A cohort of 10 Swedish and 8 English students were strategically selected at the start of their education to include males and females, mature students and school-leavers, those with high entry qualifications and those with low, with and without previous health-care experience and previous employed work experience within or outside health care (Table 2). The sample was selected to ensure a rich diversity of the phenomenon of learning to be a physiotherapist. Most of the students completed the education programme. When a student left due to pregnancy, change of career, travelling or working, others were invited to join the study to maintain maximum variation of learning experience. Additionally, due to problems in reaching students one hundred eleven interviews in all were collected and analysed.

Table 1. Design of the four component studies and the metasynthesis study including time and numbers of material, methods of analysis and opening questions.

Study	Time	Material	Method of analysis	Opening question
Study I Expectations of being a Physiotherapist	Beginning education	18 interviews	Phenomenography	Question 1 Please tell me about one important thing you hope to learn to help you become a physiotherapist?
Study II Early learning experience	Terms 1-2	31 interviews	Content analysis	Question 2 Please tell me about one situation you experienced during the term that you found important in learning to become a physiotherapist?
Study III Development pathways in learning	Terms 1-5	75 interviews	Phenomenography	Question 2 Please tell me about one situation you experienced during the term that you found important in learning to become a physiotherapist?
Study IV Professional identity	Term 6	18 interviews	Phenomenography	Question 3 Please tell me about one patient you as a physiotherapist have found interesting, somebody who sticks in your mind. It could be anyone you have come across?
Metasynthesis (Studies I-IV) Students' learning patterns		Findings from Studies I-IV	Metasynthesis Phenomenography	Question 4 How does the experience described by physiotherapy students along their pathway through education reveal the learning process?
		111 interviews		

Table 2. Characteristics of the initial cohort of students in the present thesis

Age, md, (range)	Gender f/m	University degree	University studies	School leavers	Health care work	Other work
md 23 years (18-42 years)	14/4	1	5	4	3	7

4.3 PHENOMENOGRAPHIC METHOD

Phenomenography was the research approach used (Study I,II,IV and in the Metasynthesis study) because it focuses onto the experience and acknowledges different ways of perceiving a phenomenon, knowing about it and having skills related to it. Through interviews, individuals' experiences are revealed, formulated and described in categories of

descriptions based on differences and similarities (Marton, 1981). Variation in experience can be described as a variation between individuals (Dall'Alba, 2002; Sjöström & Dahlgren 2002), as in the four component studies in this thesis, or as a variation of aspects within an individual. The critical aspects of a phenomenon are then discerned and focused on simultaneously by an individual but some aspects are in the foreground and others in the background (Marton & Booth, 1997). The purpose to capture the different ways of experiencing a phenomenon is based on the assumption that every phenomenon can be experienced in a number of qualitatively different ways (Marton 1981). The outcome space, meaning all categories of descriptions together and the relationship between the categories, is finite but not closed, meaning that variation of ways can develop and change over time (Marton & Booth, 1997).

Phenomenography is a tradition in educational research in which knowledge was first seen as individuals' thinking, an individual construction of a phenomenon in the surrounding world (Marton, 1981). It was not until later that the context was taken into consideration and learning was viewed as a social construction. It was argued that "our experience of the situation is moulded by the phenomena as we experience them, but our experience of the phenomena is modified, transformed and developed through the situations we experience them in" (Marton & Booth 1997 p 83). Understanding the context and taking it into account in the phenomenographic tradition is demonstrated in descriptions of using new knowledge in new situations, using it differently and to doing something different (ibid).

The basic structure of learning is viewed as containing "the What" representing the content of learning and "the How" representing the way something is learnt (Marton, 1981). Variation in learning outcome can not be understood without relation to the content of learning. Marton & Booth (1997) draw on the Austrian philosopher Brentano who stated "no hearing without something heard, no believing without something believed, no hoping without something hoped, no striving without something striven for, no joy without something we are joyous about etc" (Marton & Booth, 1997 p 84). In a phenomenographic view ability, in a generic sense, can be described as ways of understanding, knowing about, and having skills related to different content. Differences in outcome are viewed in relation to some "same" situation, the same phenomenon (Marton et al., 2004).

The socio-cultural theory of learning informed phenomenographic research, as learning gradually was viewed as a change in the person-world relationship reflected in talking, doing and in social artefacts (Säljö, 2000). What is learnt, how it is learned, when and where learning takes place are considered by phenomenographic research. The development of the assumptions of learning underpinning phenomenography suggested the possibility and relevance of using the phenomenographic research method to study students' experiences of learning to be a physiotherapist.

4.4 CONTENT ANALYSIS

Content analysis was used (Study II) as it focuses on qualitative different themes related to a phenomenon in the surrounding world (Merriam, 1988). Data is collected from interviews with strategically selected respondents to find themes with recurrent regularities and rich information. Each theme should be both comprehensive and illuminating. Lincoln & Guba

(1985) have suggested four guidelines for developing themes. They relate to frequency, importance, visibility and uniqueness. How often a unit of information appears, the importance a theme seems to have to the reader, how it stands out and if it is revealing something special, should be accounted for.

All content related to the research question, are gathered through cross case analysis meaning that the content is gathered across interview transcripts. Units of information, seen as items of information, from transcribed interviews are described in a manageable amount of different themes. Content analysis in this study was seen to link as a component stage of analysis in the over-arching research approach and emerging design of qualitative research and phenomenography.

4.5 METASYNTHESIS STUDY

The metasynthesis study was used to analyse findings from Study I-IV, in order to create new interpretation (Finfgeld, 2003). It is a process where the findings from across multiple qualitative studies are broken down, examined anew, and then combined into a new whole. In relation to the data this metasynthesis study was considered to be conceptual/thematic, suggesting an interpretative explanation according to a typology by Sandelowski and Barosso (2003). Metasynthesis, developed from the former concept of aggregated analysis, is a way to gather “pockets of research” (Estabrooks et al., 1994 p. 507). It is proposed that a metasynthesis study can be carried out if the findings are judged to be trustworthy and each study is grounded in data and retrieved from similar but not identical situations. Comparable themes and categories should be shown from the different studies. A new question should be asked to the findings (Estabrooks et al., 1994).

4.6 DATA COLLECTION

The focus in data collection was the experiences of students of the phenomenon of learning to be a physiotherapist. Data of their experiences were collected by audio-taped interviews carried out by the researchers in Sweden and the UK. Each interview, between forty and seventy five minutes long, was semi-structured and started with the same question. At the beginning of the education programme the request was: “Please tell me about one important thing you hope to learn to help you become a physiotherapist?” (Study I). At the end of semester one through five, each interview started with the question: “Please tell me about one situation you experienced during the term that you found important in learning to become a physiotherapist?” (Study II and III). At the end of the education programme in semester six the interview began with the request: “Please tell me about one patient you as a physiotherapist have found interesting, somebody who sticks in your mind. It could be anyone you have come across?” (Study IV). Each request was intended to facilitate students to choose a concrete situation as a starting point for discussion, to prompt exploration of students’ concepts of learning experience. Interview guides (Study I-IV), agreed and developed among the researchers in both countries was used to focus interviews and to probe students’ understanding of learning to be a physiotherapist (Kvale, 1996).

4.7 DATA ANALYSIS

Interviews were transcribed verbatim and analysed by the phenomenographic method (Dahlgren & Fallsberg, 1991) at first within and then across countries (Study I, III, IV). Reading of and familiarization with the transcripts led to the identification of meaning units in interview transcripts of the students. Condensed transcripts were compared for similarities and differences and were then grouped together in qualitatively distinct and different categories. The categories were described and assigned titles by the researchers in Sweden and the UK. Cross country analysis was carried out on a number of occasions when all the researchers met and a sample of Swedish interviews was translated into English. A joint discussion between the researchers (physiotherapists, occupational therapist and a sociologist in Study III and IV) in the two countries further refined and agreed the category descriptions and titles through negotiated consensus (Wahlström et al. 1997). The categories were then examined for their relationship to each other.

In addition to the phenomenographic analysis a content analysis (Merriam, 1988) was carried out (Study II) as a preparatory part leading to the phenomenographic analysis in Study III and IV. Through the content analysis words, phrases and sentences related to preferred learning experiences were identified in the first and second semester interview transcripts. These were coded and grouped in different themes. Agreed descriptions of themes in students' learning experiences were formulated and given titles. In both the phenomenographic and content analysis quotations were chosen to illustrate and highlight student experiences.

In order to obtain a more nuanced understanding of learning to be a physiotherapist an analysis of the findings from the four studies (Study I-IV), a metasynthesis study (Finfgeld, 2003) was carried out. The new question addressed to the findings of the four original studies in learning to be a physiotherapist was: "What do the experiences described by physiotherapy students through an education programme reveal about learning to be a physiotherapist?" The findings from the four studies were now seen as the raw data which could produce new integrative knowledge (Finfgeld, 2003). The relationship between the findings represented the learning processes over time. The author of the thesis carried out the analysis, which is seen as an advantage as she was close to the original data and context (McCormick et al., 2003). A phenomenographic approach to analysis was used to analyze differences and similarities in the findings from the four studies (Marton, 1981) with the aim of describing the phenomena of learning physiotherapy throughout an education programme.

4.8 ETHICAL APPROVAL

The study was approved by the ethics committees of the two respective institutions namely, the University of East Anglia, UK in 1999 and Huddinge University Hospital, Sweden in 2000.

5 FINDINGS

5.1 METASYNTHESIS STUDY

This study is a descriptive interpretation of learning physiotherapy. Changes in learning activities are identified from early in the three years education programme when a focus is onto listening, observing and carrying out limited skills by a novice physiotherapy student to the end of the three year programme when the focus is onto participating in all physiotherapy activities by a physiotherapist recognized as a full member of the profession of physiotherapy. The findings from the analysis of the four original studies are presented as decontextualized descriptors in three different patterns of learning. They range from a cognitive to a cultural way of learning to be a physiotherapist. Within the different patterns it can be seen that the ontology, the view of the patient and epistemology, the perspectives of knowledge and learning are different. Within all patterns it is expected that students learn to influence health through movement and that the learning process involves learning theoretical knowledge, skills and professional attitudes. However, the experiences are different regarding orientation towards patients/clients/persons and aim and focus of learning, the ways in which the learning activity occurs, together with whom and in which context learning takes place. These differences are described in three patterns of learning to be a physiotherapist (Figure 3) and are based in the four component studies (Figure 4).

Performing treatment

Learning to cure body structure/function by giving treatment and instructing patients in an exclusive physiotherapy setting

Solving problems

Learning to solve movement ability problems by educating clients in a rehabilitation setting

Managing health

Learning to enable individuals to move in an every day life activity by designing and/or organizing activities for them

	COGNITIVISM → CULTURISM		
	PERFORMING TREATMENT	SOLVING PROBLEMS	MANAGING HEALTH
	Learning to cure body structure/function by giving treatment and instructing patients in an exclusive physiotherapy setting	Learning to solve movement ability problems by educating clients in a rehabilitation setting	Learning to enable individuals to move in an every day life activity by designing and/or organizing activities for them
WHAT	Manual skills Treatment - facts Perform/instruct Knowledgeable	Educating skills Practice - experiential Teach/motivate Empathizing	Empowering skills World - multidimensional Organize/create opportunities Resource
HOW	Doing Hands	Communicating Education	Reflecting Physiotherapist as a person
LEARNING PARTNERS	Physiotherapy experts	Client/colleagues	People and their significant others
CONTEXT	Physiotherapy setting	Rehabilitation setting	Everyday world of people
VIEW OF	Role model Patient Facts and manual skills Transfer	Discussion partner Client Education skills Discovery	Resource Person Empowering skills Creation

Figure 3. From a cognitive to a cultural view of learning.

Three patterns of learning to be a physiotherapist, being different regarding what is learnt and how learning occurs, together with whom and in what context learning takes place, and in the view of teaching staff, patients/clients/persons and of knowledge and learning.

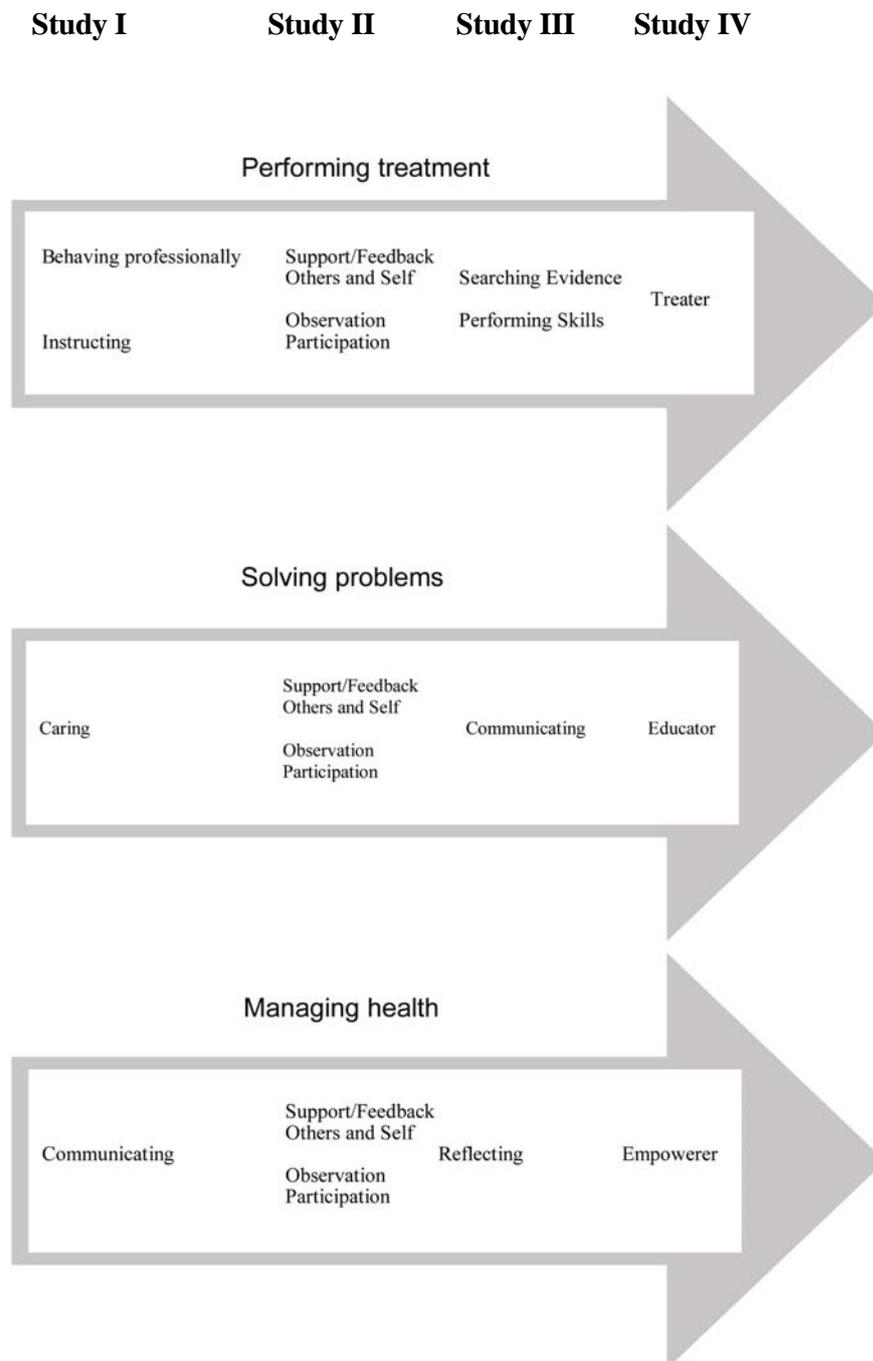


Figure 4. Performing treatment, solving problems and managing health as three different patterns of learning based in the four component studies exploring physiotherapy students' expectations of being a physiotherapist, of valued learning experiences, of development pathways of learning and of professional identities.

5.1.1 Performing treatment

Learning to cure body structure/function by giving treatment and instructing patients in an exclusive physiotherapy setting

The learning focus in the performing treatment pattern was how to cure movement injuries and restore mechanical movement limitations, in terms of range of movement, strength, endurance and balance. Learning meant acquiring **skills** to analyse, define and treat problems of body structure and function. Learning to be a physiotherapist was understood as acquiring formal knowledge and manual skills to cure the patient, restoring the movement injury and removing the limitation. The expectations of a newcomer in the education programme were to learn facts. A **knowledge base** was developed from facts from books and other publications where knowledge is made explicit. Learning was a process of knowledge generation which occurred through transfer from physiotherapy experts and from formal knowledge in books and published evidence. The **abilities** aspired to within this pattern were to perform manual skills and to instruct. The acquired abilities were viewed as stable, i.e. unchanged when transferred between different settings and situations. Another important aim of learning was to develop an **attitude** of defending physiotherapy knowledge, of knowing the answers of being knowledgeable, able to instruct patients and of appropriate professional behaviour, of conforming.

The **ways** of learning to be a physiotherapist perceived in this pattern were through doing: through carrying out the work. Early in the education professional demonstration of assessment and treatment was valued. Learning continued through imitating experts and aimed at control of the tools of physiotherapy, such as the therapist's own hands or equipment. Appreciated learning experience was work with a patient in practice, or with individuals with no knowledge of the applied skills. Learning continued through the search for good and bad physiotherapy models, with a premise that there is only one way of working. It was important to identify the physiotherapist's correct language, attitude and behaviour. There was a concern to reach theoretical understanding and to integrate theory and practice. Learning sought evidence in the literature to become related to practice, through developing an ability to reason and make decisions, gradually becoming critical of one's own performance with evaluation of effective treatment, while recognising that there was a lack of evidence. One's own hands and exercise equipment such as weights, strings and pulleys were seen as the main **physiotherapy tools**. Learning sought to perform skills by doing. From the beginning of education the learning focus was mastery and control of physiotherapy's tools.

The main role of the teaching staff in the education programme was seen as to serve as authority to transfer knowledge. Expert physiotherapists are seen as **learning partners** as they are able to tell what is false and true, right and wrong and give feedback to correct was recognised. Feedback on performance was appreciated, for students to know that the right things were done correctly and successfully.

The **context** preferred for developing physiotherapy knowledge was considered to be an exclusive physiotherapy setting of treatment plinth and training equipment where theory could be linked to practice. The learning goal was to be able to work alone in exclusive

physiotherapy settings and to become an authority with unique manual physiotherapy skills to cure patients and restore their health.

Teaching staff was viewed as role models and the **individual** subjected to physiotherapy was viewed as a patient needing help, lacking specific knowledge of physiotherapy and not to be burdened with responsibility. Valued **knowledge** in learning was seen as facts and manual skills derived from books and authorities applicable in treatment. **Learning** was seen as a transfer of material from the more knowledgeable to the less.

5.1.2 Solving problems

Learning to solve movement ability problems by educating clients in a rehabilitation setting

The focus within the solving problems pattern was learning to solve client problems of movement ability, such as walking, climbing stairs, rising from a chair and activities of daily living. To solve the physiotherapy problems, **skills** in educating clients to use their limbs and transfer bodies with or without training equipment, were required. Important knowledge was that which fostered understanding of why clients developed movement problems and how they could be helped to retain and maintain movement ability and also learn to discover the nature of limitation. The **knowledge base** was seen to be developed from practice. Knowledge was experiential and generated from clients and colleagues through discovery. The new knowledge generated could then be integrated with practice. The required **abilities** to learn were teaching, listening and motivating, and transforming and adjusting knowledge to the individual client. There was a concern to learn to solve the client's movement problems and to develop an **attitude** to support her or him to use their body to walk, sit, rise, turn or climb stairs.

The **ways** of learning perceived within this pattern were through communication. Learning, at the beginning of education, is aimed to being able to frame and ask questions and to listen to others asking questions. To notice what questions are asked, and when it is appropriate to ask, supported understanding and developing alternative ways of explaining to, and educating clients in movement training. Learning also developed through discussions with tutors, peer students and staff and students in other cohorts. Learning to listen to clients' objectives and to use educational abilities to discuss/negotiate with them when setting treatment objectives was used in practice. Learning from feedback from clients and their relatives on interaction and on information and educational activities was appreciated. Towards the end of education, learning focused on skills of self-appraisal and critical self-evaluation. Movement analysis ability and educational skills were now perceived to be the main **physiotherapy tools** with which to help and support the client to train, and to reach and maintain expected health.

Verbal feedback from peers, tutors and teachers was appreciated, particularly on behaviour and communication skills. The main role of teaching staff in the education programme was seen to be stimulation to think further. Doctors, occupational therapists, nurses and other physiotherapists in a selected team in practice were the main **learning partners**.

The preferred **learning context** was a rehabilitation setting where a small team interacted. Learning was aimed at a physiotherapy role in a rehabilitation context in a hospital or in a client's home, with a view to working in the team, contributing physiotherapy knowledge to solutions of movement ability through educating the client.

Teaching staff were viewed as discussion partners and the **individual** subjected to physiotherapy was viewed as a client interacting with the team and discussing and negotiating different strategies to use in solving the movement problem. Valued **knowledge** in learning was based in educational skills and seen as experiential and derived from practice. **Learning** was seen as a discovery by the learner.

5.1.3 Managing health

Learning to enable individuals to move in an everyday life activity by designing and/or organizing activities for them

The focus within the managing health pattern was learning how to support peoples' independence and to help them to find new ways to move in activities and in a context chosen by themselves; or to help adjust their environments. Significant problems relevant in physiotherapy were defined by the individual person and the aim of physiotherapy was to identify and manage movement problems perceived by the individual person in her/his own situations and settings. Empowering **skills** were learnt through management. Tacit knowledge was valued as much as explicit. The relevant **knowledge base** was perceived to be both formal and informal, integrated into the creation of new knowledge. All forms of knowledge were recognised as supporting the individual's objectives. **Abilities** aspired to were to show empathy, to inspire and to enable individuals to act in their everyday lives. There was a concern to develop an **attitude** of being a resource in enabling people to move in every day life activities. Learning focused on the individual and how to "get into somebody else's world".

The **way** of learning to be a physiotherapist perceived within this pattern was dominated by reflection in and on an individual's activity. Already early in education there was reflection on the successful use of skills such as listening, explaining and motivating, as well as on acquiring body empathy and on the possibilities and limitations of one's own body. Later, reflection together with individuals on the latter's own difficulties was seen as a way of learning to understand them and their need for movement in their own settings. Individual needs can be used to determine alternative ways of using body movements or ways to adjust the setting to support the individual. Reflection on an individual's situation by participating in her/his sociocultural context was seen as essential for identifying and understanding what the individual wished to accomplish. Guidance by organizing, providing and creating opportunities for movement training were some strategies used. The physiotherapist her/himself was seen as the main **physiotherapy tool** and processes of reflection enabled abilities such as interview skills, to establish a relationship, to inspire and support the individual's own resources.

The role of teaching staff in the education programme was to respond to and support attempts at reflection. Development in learning to be a physiotherapist was recognised in

the individual student's ability to reflect on experience from individual persons and, later in the education programme, from observation and reflection of the physiotherapist role in an extended team where it was understood that knowledge is created together. Learning occurred through participating in an extended team of professionals. Together with **learning partners** as individual persons and their significant others and members of different professions, team skills, management skills and skills of behaviour could be developed.

The preferred **context** of learning in this pattern was one where the individual could express and demonstrate his/her movement problems. It could be in the bus outside a persons' house, the path through the nearby woods, the supermarket or the ice-skating rink. The aim was to learn to be a resource and to empower the individual person to move in here or his context. Being one of an extended team was seen to create the best possibilities for enabling the individual to use body movement in her/his everyday world.

Teaching staff were viewed as being one resource in learning in the same way as physiotherapists were viewed in relation to the individuals they meet as professionals. These **individuals** were viewed as persons with an objective to manage or minimize a movement problem and make the most of everyday life despite difficulties to move their bodies. **Knowledge** valued in learning was multidimensional empowering skills derived from everyday activity. **Learning** was seen as creation together with others in everyday life activities.

5.2 STUDY I

Professional socialization: students' expectations about being a physiotherapist

Expectations about being a physiotherapist were described in four different categories ranging from a predominantly view of behaving as a physiotherapist to a holistic view with a concern for communicating with patients and finding ways to help them (Figure 5). The descriptions represent what the students brought to their physiotherapy education as new entrants. They were seen as a hierarchical continuum of perspectives. *Acting professionally* was the least complex perspective and communication the most complex. Acting professionally was achieved through learning how to behave as a physiotherapist, learning facts and keeping up-to-date with knowledge and research. *Instructing* represented a perspective with an interest to learn about the body and how it works, how to fix the patients' mechanical movement problem and how to instruct them about it. *Caring* is a perspective with a concern to learn to work with patients of all ages including the elderly, and in different settings, e.g. with patients in hospital with fractures, athletes in sport clinics and with mentally disabled children in rehabilitation. *Communicating* represented a perspective where the objective was to learn to see the entire person while treating the musculoskeletal system. (Figure 5)

“Acting professionally” involved a predominant concern to look and behave as a physiotherapist. The students focus was on themselves. They expected to learn facts, what was right and wrong and to be knowledgeable, an authority.

“Knowing what you are doing and not asking questions all the time”

“**Instructing**” involved understanding that physiotherapy was centred round knowing how to fix patients movement problems. The physiotherapist was seen as working with movement with the aim of curing.

“... then I go ahead and set up a plan ...practising balance, co-ordination, traction, instructing”

“**Caring**” meant focusing on patients’ needs. The physiotherapist was seen to use mainly her hands and help the patient sort out their problems.

“You palpate the patient...he must trust you, feel safe and when he does, other things from inside may turn up”

“**Communicating**” was about ensuring successful interventions by sharing patients’ own worlds. This could help patients with mental as well as physical problems. The physiotherapist worked in teams to help the patient back to full life.

“getting into someone else’s world”

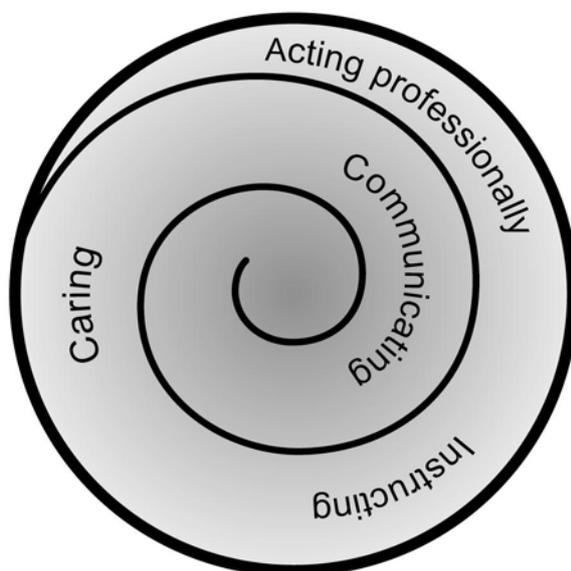


Figure 5. Students’ expectations about being a physiotherapist emerged as a continuum of perspectives.

5.3 STUDY II

Early learning experiences valued by physiotherapy students

Four different and separate themes of valued learning experience during the first year of physiotherapy education were identified and described. The first concerned the experience of *learning from support and feedback*. It expressed the value of having support available in feedback from teaching staff as well as from peers and patients. In the second theme, *learning from others and self* the value of different learning partners was recognised. *Learning from observing in clinical practice settings*, expressed the value of being able to observe what physiotherapists do in ‘a beautiful mix between theory and practice’, how they carry out their work and the role they have. *Learning from participating in clinical contexts* illuminated the value of real-world experience.

“Learning from Support and Feedback”

Students appreciated purposeful organisation of curricula and sufficient time and a kind learning atmosphere to help them learn. They also appreciated receiving feedback on their developing skills.

“Some things are impossible to learn by reading only. It is one thing to read that it (a movement) should be inwards, outwards and back and forth, and it is quite another thing when you stand there and have to do it.”

“Learning from Others and Self”

Students valued being challenged by the teaching staff and also being able to put all kinds of questions. Discussing and reflecting together with others while practising skills was also highly valued.

“...we were assigned to do exercises five minutes a day and not one of us did.”

“Learning from Observing in Clinical Practice Settings”

Students appreciated observing physiotherapy skills, noting strategies used by physiotherapists and observing the settings in which physiotherapy was used. They also observed the role and the language of physiotherapists and how they interacted with other staff.

“...the PT’s (physiotherapist’s) role is wider than I thought at the beginning. I had only seen the physical part, the working with musculoskeletal part.”

“Learning from Participating in a Clinical Context”

Students expressed the difficulty of imagining how patients would act and respond. They needed real patients, real clinicians and real problems to learn.

“going out for a day you get a wider approach – when we are learning we only see one thing and it made me appreciate and try to understand more about different types of treatment available...here I feel like a student, there I felt like a physio.”

5.4 STUDY III

Development pathways in learning to be a physiotherapist

Students’ experiences of learning through term 1-5 in the physiotherapy education programme were described in four development pathways. The pathways represent qualitative different but equal ways of learning physiotherapy. In all pathways it can be noted that theoretical knowledge as well as skills and attitudes related to the profession are learnt but with different focus and in different ways. *Searching evidence* pathway represents a formal way of learning starting with active search for facts and evidence in the literature. The *performing skills* pathway is learning by doing and with a dominating concern for learning how physiotherapy is carried out. A pathway of *communicating with others* represents learning through questioning and discussion with peers, teaching staff, patients/clients and other health care professionals. *Reflection on practice* is a pathway in which self reflection moves to reflection on patient and practice.

“Searching Evidence” Formal knowledge and confirmation in practice is looked for. Later in the programme knowledge which relates to specific patients are paid attention to. Towards the end of the programme it is questioned if published evidence is reflected in practice. Finally there is recognition that there is a lack of evidence to support the practise of the profession.

”If they (the patients) can’t see that we’re setting goals and they’re based on reliable, valid measures then I don’t think they’re going to support our profession.”

“Performing Skills” is learning by doing, often related to performing techniques. At first learning starts by imitating role models. Later positive and negative examples are distinguished in role models. Development continues to an awareness of transfer of knowledge and how to manage performance in different situations and in different settings.

”Then we did passive movements and he (the patient) told us ”A little more sharp”, ”You can do a little more”...He knew exactly what it should feel like and could guide us so that we did the right thing.”

“Communicating with Others” Preferred learning opportunities are talking with other students and teaching staff. Books are not much used and lectures are used to ask questions and listen to others’ questions. Discussing with peers and teachers are important. Psychomotor skills are learnt through talking with others. Verbal feedback is seen to be important. Learning focus is practice as agreed by others.

”Through your peers you get the manual skills right...your thumb pinches too hard...your hand is too cold.”

“Reflecting on Practice” Reflection is an active tool of development. In early semesters focus in this pathway is on reflection on self, own bodies and own performance and later the focus moves towards reflections on interaction with and towards the need of the patient. Finally reflection is used on critical experiences that challenge the assumptions and relevance of the physiotherapy profession.

”The patient said that I had told her not to think of her pain...But how could she stop thinking when I (the physio) kept asking about her pain all the time?...I had not reflected on that and then I realized it was a challenge not to ask her about her pain but try to figure out other ways to assess her and help her.”

5.5 STUDY IV

Physiotherapy students’ professional identity on the edge of working life

Three professional identities of being a physiotherapist, revealed at the time of graduation suggest different learning pathways can lead to different professional identities. Students’ expressed experiences, when leaving the university, were recognised as the *treater*, the *educator* and the *empowerer*. They are qualitatively different regarding professional focus including preferred working context, view of time, understanding of role, view of knowledge and learning and in desire of collaboration with other health care staff and particularly the level of movement at which physiotherapists work (Figure 6).

The Treater, understands the role as using a wide set of physiotherapy tools to treat the patient in a exclusive physiotherapy context

”Ideally want to see acute in two days and ‘cure` in 2-3 weeks.”

The Educator, understands the role as instructing and discussing with the patient as a means to reach health

”Wouldn’t do exercises but noted that he could crawl from w/c to toilet and back without help and push down on taps, lean forward to take paper towel etc.”

The Empowerer”, predominantly understands the role as enabling the patient to reach his/her objectives in his/her own context

“Having your ear to what they are saying to focus in on what he (the patient) wants and what his concerns are”

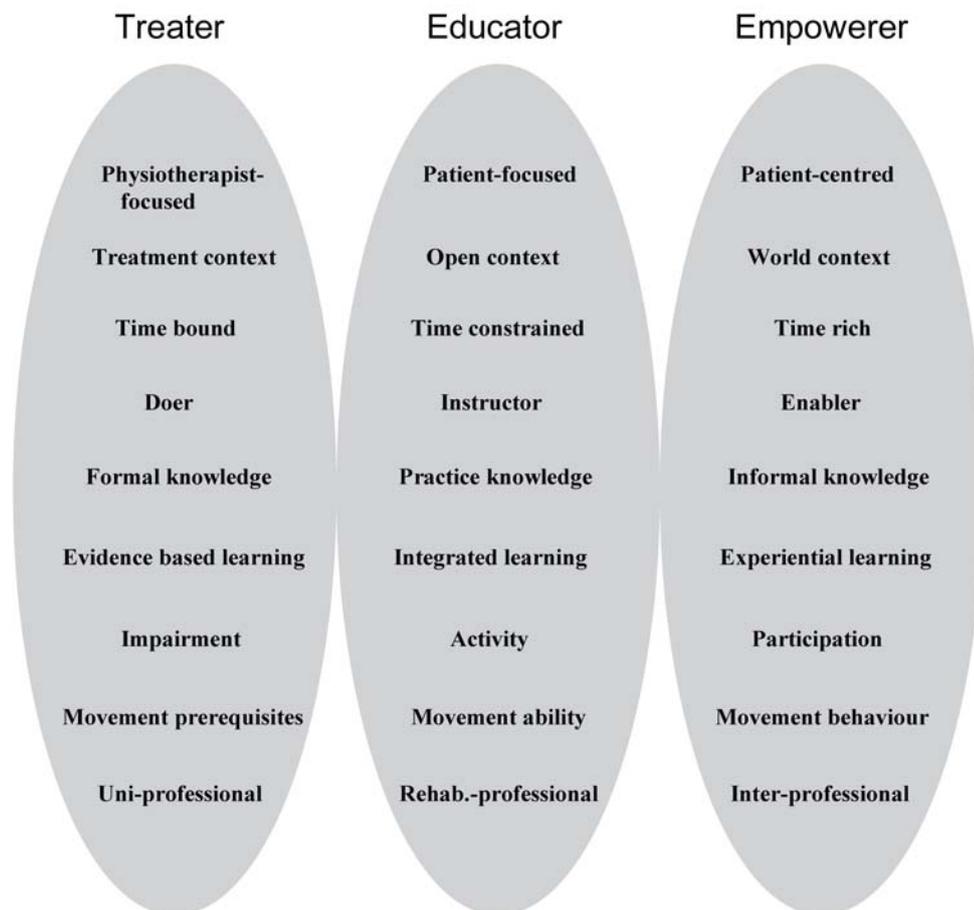


Figure 6. Three different categories of graduating students’ professional identity as a physiotherapist emerged and were described as the *treater*, the *educator* and the *empowerer*. They are qualitatively different in professional focus, preferred working context, view of time, understanding of role, view of knowledge and learning, in level of collaboration with other health care staff and in level of human movement at which physiotherapists work.

6 DISCUSSION

6.1 FROM A COGNITIVE TO A CULTURAL VIEW OF LEARNING

The present work is the first study to show learning patterns identified from students' perspectives over a three year physiotherapy education programme. The findings illuminate three different patterns ranging from a cognitive view of learning to a cultural one. The focus of learning, the ways of learning, learning partners and context were important in all the patterns but in different ways. Students' experience of learning can be defined as a change in ways of participating in physiotherapy activity. Learning within the cultural view is understood as a co-construction of knowledge together with learning partners in physiotherapy activity. The context, the setting and situation in which the physiotherapy activities take place can be understood as different aspects which influence learning.

In this study the experience of learning was explored from the physiotherapy students' perspective. Students' experience reflected a move from a cognitive to a more cultural view of learning within the profession. The socio-cultural theory of learning viewed as a change in the student-world relationship was reflected in how students talk, what they do and in social artefacts as observed by Säljö (2000). However there is no indication that the changes in health panorama, changes in health care and view of learning have yet been purposefully drawn into physiotherapists' development of a theoretical knowledge base of their own. The lack of an established theoretical framework has been noted earlier (Tyni-Lenné, 1989; Krebs & Harris, 1990; Parry 1992; Richardson , 1993) and is a subject of current debate (Bithell, 2005), suggesting that a theoretical framework embracing the cultural view of learning could close the theory-practice gap and be valuable to students and the profession alike (Higgs & Titchen, 2000). Acknowledgment of the importance of recognising the cultural aspects of physiotherapy could open new doors for physiotherapists, and this could include working in new arenas without using their hands. Physiotherapists working 'without hands' may work by direct means enabling individuals or groups of people to move, or by indirect means enabling people to move in different activities by working politically, in health planning, in designing rehabilitation settings or in companies with sedentary work.

The learning patterns described in this research should not be regarded as mutually exclusive. Instead it is suggested that all patterns of learning are important aspects of learning to be a physiotherapist and may be presented to each individual student for them to use differently in different physiotherapy activities. The patterns can be seen as a smorgasbord of possibilities through which students can adjust and change perspective and acknowledge the dynamic interplay between different ways of learning. There are benefits for physiotherapists in being able to switch more explicitly between patterns of learning in different situations and different settings if the patterns are consciously recognised and articulated. If physiotherapy staff predominantly uses one pattern of learning in their own work it can help to make that pattern transparent to the students.

6.2 LEARNING AS CONTEXT SPECIFIC

The present findings resonate with the view that context plays an important part in learning (Snadden, 2006). Physiotherapy students in this study identified with different development pathways through education and their experience led to different professional identities at

the endpoint of education. If educators recognize the importance of context they may use it purposefully to support students' learning to be physiotherapists. Physiotherapy is an integral part of the health-care system and changing health care needs should be reflected in changes in physiotherapy practice. Physiotherapists can influence health-through-movement in different ways, as witnessed in this student cohort, where students' patterns of learning focused on treating, educating to solve movement problems and empowering clients to move in their chosen activity (metasynthesis study). To work in an exclusive physiotherapy setting suggests other concerns of the physiotherapist than working in the world of the client. Physiotherapy knowledge, skills and attitude have to be interpreted in these new practice settings. Knowledge can be seen not only as what is transferred, but also as discovery and creation when it is transformed between different contexts. If students are to understand how knowledge is transformed to the new situation in the new setting, they need to be guided to recognize their situated experience of different contexts and to understand that this is an expected and purposeful component of the curriculum.

In regard to the profession as a whole, the theory-practice gap has been recognized in physiotherapy (Richardson, 1993) as well as in other professions (Eraut, 1994). The gap could be related particularly to the context in regard to learning. There is a need to recognize practice as the arena where theoretical questions can also be raised and new knowledge generated. Teaching staff can raise more awareness of the ways in which the interplay between knowledge of theory, professional skills and attitudes and the procedures and routines which are learned in health care contexts are integrated into student learning experience. If teaching staff recognizes the emphasis placed upon learning in practice settings by students, they may consider how they can further support the integration of theory and practice. The present informants recognised situated learning as important (Studies II, III and IV). This accords with Wenger, who in 1998 recognised the benefit of situated learning for students to realise that knowledge is created together with clients, other physiotherapists and professionals in extended teams in everyday physiotherapy activity. Situated learning may help physiotherapy students to recognize that all skills are important (Higgs & Titchen, 2000), whether manual, communication, management or team, and all are recognized to be of greater importance in the future.

6.3 RECOMMENDATIONS TO EDUCATION

6.3.1 Patterns of learning

It is hoped that the findings in this study will add to an understanding of how students learn through an education programme, and will assist in informing curricular design which recognises the experience the students bring to their education and the incorporation of all activities therein, whether formal or informal, planned or unplanned. If learning to be a physiotherapist could be understood as changes in participation (Rogoff, 2003), where novice students enter education as apprentices with limited understanding, few if any tools to use and a narrow picture of what professional attitude means in the physiotherapy profession (Study 1), then guidance of their learning of the theoretical base and skills and monitoring the progress of their professional socialisation can help to ensure that these become integrated. All educational activities can be seen to influence students' learning and the professional identities students adopt as they leave the university as professional physiotherapists.

The findings indicate different learning patterns in a cohort of students. Awareness among teaching staff of the variation of learning patterns in any cohort of students at any point in time may help them to acknowledge the learning needs of the individual student and guide their learning. It is further suggested that purposeful monitoring of students could help teaching staff ensure they help students to develop an ability to consciously adopt different perspectives as professionals.

The different patterns of learning identified can be seen to be appropriate according to work with specific patients/clients/persons in specific contexts employing a variety of health-care staff. For example work in acute hospital care will need to be based on a different pattern of learning from that of work in a community setting. In the acute care hospital physiotherapists may treat patients, while in a community setting they may support individuals' self-management. Education can aim purposefully to foster student physiotherapists' views that physiotherapists can take on different roles. The present findings suggest that teaching staff should pay attention to the context in which learning takes place as well as the content and the ways students learn and who they learn together with. It is likely that both teaching staff and future employers will increasingly note the educational outcomes of professional education curricula which are intended to ensure that graduating students are fit to practice (Millar, 2002; Vaughn, 2003).

Performing treatment as a strategy demonstrates using knowledge in treating e.g. restoring the range of movement in a knee, strengthening of a weak muscle or resolving pain in a sore neck. Learning is aimed at becoming a physiotherapist who can treat and explain the movement problem to the patient. Where there is a well-defined injury or limitation, this view of learning strategies for physiotherapy treatment can be purposeful and relevant for the patient. Knowledge is related to the cognitive theory in which knowledge "is conceived as a set of tools stored in memory, carried around by individuals to be taken out to use, the more often and appropriately the better, after which they are stowed away again without change at any time during the process" (Lave 1988 p 24). There is here an understanding that the tools resist change over time and in different settings and can be transferred for use in professional life (Lave, 1988).

Solving problems is a strategy for solving patients' mobility problems which can be appropriate for educating clients with a, maybe, lifelong condition. The learner constructs knowledge of educating skills in a rehabilitation setting with a health-care team. Working in teams suggests a role which requires special skills that allow discussion and debate without losing professional focus (Hall & Weaver, 2001). An analogy to this learning pattern could be 'having a bigger garden to work in'. Learning construction is like tearing down the garden fence and putting it up further out. One is able to achieve more land, new tools, different plants and new ways to work. The new repertoire gives greater freedom and greater readiness to act. Learning within this pathway is still much seen as individual construction (Molander, 1993; Eraut, 1994; Marton & Booth, 1997).

Orientation towards managing health as a strategy may be appropriate in work with people with long-term chronic disease or other movement limitation, but may also facilitate work to be carried out in new contexts within generic health planning or in health-promoting activities for groups in the community. The learner in these situations can be viewed as co-constructing knowledge with others in a physical context. This is in line with concepts of

multidimensional knowledge constructed together with others in an activity where the knowledge is to be used (Lave & Wenger, 1991; Lave, 1993; Säljö, 2000; Rogoff, 1990, 2003). Rogoff (1990 p.19) used the analogy of apprenticeship in learning: "...to focus on how the development of skill involves active learners observing and participating in organized cultural activity with the guidance and challenge of other people".

6.3.2 Influence of context

Learning norms, values and beliefs has long been recognised as an important part of the socialisation process (Vollmer and Mills, 1966) but the intertwined aspects of the learning process have not been made explicit. Present findings indicate that students experience learning the norms, values and beliefs of the physiotherapy profession through role models, reflection and discussions with significant others in different learning situations (Studies II-IV). Similarly to medical students (Radcliffe & Lester, 2003) physiotherapy students look for role models. They are more likely to be found among clinical supervisors than among university educators (Jacobsen, 1980). Physiotherapists, seen as experts in the professional community, have been reported as role models important in students' development (Martin et al., 1993). Awareness by teaching staff of the impact the experience of a professional everyday activity e.g. having a patient walk the stairs or training to walk with crutches, in a certain context together with clients/patients and other health care staff, can have on a student's learning is central to an understanding of how that activity illuminates physiotherapy's culture and communication. The activity gives students the possibility to see what physiotherapists do and do not do, and what attitudes they show towards a patient and other health care staff. Further, the student listens to how they talk, what they say, what questions they ask and how they discuss. The important finding of the present research supports the notion that students learn professional attitudes in situated physiotherapy activities. Professional attitudes of teaching staff in the clinic or university setting reflect a perspective of a physiotherapy role, ways to interact with patients/clients/persons and ways to communicate with other health-care staff. If teaching staff monitor the socialisation process purposefully this can further support students in developing their professional attitude and help them link theory and practice. Learning physiotherapy norms, beliefs and values in situated activities suggests a need for the students to spend time with teaching staff in everyday physiotherapy activities and to have mentor time where they may discuss questions related to professional attitudes, and through which they can mirror their own developing attitude.

6.3.3 Curricula

The present findings of how and what students learn about their profession point to ways in which teaching staff can turn the knowledge gained into live curricula which acknowledge the learning in all students' experience. A first step will be for teaching staff, both in the university and in the clinic to recognise students' different experience of learning. To develop more sociocultural strategies in curricula, well-defined goals, improvised learning practices, individual commitment, workplace efforts, professional discourse, behaviour and identity, and opportunities to transform social practice, are needed (Swanwick, 2005). Strong and well-formulated learning goals in courses, recognition of students as learners and practitioners as teachers in the workplace have been put forward (ibid). Practice may seek to include activities in which students work alongside physiotherapists not only in assessing, training and enabling movement but also

participating in physiotherapy group activity such as planning or evaluating practice, tackling a challenging task such as planning an educational activity for colleagues, and discussions of a difficult movement problem in a patient.

Development of physiotherapy curricula seeks to prepare professionals for future health care and research. If one of the described patterns of learning predominates, the physiotherapy profession may not fully present a relevant profile of best practice in all health-care settings. This may hinder development of physiotherapy knowledge about movement in relation to health. The patterns described have different and contrasting ontological and epistemological positions. The patterns represent different world views: different views of how physiotherapists influence health through movement and different views of the involvement of the patient/client/person. The knowledge used and the sources of knowledge are described differently and in the ways through which the knowledge is learnt. To be able to continue to offer best practice in a world of changing health care and changing health problems, these findings suggest, the learning patterns described could be viewed as a repertoire for each practitioner for use in different settings and situations as necessary (metasynthesis study). The learning patterns described in the present work could be related to evidence-based, reflective and reflexive practice as described by Blair and Robertson (2005). Evidence based practice is a strategy to find objective, value-free, stable knowledge which resonates with the learning pattern *performing treatment*. Reflection is described as a strategy for dealing with complex practice situations. This resonates with the learning pattern *solving problems*, while reflexive practice is used to compare and contradict personal knowledge to abstract thinking and theory which resonates with the *managing health* pattern.

6.3.4 A new learning cycle

The findings suggest a new learning cycle as an alternative to Kolb's learning cycle (Kolb, 1984) which neglects the social context. A sociocultural learning cycle developed by Engestrom (1998) introduced by Bleakeley (2002) and further discussed by Bleakely, (2006) may have a closer relevance as an appropriate model of learning. The cycle starts in "context' leading to 'cognition' leading to 'contradiction' leading to 'reformulation and widening of the context'" (Bleakeley, 2002 p.14). Knowledge within a working group in a practice setting, a context, may be challenged by focusing on contradictions initiated by new members of the group, new reading or by reflective activities. By focusing on the contradictions, possibilities for constructing new knowledge in the working group arise. This may be considered as gaining a new context with new knowledge, new tools and new ways to work for the group, which changes participation for the group members.

6.4 METHODOLOGICAL CONSIDERATIONS

6.4.1 Concepts in qualitative research

Some researchers claim that the established criteria for scientific rigour in quantitative research can not be applied to qualitative studies. Others suggest alternative criteria for qualitative research (Hamberg et al., 1994; Malterud, 2001). In a review article on phenomenographic research Åkerlind (2002) argues that qualitative researchers are still expected to address issues of validity, reliability and generalisability even if these concepts derive from a quantitative approach. In the world of medicine it could be important that

qualitative researchers relate to the concepts used in quantitative tradition to maintain credibility and enhance and make it possible to discuss results between researchers from different traditions and reach an understanding that “words count” (Johnson & Waterfield, 2004). Concepts, derived from quantitative research, have to be translated, explained and reframed in the qualitative tradition. In qualitative research credibility replaces internal validity, transferability replaces external validity (generalisability), dependability replaces reliability and confirmability replaces objectivity, which are terms appropriate to the four aspects of trustworthiness, namely truth value, applicability, consistency and neutrality (Guba, 1981).

6.4.2 Trustworthiness

Trustworthiness in this study was established in a number of ways. Actions leading to credibility were the long engagement, more than one researcher and the establishment of a structural coherence of findings in relation to theories of learning. Differences in language between researchers, at first regarded as an obstacle, can be regarded as an advantage, as the validation of the study findings increased through on-going discussions of terms and concepts and negotiation to ensure full understanding and agreement of the outcome space. Frequent meetings, an exchange of scripts within and across countries ensured trustworthiness in early analysis. Identification of diverse and negative cases helped to refine descriptions. To collect and develop thick descriptions in a research group of several researchers is important for reaching dependable data and stable findings. To have the findings investigator-free or neutral is a matter of reflexivity, of recurrent thinking of the effect of the researcher which has been discussed thoroughly in the research group. Whether the findings of this research can transfer or translate to further physiotherapy-related and other health professional contexts relies on the judgement of the reader who may or may not be able to see a resonance with their own context.

6.4.3 Respondents

This research aimed at contributing to understanding of the phenomenon of learning to be a physiotherapist. It has striven to offer descriptions corresponding to the experience of the respondents. Following individual students through education, although a possibly interesting study, was not the concern of this initial exploratory study. The present cohort of twenty one students was recruited on the assumption of its being a number which could give full and rich descriptions of the phenomenon and a saturation of ideas. The longitudinal character, with interviews throughout the education was a continuous process of coming back to the same cohort of students for more data. It supported the development of descriptions that could be structured and related to learning theory. A saturation of findings was evidently reached in relation to an information redundancy with no further concept being generated (Lincoln & Guba, 1985) and in relation to theoretical saturation (Strauss & Corbin, 1990). The sample size in this study was judged according to its aim and the longitudinal character, and the collected information sufficed to capture students’ experience of learning, yielding rich information with a manageable amount of data, as proposed by Sandelowski (1995).

6.4.4 Metasynthesis study

Through a metasynthesis study, small qualitative studies may be found to have a greater impact on practice, to generate greater possibilities of resonance or generalisability to other

settings and to render a deeper theoretical understanding of studies in the same field (Estabrooks, 1994). Synthesis of qualitative research is still at an early stage of development, but has become increasingly appropriate as qualitative research has matured and gained a place in the research community (Harden & Thomas, 2005). Criteria for studies with similar themes and population exist that have a similar research approach, well grounded in data (Estabrooks, 1994). The argument for a metasynthesis study in the present work was the desire to gain a higher level of theoretical understanding in relation to current theories of learning, greater understanding of the phenomenon of learning and an opportunity to construct arguments (McCormick et al., 2003) and gain confidence in argument (Malterud, 2005) to support educational change.

6.5 FUTURE RESEARCH

Several suggestions for future studies are based on the findings of this study of learning to be a physiotherapist.

It would be interesting to explore how the students in this research are influenced from situated learning experience (Wenger, 1988) at work as new graduates by interviewing them after 3-5 years in the profession. From a sociocultural learning perspective, context is important in learning together with patients and other staff. After one or two years in the profession, it is suggested, the physiotherapist may have developed a new understanding of the profession. Understanding their continuing learning in everyday physiotherapy and how this relates to their experience of the profession on graduation may be of interest to teaching staff, and may further support curriculum development.

Learning is viewed as an activity carried out together with others. It may be clients/patients, other physiotherapists or other health care staff in the physiotherapy setting and situation. Teaching staff are important not only in focusing on the content of physiotherapy but also in guiding how it is learnt and how it is carried out. Therefore it would be of interest to explore teaching staffs' understanding of what they believe to be valuable to learning in an undergraduate physiotherapy programme, to be able to develop relevant learning goals (Higgs et al., 2004).

Further studies of how learning theories can be integrated with physiotherapy curricula are needed. Lave & Wenger, (1991) pointed out that learning a profession can be seen as an apprenticeship model where the student goes from the periphery to the centre of the profession. This view urges teaching staff to move from a teachers' perspective to a students' perspective, from a didactic model of education to a learning one if they believe that knowledge is developed together with others (patient/client, peers, other health care staff) in every day physiotherapy activity guided by teaching staff in a specific setting. The learning situation is also influenced by the learner's prior learning experience, cultural tradition and personal history. How students with specific experience adapt to learning may be interesting to explore and may also help curriculum development.

6.6 CONCLUSIONS AND IMPLICATIONS

6.6.1 Conclusions from the metasynthesis study

- Patterns of learning identified over a physiotherapy education programme show a variety in learning focus and in ways of learning
- Differences in patterns of learning can be related to different views of knowledge and learning
- Experience of learning is influenced by the context in which learning occurs
- Experience of learning is influenced by learning partners participating in the physiotherapy activity

6.6.2 Conclusions from studies I-IV

- Study I: New entrants to physiotherapy education programme had different expectations about being a physiotherapist, which may influence their learning experience
- Study II: In the first year of study, students perceived significant learning from experience that involved them in interaction, in observation and in hands-on practice in real health-care and rehabilitation contexts
- Study III: Discrete development pathways among students were identified throughout an education programme where each showed development towards competence and ability for practice as a physiotherapist, and potential for a range of different orientations towards the profession on graduating
- Study IV: There was diversity in the ways graduating students identified with their profession and a variation of concepts about being a professional. These may be of relevance to educators, future employers and to the development of the profession over time

6.6.3 Implications for physiotherapy education

- An awareness of different learning patterns that students may adopt throughout the programme can inform curriculum development to consider the relevance of the differences
- Teaching staff should pay attention to the ways students learn, to whom they learn together with and to the context in which learning activity takes place, as well as to the content
- Students can be purposefully exposed to different patterns of learning to support their use of appropriate strategies in practice
- Different forms of knowledge can be made explicit in the syllabus to emphasize the integrated knowledge base of physiotherapy
- Guided participation in practice can be further enhanced by increasing involvement of all teaching staff in practice settings
- Different physiotherapy contexts can be used purposefully in education to influence learning
- There is a need to translate findings from the present study into the live curriculum by creating ongoing learning and assessment strategies that can guide everyday education

7 ACKNOWLEDGEMENT

I wish to express my sincere and warm gratitude to all those who have supported me and made my thesis possible. The present work has been a true co-construction of knowledge. It started many years ago, has developed over time and now led to the present work. Hopefully I have learnt and know things a bit better through this work. In particular I thank:

All physiotherapy students in University of East Anglia and Karolinska Institutet, who gave their time and shared their experience with us through their education programme. There had not been a thesis without you!

Barbara Richardson my main supervisor, co-author and friend for initiating the project and for all your work together with me. You have shared your professional and scientific knowledge and taken a very active part in my thesis towards this doctoral degree. Learning together with you has been a privilege. You have guided much of my learning which made me grow professionally as well as personally.

Margareta Engardt, my co-supervisor, co-author and friend for initiating my doctoral studies, staying with me on the scientific journey and sharing all your knowledge. The generous, lively and innovative discussions and your never failing support guided me through the research process and helped me see things I never thought I would. Learning together with you gave me the courage to do this work and made me grow.

Christina Stenström, my co-supervisor for generously and bravely welcoming me to your research group, sharing your knowledge and being there for clear, valuable and wise second opinions, which made me see new alternatives and helped the work to develop further.

Fiona Poland (sociologist) and **Liz Garnham** (occupational therapist), my co-authors and new learning partners for being part of our multicultural team and for endless and good discussions about learning experience with lots of good spirit and laughter.

Cathrin Aitman, our master student and co-author for valuable work in our first study.

Karin Harms-Ringdahl, PT, Professor, head of the Division of Physiotherapy at the Department of Neurobiology, Care Sciences and Society for encouragement, belief in my work, financial as well as personal support and **Lena Nilsson-Wikmar**, PT, assistant head of the Division of Physiotherapy for friendship and support in the work with my thesis and for covering much of my regular work.

Elisabeth Olsson, PT, Professor and former head of the Department of Physiotherapy for encouragement and support and for all interesting discussions in our work together over the years.

The qualitative interest group for being my learning partners in all inspiring and valuable discussions and for your support in reviewing and discussing my work.

Especially I want to thank **Gabriele Biguet**, the leader of the group and my unofficial supervisor for your involvement and for giving me many and very valuable comments in reviewing my work.

The ‘yellow research group’ at the Division of Physiotherapy with Christina Stenström as the leader for generously sharing your interesting and well working group activities with me and for inspiring and valuable discussions.

My dear, dear colleagues and old friends at the Division of Physiotherapy. With many of you I have been working for very long. With you I have shared work as well as personal experience and I have got so much from you over the years. Special thank for sharing work and life experience in early morning discussions Eva Mattsson, in mid day discussions Kerstin Bergenholtz, Kerstin Thornberg and for late afternoon discussions Kerstin Eliasson. Thank you also for good work together over the years Janne Johansson, Maria Hagströmer, Anki Sandberg, Christina Andersson, Britt Elfving, Gabriele Biguet, Carina Boström, Kerstin Eliasson, Annica Wohlin Wottrich, Ann-Marie Thorsén and Yvonne Kahlin in the ”course-leader” group. All valuable discussions about educations have given me many thoughts and made me reflect in and on learning, which was part of the base for the present work.

All teaching staff, university lecturers as well as adjunct clinical teachers (AKOR) and clinical supervisors working with the physiotherapy students contributing to good discussions and many new ideas about learning.

All other colleagues in KI supporting health in different ways and engaged in education for all good discussions on education and for your support and interest in my work.

Anna Lindhoff for always being a good support but especially for supporting my doctoral studies by preparing and doing a lot of work for me during the present work.

Vanja Landin and Inger Tjergefors for all valuable and good administrative support.

Tim Crosfield for valuable scrutiny of the English language and good discussions.

My family Tobias, Anna and Sigfrid, Sara, Stefan and Sofia and Henrik for your love, encouragement and belief in me, doing this thesis. You are my grown up children and I love you all! You mean very much to me! Special thanks to Henrik for designing my book.

My father Ernst for being my true support throughout my life.

Ingrid and Pelle for being my extended family always supportive, encouraging and having room for me at the dinner table.

Financial support for the work reported in this thesis is gratefully acknowledged from the Physiotherapy Research Foundation, the UK and the Board of Education Karolinska Institutet, Stockholm, Sweden.

8 REFERENCES

- Abrandt, M. (1997) Learning Physiotherapy: The impact of formal education and professional experience. *Linköping studies in education and psychology* (Linköping, Linköping University).
- Anell, A. & Hjalte, F. (2004) Resurser i svensk hälso- och sjukvård: en jämförelse med Danmark, Frankrike, Norge, Storbritannien, Tyskland och USA. *IHE e-rapport 2004:4* (Lund, Institutet för Hälso- och sjukvårdsekonomi).
- el Ansari, W., Russel, J., Spence, W., Ryder, E. & Chambers, C. (2003) New skills for a new age: leading the introduction of public health concepts in healthcare curricula, *Public Health*, 117, pp. 77-87.
- Askling, B. (1987) Vårdutbildningar i förändring: slutrapport från UHÄ:s uppföljning av Vård 77-reformen. in: UHÄ (Ed) (Stockholm, Universitets- och högskoleämbetet). (in Swedish)
- Astin, F., Closs, S. & Lascelles, M. (2005) A 21st Century approach to chronic disease management in the United Kingdom: implications for nurse education, *Contemporary Nurse*, 20, pp. 201-211.
- Barr, H. (1998) Competent to collaborate: towards a competency-based model for inter professional education, *Journal of Inter Professional Care*, 12, pp. 181-187.
- Bellner, A-L. (1999) Senses of responsibility, *Scandinavian Journal of Caring Sciences*, 13, pp. 55-62.
- Bithell, C. (2005) Editorial - Developing theory in a practice profession, *Physiotherapy Research International*, 10, pp. iii-v.
- Blair, S.E. & Robertson, L.J. (2005) Hard complexities - soft complexities: an exploration of philosophical positions related to evidence in occupational therapy, *British Journal of Occupational Therapy*, 68, pp. 269-276.
- Bleakley, A. (2002) Pre-registration house officers and ward-based learning: a 'new apprenticeship' model, *Medical Education*, 36, pp. 9-15.
- Bleakley, A. (2006) Broadening conceptions of learning in medical education: the message from teamworking, *Medical Education*, 40, pp. 150-157.
- Bologna (1999) Bologna declaration in: European University Association (Ed) (http://www.eua/en/policy_bologna.aspx).
- Breslow, L. (2006) Health measurement in the third era of health, *American Journal of Public Health*, 96, pp. 17-19.
- Broberg, C. (1993) Om teori- och begreppsutveckling av sjukgymnastik i ett historiskt perspektiv, *Sjukgymnasten, Vetenskapligt Supplement*, 1, pp. 4-18. (in Swedish)
- Brown, G.T. & Greenwood, J. (1999) Occupational therapy and physiotherapy: similar but separate, *British Journal of Occupational Therapy*, 62, pp. 163-169.
- Brundtland, G.H. (1999) Interagency consultation on disability. *WHO* (www.who.int/director-general/speech)

- Clarke, P.G. (1997) Values in health care; professional socialisation implications for geriatric education in interdisciplinary teamwork, *The Gerontologist*, 37, pp. 441-451.
- Dahlgren, L.O. & Fallsberg, M. (1991) Phenomenography as a qualitative approach in social pharmacy research, *Journal of Social and Administrative Pharmacy*, 8, pp. 150-156.
- dall'Alba, G. (2002) Understanding medical practice: different outcomes of a pre medical program, *Advances in Health Sciences Education*, 7, pp. 163-177.
- Department of Health, (2000) *The NHS Plan* (London: HSMO).
- Department of Health, (2001) *Meeting the Challenge*. (London: HSMO).
- Department of Health, (2005) *Supporting people with long term conditions: An NHS and social care model to support local innovation an integration*, (London: COI).
- Edwards, I., Jones, M., Higgs, J. & Jensen, G. (2004) What is collaborative reasoning?, *Advances in Physiotherapy*, 6, pp. 70-83.
- Engestrom, Y. & Middleton, D. (1998) *Cognition and communication at work* (Cambridge, Cambridge University Press).
- Eraut, M. (1994) *Developing professional knowledge and competence* (London, Falmer Press).
- Estabrooks, C., Field, P.A. & Morse, J.M. (1994) Aggregating qualitative findings: an approach to theory development, *Qualitative Health Research*, 4, pp. 503-511.
- Finfgeld, D. (2003) Metasynthesis: The state of the art - so far, *Qualitative Health Research*, 13, pp. 893-904.
- Guba, E. (1981) Criteria for assessing the trustworthiness of naturalistic inquiries, *ERIC/ECTJ Annual Review Paper*, 29, pp. 75-91.
- Haglund, B. & Rosén, M. (2001) Public health in the future, *Scandinavian Journal of Public Health*, 29, pp. 231-239.
- Hall, P. & Weaver, L. (2001) Interdisciplinary education and teamwork: a long and winding road, *Medical Education*, 35, pp. 867-875.
- Hamberg, K., Johansson, E., Lindgren, G. & Westman, G. (1994) Scientific rigour in qualitative research - examples from a study of women's health in family practice, *Family Practice*, 11, pp. 176-181.
- Harden, A. & Thomas, J. (2005) Methodological issues in combining diverse study types in systematic reviews, *International Journal of Social Research Methodology*, 8, pp. 257-271.
- Health Professions Council (2003) *Standards of professional competence for physiotherapists* (London, Health Professions Council).
- Higgs, J., Richardson, B. & Abrandt, M. (Eds.) (2004) *Developing Practice Knowledge for Health professionals* (London, Butterworth-Heinemann).
- Higgs, J. & Titchen, A. (1995) The nature, generation and verification of knowledge, *Physiotherapy*, 81, pp. 521-530.

- Higgs, J. & Titchen, A. (Eds.) (2000) *Propositional, professional and personal knowledge in clinical reasoning* (Oxford, Butterworth-Heinemann).
- Higgs, J., Titchen, A. & Neville, V. (Eds.) (2001) *Professional practice and knowledge* (Oxford, Butterworth-Heinemann).
- Hislop, H. (1975) The not so impossible dream, *Physical Therapy*, 55, pp. 1069-1081.
- Howe, A., Billingham, K. & Walters, C. (2002) Helping tomorrow's doctors to gain a population health perspective- good news for community stakeholders, *Medical Education*, 36, pp. 325-333.
- Howkins, E.J. & Ewens, A. (1999) How students experience professional socialisation, *International Journal of Nursing Studies*, 36, pp. 411-449.
- Jones, R., Higgs, R., De Angelis, C. & Prideaux, D. (2001) Changing face of medical curricula. *The Lancet*, 357, pp. 699-703
- Jacobsen, B.F. (1980) Role-model concepts before and after the formal professional socialisation period, *Physical Therapy*, 60, pp. 188-193.
- Johnson, R. & Waterfield, J. (2004) Making words count: the value of qualitative research, *Physiotherapy Research International*, 9, pp. 121-131.
- Karolinska Institutet (1993) Degree in physiotherapy. Study programme. Syllabus in: Karolinska Institutet (Ed) (Stockholm, Physiotherapy Department). (in Swedish)
- Kolb, D. (1984) *Experiential Learning* (Englewood Cliffs, New Jersey, Prentice Hall).
- Krebs, D. & Harris, S. (1990) Elements of theory presentations in physical therapy, *Physiotherapy Theory and Practice*, 6, pp. 57-63.
- Kvale, S. (1996) *Inter Views - an introduction to qualitative research interviews* (Thousand Oaks London, New Delhi, Sage Publications).
- Kungliga Gymnastiska Centralinstitutet (1988) *Festskrift vid GCI-GIH:s 175-årsjubileum* (Stockholm, Nordstedts). (in Swedish)
- Lave, J. (1993) The practice of learning. in: S. Chaiklin, J. Lave (Eds) *Understanding practice* (Cambridge, Cambridge University press)
- Lave, J. (1998) *Cognition in Practice. Mind, mathematics and culture in everyday life* (Cambridge, New York, Cambridge University Press).
- Lave, J. & Wenger, E. (1991) *Situated learning. Legitimate peripheral participation*. (Cambridge, Cambridge University Press).
- Lincoln, Y.S. & Guba, E. (1985) *Naturalistic Inquiry* (Newbury Park, CA, Sage).
- Ling, P.H. (1840) *Gymnastikens Allmänna Grunder* (Uppsala, Leffler & Sebell). (in Swedish)
- Lopopolo, R.B. (2001) Development of the Professional Role Behaviors Survey (PROBES), *Physical Therapy*, 81, pp. 1317-1327.
- Lundblad, K. (1993) Sjukgymnastikens ursprung och fäste, in: K. Lundblad, B. Johnsson & E. Holmström (Eds) *Sjukgymnastik i historisk belysning* (Lund, Studentlitteratur). (in Swedish)

- Malterud, K. (2001) The art and science of clinical knowledge: evidence beyond measures and numbers, *The Lancet*, 358, pp. 397-400.
- Malterud, K. (2005) Humiliation instead of care? *The Lancet*, 366, pp. 385-386.
- Martin, C., Sjösten, A. & Shepard, K. (1993) The professional development of expert clinicians in orthopedic and neurological practice, *Sjukgymnasten, Vetenskapligt Supplement*, 2, pp. 12-21.
- Marton, F. (1981) Phenomenography: describing conceptions of the world around us, *Instructional Science*, 10, pp. 177-200.
- Marton, F. & Booth, S. (1997) *Learning and awareness* (Mahwah, New Jersey, Erlbaum Associates).
- Marton, F., Dahlgren, L.O., Svensson, L. & Säljö, R. (1977) *Inläring och omvärldsuppfattning* (Lund, Studentlitteratur). (in Swedish)
- Marton, F., Runesson, U. & Tsui, A.B. (2004) The space of learning, in: M. Ference & A.B. Tsui (Eds) *Classroom discourse and the space of learning* (Mahwah, New Jersey, Lawrence Erlbaum).
- Maudsley, G. & Strivens, J. (2000) Promoting professional knowledge, experiential learning and critical thinking for medical students, *Medical Education*, 34, pp. 535-544.
- McCormick, J., Rodney, P. & Varcoe, C. (2003) Reinterpretations across studies: an approach to meta-analysis, *Qualitative Health Research*, 13, pp. 933-944.
- McKenna, K., Scholtes, A-A., Flemming, J. & Gilbert, J. (2001) The journey through an undergraduate occupational therapy course: does it change students' attitudes, perceptions and career plans?, *Australian Occupational Therapy Journal*, 48, pp. 157-169.
- Merriam, S.B. (1988) *Case study research in education. A qualitative approach* (San Fransisco, Jossey-Bass Publishers).
- Millar, B. (2002) Have you got what it takes? *The Essential Handbook for Qualifying Therapists* (London, EWMap Health Care Ltd.).
- Molander, B. (1996) *Kunskap i handling* (Göteborg, Daidalos). (in Swedish)
- Morrison J. (2006) Editorial: Learning in teaching hospitals and the community: time to get the balance right, *Medical Education*, 40, p. 92.
- Ottosson, A. (2005) Sjukgymnasten - Var tog han vägen? (The physiotherapist - where did he go?) En undersökning av sjukgymnastyrkets maskulinisering och avmaskulinisering 1813-1934 *Department of history* (Göteborg, Göteborg University). (in Swedish)
- Parry, A. (1992) Talking to ourselves, *Physiotherapy*, 78, pp. 887.
- Ponzer, S., Hylin, U., Kusoffsky, A., Lauffs, M., Lonka, K., Mattiasson, A-C. & Nordström, G. (2004) Interprofessional training in the context of clinical practice: goals and students' perceptions on clinical education wards, *Medical Education*, 38, pp. 727-736.
- Radcliffe, C. & Lester, H. (2003) Perceived stress during undergraduate medical training: a qualitative study, *Medical Education*, 37, pp. 32-38.

- Regeringen (2004) *Ny värld - ny högskola* Government document, Prop 2004/05:162. (in Swedish)
- Richardson, B. (1993) Practice, research and evaluation - what is the link?, *Physiotherapy*, 79, pp. 317-322.
- Richardson, B. (1997) A study of student physiotherapists' understanding of their profession, *Nordisk Fysioterapi*, 1, pp. 34-39.
- Richardson, B. (1999) Professional development: socialisation and professionalisation, *Physiotherapy*, 85, pp. 461-471.
- Rogers, C. (1969) *Freedom to learn: a view of what education might become* (Columbus, Ohio, Merrill, cop.)
- Rogoff, B. (1990) *Apprenticeship in thinking. Cognitive development in social context* (New York, Oxford University Press).
- Rogoff, B. (2003) *The cultural nature of human development* (Oxford, Oxford University Press).
- Sandelovski, M. (1995) Sample size in qualitative research, *Research in Nursing & Health*, 18, pp. 179-183.
- Ryle, G., (1949) *The concept of mind* (Hammondsworth, UK, Penguin Books Ltd.)
- Sandelowski, M. & Barosso, J. (2003) Classifying the findings in qualitative studies, *Qualitative Health Research*, 13, pp. 905-923.
- Sjöström, B. & Dahlgren, L.O. (2002) Applying phenomenography in nursing research, *Journal of Advanced Nursing*, 40, pp. 339-345.
- Snadden, D. (2006) Clinical education: context is everything, *Medical Education*, 40, pp. 97-98.
- Socialstyrelsen (1982) Hälso- och sjukvårdslag, in K. Wilow (Ed) *Författningshandbok för personal inom hälso- och sjukvården*, (Stockholm, Liber)
- Socialstyrelsen (2004) *Nationell handlingsplan för hälso- och sjukvården* in: Swedish National Board of Health and Welfare (Ed) ISBN 91-7201-879-8. (in Swedish)
- Stappaerts, K. (1996) The European network of physiotherapy in higher education (ENPHE). News. *Charter of the European Network of Physiotherapy in Higher Education* (Leuven, University of Leuven).
- Statens offentliga utredningar (2001) *Tillskapande av Familjemedicinska Institutet* in: Ministry of Health and Social Affairs (Ed) (Stockholm, Stockholm: Fritzes). (in Swedish)
- Strauss, A. & Corbin, J. (1990) *Basics of qualitative research: grounded theory procedures and techniques* (Newbury Park, CA, Sage).
- Swanwick, T. (2005) Informal learning in postgraduate medical education: from cognitivism to 'culturism', *Medical Education*, 39, pp. 859-865.
- Swedish Association of Registered Physiotherapists (LSR) (Legitimerade Sjukgymnasters Riksförbund) (1998) Description of physiotherapy, and physiotherapy as a field of practice, *Sjukgymnasten*, 1 p. 32.

- Säljö, R. (2000) *Lärande i praktiken. Ett sociokulturellt perspektiv. (Learning in practice)* (Stockholm, Prisma förlag AB). (in Swedish)
- Tyni-Lenné, R. (1983) Sjukgymnastik-fysioterapiprocessen (Physiotherapy process) *Sjukgymnasten*, 14, pp. 17-20. (in Swedish)
- Tyni-Lenné, R. (1988) Sjukgymnastikens kunskapsområde (The scope of physiotherapy knowledge), in C. Broberg, I. Westman Kumlin, C. Schön-Olsson *Vetenskaplig utveckling av sjukgymnastik*. Internordiskt symposium. Göteborg: Göteborgs universitet, FoU Rapport 1988:1. (in Swedish)
- Tyni-Lenné, R. (1989) To identify the physiotherapy paradigm: a challenge for the future, *Physiotherapy Practice*, 5, pp. 169-170.
- Wahlström, R., Dahlgren, L.O., Thomson, G., Vinod, D. & Beerman, B. (1997) Changing primary care doctors' conceptions - a qualitative approach to evaluating an intervention, *Advances in Health Sciences Education*, 2, pp. 221-236.
- Vaughn, B. (2003) Editorial: Health professional roles fit for practice: a new way of working, *International Journal of Therapy and Rehabilitation*, 10, pp. 298.
- Wenger, E. (1998) *Communities of practice. Learning, meaning, and identity* (Cambridge, Cambridge University Press).
- Whiteford, G. & Wright St.-Clair, V. (2002) Being prepared for diversity in practice: occupational therapy students' perceptions of valuable intercultural learning experiences, *British Journal of Occupational Therapy*, 65, pp. 129-137.
- World Confederation of Physical Therapy (WCPT), (1999) *Declarations of principles and positions statements*. (<http://www.wcpt.org/common/docs/WCPT/Policies.pdf>)
- World Health Organisation (WHO) (1980) *International Classification of Impairments, Disabilities and Handicaps (ICIDH)* (Geneva, World Health Organisation).
- World Health Organisation (WHO) (2001) *International Classification of Functioning, Disability and Health (ICF)* (Geneva, World Health Organisation).
- Wollmer, H.M. & Mills, D.L. (1966) *Professionalisation* (Englewood Cliffs, New Jersey, Prentice Hall).
- Åkerlind, G. (2002) Principles and practice in phenomenographic research, *International Symposium on current issues in phenomenography* (Canberra, Australia).
- Öhman, A. (2001) Profession on the move. Changing conditions and gendered development in physiotherapy. *Department of Public Health and Clinical Medicine* (Umeå, Umeå University).