JYU DISSERTATIONS 69

Merja Kurunsaari

Perspectives on Physiotherapy Students' Professional Competence Development during Their Education

UNIVERSITY OF JYVÄSKYLÄ
FACULTY OF SPORT AND
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ABSTRACT

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The aim of this dissertation was to investigate, from different perspectives, how physiotherapy students understand and experience their competence and its development during their education. The research focused on the whole study path of students (n=35) from the very beginning of their studies to their graduation. The data, essays and open interviews, were analysed using phenomenographic analysis and narrative analysis approaches. The purpose was to identify the various ways in which beginning physiotherapy students understand the conceptions of skill, to describe graduating students' experiences of reflective writing as a tool for learning, to identify students' conceptions of their competence at the end of their education, and to examine students' professional competence development during their physiotherapy education.

The findings showed that, in the early stage of their education, the students had different conceptions of skill varying from seeing it as a talent to regarding it as a competence requiring collaboration. The students varied in their views regarding reflective writing as a requirement in their education, ranging from seeing it as a useless task to considering it to be a useful tool for deepening their understanding or for self-reflection or professional development. Graduating students' conceptions of their competence varied. While some of them understood competence as mastering core skills, others saw it as understanding the theoretical basis of physiotherapy, or having a holistic view of physiotherapy, or engaging in and developing multi-professional collaboration. Finally, the narrative stories were used to gather and assess the most common types of professional development and turning points along the students' educational path and professional development. Both empirically and theoretically grounded developmental themes (emotions, reflection, context, cultural awareness), emerged when exploring the findings of the four studies comprising this dissertation. The research results cast light on and contribute to a deeper understanding regarding students' competences, competence levels and professional development. It suggests a need to take individual aims into account in educational planning. The results are useful in developing higher education at least in physiotherapy.

Keywords: physiotherapy students, physiotherapy education, professional competence in higher education, professional development, qualitative research

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TIIVISTELMÄ (FINNISH ABSTRACT)

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Väitöskirjan tarkoituksena oli tutkia eri näkökulmista, miten fysioterapeuttiopiskelijat ymmärtävät ja kokevat omat taitonsa, osaamisensa ja niiden kehittymisen koulutuksensa aikana. Tutkimuksessa keskityttiin ammattikorkeakoulussa opiskelevien fysioterapeuttiopiskelijoiden (n=35) koko opiskeluajan ammatillisen kehittymisen polkuun. Laadullista aineistoa (kirjalliset esseet ja avoimet haastattelut) kerättiin opiskelun alussa ja lopussa. Aineistoa analysoitiin fenomenografisella ja narratiivisella analyysiotteella. Tutkimus-kysymykset olivat: minkälaisia käsityksiä opiskelijoilla on taidosta opiskelunsa alussa, miten opiskelijat kokevat reflektiivisen kirjoittamisen oppimisen välineenä, minkälaisia käsityksiä opiskelijoilla on omasta osaamisestaan valmistumisvaiheessa ja miten opiskelijat kuvaavat ammatillisen osaamisensa kehittymistä ja minkälaisia tarinamalleja kuvauksista voidaan identifioida. Opiskelijoilla oli opiskelun alussa erilaisia käsityksiä taidosta. Taito ilmeni joko lahjakkuutena, tai sen ajateltiin edellyttävän yksilöllistä harjoittelua, sosiaalista kanssakäymistä tai yhteistyötä muiden henkilöiden kanssa. Kokemukset reflektiivisestä kirjoittamisesta olivat myös erilaisia. Kirjoittaminen tuli esiin hyödyttömänä tehtävänä, asioiden ymmärrystä syventävänä toimintana, itsereflektion ja oppimisen välineenä tai ammatillisen kehittymisen välineenä. Valmistumisvaiheessa osaamisen käsitykset vaihtelivat ja ilmenivät ydintaitojen hallintana, fysioterapian teoreettisten perusteiden ymmärtämisenä, kokonaisvaltaisena käsityksenä fysioterapiasta tai sitoutumisena moniammatilliseen yhteistyöhön ja sen kehittämiseen. Tarinamallit muodostuivat yleisimmistä ammatillisen kehittymisen tekijöistä ja juonen erilaisista käännekohdista opiskelijoiden kehittymisen poluilla. Käännekohdat havainnollistivat kriittisiä tapahtumia opiskelijan ammatillisessa kehittymisessä. Tutkimustuloksista nousi esiin sekä empiirisesti että teoreettisesti perusteltavissa olevia kehityksellisiä teemoja: tunteet, reflektio, konteksti, kulttuurinen tietoisuus. Tulokset antavat lisätietoa opiskelijoiden osaamisesta ja ammatillisesta kehittymisestä korkeakouluopintojen aikana. Tuloksia voidaan hyödyntää ammatillisen kehittymisen tukemisessa korkeakouluissa, osaamisen tason syventämisessä sekä kehitettäessä fysioterapeuttikoulutusta.

Avainsanat: fysioterapeuttiopiskelijat, fysioterapeuttikoulutus, korkeakoulutuksen ammatillinen osaaminen, ammatillinen kehittyminen, laadullinen tutkimus

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To develop myself, I mean my strong motivation for lifelong learning, has been my guiding light throughout the dissertation process and in my whole life. Like the physiotherapy students illustrating their own stories and changes during their studies, I have also lived according to the results of my research. Along the way in my life there have been a variety of turning points and interests, also enormous pleasure and excitement about working as a researcher. I also developed my own teaching style and found new educational and pedagogical solutions. This dissertational journey has been long but interesting and usually even a 'flowing' experience. This is now one turning point in my life. One part of my lifelong learning story has now been achieved by reaching this goal, and in turn the pursuit of the next target in my life begins. To work as a novice researcher in research team with great supervisors has been a good counterbalance to my work as a lecturer. At the same time, there was space and the opportunity to develop and grow as a person as a human being in different contexts with different people, with students, colleagues and supervisors. I want to warmly thank everyone who has supported and guided me, giving me the possibility to progress in my "lifelong story" toward this goal.

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I am grateful to my family, my mother, brother and his family. You are with me wherever I go. Finally, my deepest gratitude and thoughts go to my dear husband Jukka, I thank you with all my heart. With you, I find the love and strength that keep me afloat, come what may. I feel so very grateful that I am able to share this life with you – I love you!

Jyväskylä, 21 January 2019

Merja Kurunsaari

FIGURES

TABLES

LIST OF ORIGINAL PUBLICATIONS

This thesis is based on the following publications, which will be referred to in the text by their Roman numerals I–IV:

I Kurunsaari, M., Piirainen, A., Tynjälä, P. (2015). Physiotherapy Students' Conceptions of Skill at the Beginning of Their Bachelor Studies. Physiotherapy Theory and Practice, 31(4), 260–269. doi:10.3109/09593985.2014.996692.

II Kurunsaari, M., Tynjälä, P., Piirainen, A. (2016). Students' Experiences of Reflective Writing as a Tool for Learning in Physiotherapy Education. In G. Ortoleva, M. Bétrancourt, & S. Billet (Eds.), Writing for professional development. Studies in Writing, Volume 32. Language & Linguis. Leiden/Boston: Brill, 129–151.

III Kurunsaari, M., Tynjälä, P., Piirainen, A. (2018). Graduating Physiotherapy Students' Conceptions of Their Own Competence. Vocations and Learning 11(1), 1–18. doi:10.1007/s12186-017-9177-8.

IV Kurunsaari, M., Tynjälä, P., Piirainen, A. Stories of Professional Development in Physiotherapy Education. Submitted for publication.

The data used in this doctoral dissertation consisted of essays written by 35 physiotherapy students in 2009, followed by open interviews with 33 of these students (32 using reflective writing) in 2011–2014. The data was collected from one University of Applied Sciences (UAS) in Finland. Merja Kurunsaari contacted the UAS and asked permission for collecting the data as well as the students themselves literally. Merja Kurunsaari met students personally and told them both orally and literally the aims and meaning of the research. She collected the essays and interviewed the voluntary students at the end of their studies. The research focused on the whole study path of students from the very beginning of their studies to their graduation.

In all original publications, Merja Kurunsaari had the main responsibility of all phases as the first author. The design of the study was done together in a research group with Arja Piirainen and Päivi Tynjälä. Analyses process and interpretation of the data was discussed also in the group. The writing process and submissions of the articles were in Merja Kurunsaari's responsibility. Overall, the meaning of the supervision and reflection and feedback in all of the original articles by Arja Piirainen and Päivi Tynjälä has been important in all of the phases in the research process. Together in a research group was thought also in which journals to submit the original articles.

CONTENTS

1 INTRODUCTION

Today's rapidly changing society and world of work, particularly the overall progress of information and communications technology, pose new challenges for citizens' health and well-being. In daily habits and work, the continuous use of smart devices has increased people's inactive time and reduced regular exercise, which, in turn, has increased both physical and psychological stress. There is growing evidence that the ageing and of different lifestyle diseases, chronic illnesses, mental health problems, and of clients and patients with complex disorders from different cultures, and of people demanding more from their health service (Murto et al. 2017; Probst & Skjaerven 2018; THL 2018). Furthermore, in Finland, a significant social welfare and health care reform (SOTE) has been planned for years to reorganise all social and health care services in order to ensure high-quality, equal and adequate services to the population (THL 2018). All those social and political changes also pose challenges for the physiotherapy practice and physiotherapy education.

In order to respond to those challenges, physiotherapists have become more aware of their larger role in society regarding the physical and social well-being of people (Foster & Delitto 2011; Nicholls & Holmes 2012; Synnott et al. 2015; Testa & Rossettini 2016). Societal changes and technological developments are modifying the profession of physiotherapy as well as the nature of physiotherapy. Many researchers have turned their attention from the biomechanical perspective to the holistic or embodied approach to physiotherapy needed to overcome the challenges of new technological, societal and economic developments (Cott et al. 1995; Broberg et al. 2003; Nicholls & Gibson 2010; Nicholls et al. 2016; Gard & Skjaerven 2018). The new attitudes and innovative ways of working in the field of physiotherapy are needed to manage the changes. One example of preparing for the future of the practice is the transfer of tasks regarding musculoskeletal disorders currently performed by physicians to physiotherapists. Changes of this kind could also yield savings in health costs (Helminen & Kuukkanen 2015; Kangas et al. 2015; Kuukkanen & Helminen 2015; Marks et al. 2017).

Moreover, recent studies highlight the significance of learning within the dynamic community of practice (Black et al. 2010; Fitzsimmons et al. 2017) and the need to engage in active lifelong learning through organised education, self-directed learning, and research (e.g., Lekkas et al. 2007; French & Dowds 2008). At the same time, educationalists are challenged to plan new kinds of pedagogical practices to prepare professions for the unknown future (Higgs et al. 1999; Tynjälä 2008; Tynjälä & Gijbels 2012; Schoo et al. 2015; Breuer et al. 2016; Pullon et al. 2016; Randall et al. 2016; Yokogawa et al. 2017; Barradel et al. 2018).

Physiotherapy is an internationally recognised health profession and may only be practised by qualified physiotherapists who have professional autonomy. In other words, qualified physiotherapists have ”the freedom to exercise professional judgement in health promotion, in [injury] prevention and in the care and treatment of clients and patients within the limits of the therapist’s prevailing knowledge and competence” (World Confederation for Physical Therapy – WCPT 1995, 12; 2011). The promotion of wellness requires physiotherapists to rehabilitate, treat, counsel and support populations’ health, that is, their physical and social well-being and functioning, by using various guidance and teaching methods as well as physiotherapeutic treatments (WCPT 2011; ENPHE 2017).

A Bachelor’s degree in physiotherapy education is offered at 14 universities of applied sciences in Finland. The qualification includes general skills, a set level of competence in rehabilitation, and professional core competence in physiotherapy. Qualified physiotherapists can further their vocational competence by a completing a Master’s degree at a university of applied sciences or at a traditional university. After the Master’s degree, it is possible to continue studying for a scientific postgraduate degree (licentiate and doctoral degrees) at a university (OKM 2018a; 2018b; Sjögren et al 2015; Sjögren et al 2016; The Core Competences of a Physiotherapist 2018).

Within postgraduate programmes, physiotherapy can be studied as a major subject only at the University of Jyväskylä, where also specialised education for physiotherapy teachers is available. In other countries, university-level education for physiotherapy teachers is uncommon (Suhonen 2008; Piirainen 2014). Physiotherapy education has been highly valued among applicants for many decades; only every 8th to 10th applicant is accepted for a study place in physiotherapy (Vipunen – Education Statistics 2018). Due to the ageing of the population, for example, there is an increasing need for rehabilitation professionals, and, consequently, the number of study places in physiotherapy education has increased. The number of graduated students has increased from 359 in the year 2004 to 625 in 2017 (Valvira 2018; Vipunen – Education Statistics 2018).

Recently, in Finland, a debate on physiotherapy qualifications and the degree requirements has started. In the international conferences of physiotherapy, it has been found that the Finnish Bachelor’s degree level of physiotherapy education has similarities with the Master’s degree studies in

many other countries. Therefore, it is important to analyse, what kinds of conceptions of competences and education Finnish physiotherapy students have to fulfil Master's degree requirements. This is a topical issue at the moment and has been discussed now and then in the past as well. As early as the 1990s, there was a research and development project in which the University of Jyväskylä and the University of Applied Sciences of Jyväskylä together educated physiotherapy students who proceeded to a Master's degree at the end of their studies (Hynynen 2001). Yet, the change in physiotherapy degrees did not occur at that time. In the year 2006, when the European Qualifications Framework (EQF 2008a) was published, Finnish physiotherapy education was defined along the educational Level 6 of the EQF6 requirements.

There are many reasons to strive for extended physiotherapy education also in Finland. The competence-level requirements of the physiotherapy profession have increased. Especially the science of physiotherapy has developed rapidly and new study fields continue to appear. Furthermore, the physiotherapy profession requires diverse literacy skills, critical thinking and understanding, and the ability to carry out research, to evaluate scientific research and to apply study results to practical problems (Kemmis & Trede 2010; Leahy & Dolan 2010; Binkley et al. 2012; van Laar et al. 2017; Barradel et al. 2018). Physiotherapy is under transformation also because of technological developments. Physiotherapy methods and treatments are diversifying and developing, which will advance patients' rehabilitation or recovery and healing process with respect to many types of diseases and injuries. Preventive physiotherapy is particularly important nowadays as decreased exercise and movement produces new challenges concerning people's physical condition, mental health and ergonomics. A further reason to widen education is the reforming physiotherapy paradigm as well as the multidisciplinary theoretical bases of physiotherapy treatments (Nicholls & Holmes 2012; Nicholls et al. 2016; Gard & Skjaerven 2018). The foundational fields of science—such as medicine, anatomy, physiology, kinesiology, motivation psychology and learning psychology—develop continuously, and the multidisciplinary basis of physiotherapy strengthens the challenge to widen physiotherapy education and extend the study time. The significance of understanding the effectiveness of physiotherapy, rehabilitation and research evidence is increasing. Furthermore, it is challenging to manage as a physiotherapist in a tightening economic situation when physiotherapy services, both in public and private sectors, have to be of high quality and effective while also needing to be produced cost-effectively. For all these reasons, wider education and deeper understanding and knowledge are needed more than ever before.

Professional skills and competences of physiotherapy have been defined in several studies. Researchers have examined physiotherapy students' perceptions of their professional skills and competences, such as specific manual skills (Phillips et al. 2009; Snodgrass & Odelli 2012; Lo et al. 2015; Rossettini et al. 2017), disease-specific knowledge (Briggs et al. 2012), students' reflective and critical thinking skills in practice (e.g., Bartlett & Cox 2002;

Williams et al. 2002 Williams & Wessel 2004; Larin et al. 2005; Donaghy & Morss 2007; Clouder & Toms 2008; Cole & Wessel 2008; Roche & Coote 2008; Bartlett et al. 2013; Baradell et al. 2018), clinical decision making to assess high-quality clinical research on treatment efficacy (Yamato et al. 2017), interprofessional skills (Robson & Kitchen 2007; Hallin et al. 2009), digital competence and social competence (e.g., Larsson & Gard 2006; Lindquist et al. 2010; Grace & Trede 2013), and cultural competence (Fougner & Horntvedt 2012; Mostert-Wentzel et al. 2013; Wickford 2014). However, little is known about how the physiotherapy students perceive their professional development. This kind of knowledge is important for the development of physiotherapy education as it may reveal the critical aspects of education to which special attention should be given. The field of research on physiotherapy students' professional development, explicitly focusing on students' pathways in education, is narrow (see Lindquist et al. 2006a; Lindquist et al. 2010; Korpi et al. 2014). Physiotherapy students' awareness of their own thinking and behaviour can positively influence future students' professional development and the future competence level of the physiotherapy profession (cf., Wikström-Grotell & Eriksson 2012). Accordingly, the purpose of this dissertation was to seek, from different perspectives, a more profound understanding of physiotherapy students' conceptions of competence development.

2 THEORETICAL PERSPECTIVES ON PROFESSIONAL DEVELOPMENT

2.1 Theories of professionalism

When investigating professional competence, it is important to understand the development of the profession itself in the particular field, in this study in the field of health care. In this chapter, the concept of professionalism is examined, and after that existing research on professional development in the field of physiotherapy is reviewed.

There are different ways of approaching professionalism, and the most famous one is Weber's concept of ideological professionalism. Max Weber developed the concept of professionalism as an ideology in the 1960s. According to Weber's (1968) professionalism, professions represent established and exclusive or closed (introverted) expert systems, each with its own absolute ethos or mentality. These exclusive expertise systems process semantic meanings in their own context and they live in their own world; for example, the profession of medical experts or doctors in the field of medicine or nursing. These meanings are manifested and represented in the qualifications of professions, uniforms, disciplined and operational principles or guidelines, and stability of institutions. Operations are formulated as justified and reasonable products and results in the strategy of professions.

In Weber's time, the expert was seen as a representative of the institution or profession. According to Weber (1968, 556), an expert is "the 'man of a vocation' or 'professional' (Beru/Mensch), and its unique result was the rational organisation of social relationships". Further, Weber (1968, 1200) illustrated the profession as follows: "Life is focused not on persons but on impersonal rational goals". Weber represented bureaucratic managerism, where cost-effective and market-based consumerism is central to the work, and everyone has a chance to earn his or her own profit and benefits. Furthermore, Weber (1968, 775) asserted that professionals were needed for the development of a rational system of law. In this way, professionalism promoted

professionals' own interests, such as their dominant position, prestige, influence and salary. The demands and goals of the market economy and financial issues changed the professions. Moreover, in Weber's time, professions were part of the social modernisation, and knowledge and expertise were necessary or a functional part of modern society. An expert among local authorities played an active role in society. Professionals formulated institutional expert groups that were able to make progress toward resolving key social issues and were contributing to the common good. The expertise of the profession focused on the specialisation in the particular profession. The layman's role was only to follow experts' articulation. Also, later on, specialisation became increasingly central in the professional identifying and development of professions (Evetts 2011).

One field of the study of professionalism was research on professional culture. According to Freidson (2001), from the historical perspective, the theories of professionalism focused on the development of professions with a view to perfecting them. The roles of professionals and professional cultures were characterised by the time in history, reflecting historical factors as well as social class and gender issues. The commitment of professions to the values of good and qualified work was central. Professional values emphasised a shared identity based on competencies produced by education, training, apprenticeships and socialisation and sometimes guaranteed by licensing. Professional relations were characterised as collegial, co-operative and mutually supportive, and relations of trust characterised the *practitioner–client* and the *practitioner–employer* interactions (Evetts 2011).

Hager et al. (2012) have advanced the discussion about the implications of the theorisation of professional practice where practice, learning and change impact on each other. Based on their conceptualizations they have classified theories of learning into three branches: cognitive-psychology-based theories, socioculturally referenced theories and sociomaterial understandings of learning. Further they consider the connection between learning and change as the norm and for that reason important. According to their theorisations of practice the emphatic sociomaterial understandings appears in five principles where understandings of practice, learning and change are complexly entwined and interconnected with each other. The first principle, "knowing-in–practice", presents the idea of professional knowledge as the ongoing changing process, the second one points out the sociomaterial network in constant unsteadiness, the third one emphasises the relationality of practice which changes, the fourth principle suggests the historicity of practices and the fifth one emphasises the growth of unpredictable practice.

In the field of health care, professional culture can be seen as an integral part of professionalism. Doctors', physiotherapists' and nurses' professional values, ideology or way of speaking (professional language) emphasise a shared professional identity, which is based on the competence acquired through education and the socialisation process in the particular context (Freidson 2001; Evetts 2011).

In recent decades, professionalism in general has broadened from the combination of professional knowledge and skills, ethical principles, and professional procedures to focus on professional autonomy and accountability to society and the professions. Furthermore, the commitment to continue one's professional development through reflective practice, communication and professional relationships is central. The strengthening of the autonomy of the professions requires constant scientific development, education and lifelong learning (e.g., Eraut 1994; Grace & Trede 2013).

In the fields of social and health care, the units producing clients' rehabilitation examinations with a multi-professional team (doctors, nurses, physiotherapists, social workers, etc.) have both the aims and principles of consumerism and some of managerialism (Haapakoski 2015; see also Freidson 2001). Haapakoski (2015) argues that rehabilitation professionals can build a collective professionalism, where the main goal of achieving a good, quality life is important considering the pressure of the economy and financial issues. In addition to using various types of scientific and professional knowledge, skills and practices in social and health care, professionals are required to be familiarised with the experiences of their customers and patients. Only then can the rehabilitation or physiotherapy process progress toward the right and reasonable goal. In this kind of multi-professional process, clients and patients must have the autonomy to consider and time to understand and reconcile their different fields of knowledge and information together (see, e.g., Piirainen & Sjögren 2016).

2.2 The multidimensional concept of competence

The term 'competence' is a nebulous concept that is defined in different ways in various research fields and disciplines. We can also see the term 'competence' and 'competencies' used in the everyday language of education and work. The concept of 'competence' is widely used in higher education, but there is considerable conceptual and terminological confusion concerning this concept and its relation to concepts and terms such as 'knowledge', 'skills', 'ability', 'know-how', 'qualification', 'performance', 'capability', 'expertise', and professional 'agency' (Eraut 1994, 1998; Ellström 1997; Tynjälä 1999; Isopahkala-Bouret 2005; Ellström & Kock 2009; Wesselink & Wals 2011; Eteläpelto et al. 2013; Koenen et al. 2015).

The theoretical differences between the concepts of competence have been examined in numerous studies (Eraut 1994, 1998; Messick 1994a, 1994b; Ellström 1997; Le Deist & Winterton 2005; Hogg 2008; Ellström & Kock 2009; Mulder et al. 2009; Mulder 2011; Wesselink & Wals 2011; Mulder 2014; Koenen et al. 2015). One of the main theoretical differences between the definitions is the divergence between the concepts of competence (plural competences) and competency (plural competencies). According to Messick (1994a, 1994b), Horton (2000) and Hogg (2008), competence describes what people can do

while competency focuses on how they do it. In other words, competence refers to a skill and the standard of performance reached, while competency refers to the behaviour by which it is achieved. According to Le Deist and Winterton (2005), the usage of those concepts and definitions is inconsistent; competency often refers to behavioural areas and competence to functional areas. In the following in this dissertation, the term 'competence' is used to represent both of these conceptions of competence and competency.

Eraut (1998) classifies competence into two aspects: the individual personal view and social view. The individual view concerns attributes such as skills, knowledge, behaviours, motivations, attitudes and changes over a person's development. Another perspective, the social view, considers competence within the context of social situations. Mulder (2011, 2014; see also Mulder et al. 2009) outlines three approaches to competence theory: 'competence as behaviouristic functionalism', 'competence as integrated occupationalism', and 'competence as situated professionalism'. The first one, 'competence as behaviouristic functionalism', refers to seeing competencies as trainable and isolated knowledge and skills. In the second approach, 'competence as integrated occupationalism', competence is expressed as an integrated whole of knowledge, skills and attitudes that are in balance together and transform those elements into integrated personal capabilities, professional roles and situations. In other words, competence is treated as a holistic concept. In the third perspective of 'competence as situated professionalism', competence gets its meaning through the idea of interaction with other professionals in specific contexts. The specific use of this concept depends on the context of the users.

Ellström (1997) has formed a conceptual model of competence, identifying five elements: 'formal competence', 'actual competence', 'officially demanded competence', 'competence required by the job', and 'competence in use'. The basis of the model is comprised of the cognitive and metacognitive components (e.g., theoretical knowledge and intellectual skills) as well as noncognitive components related to values, interests, personality traits and social skills. In this model, competence is considered important and seen as an attribute of the individual, that is, each worker brings her or his own human capital or human resource into his/her job. It is possible to separate an individual's competence into two elements: formal competence and actual competence. The element of ´formal competence´ refers to the educational qualification, certificate of graduation or earned credentials. The element of 'actual competence' is defined as the individual worker's potential capacity when she or he successfully completes a particular job, task or handling of a certain situation. It does not represent only the certification of the profession, or the learning outcomes of divergent work, or different informal everyday activities. Actual competence is socially constructed and underlines the importance of creating a learning environment that offers opportunities for reproductive, productive and creative levels of learning.

Ellström (1997) divides job requirement competences into two separate elements: the official demand for competence and the competence actually required by the job. The element of 'officially demanded competence' includes the recruitment and the setting of wages. The element of 'competence required by the job' characterises the formation of a developmental expertise by the synthesis of the cognitive rational and the intuitive contextual perspectives on competence and work. It involves economic, social and ultimately political issues related to the content and organisation of work and considers the relations between education and work in the ongoing development process.

The fifth element, that of 'competence in use', represents the interactive view. The focus is on the interaction between the competence of the individual and the job. It refers to competence actually used by the worker in performing the particular job. Individual experience and factors such as self-confidence are important. Job-related factors, such as "the formal and informal organisation of the workplace with respect to worker autonomy, participation, task characteristics, and feedback", have a strong impact on the worker's own personal use of his/her competence in managing her or his job. Ellström (1997) underlines the developmental view of competence and competence formation, rather than the adaptive view.

The model in Figure 1 summarises the discussion on competence, and integrates Eraut's (1998) views of competence, Mulder's (2011) theory of competence, and Ellström's (1997) conceptual model of competence to present a general model of competence in physiotherapy. The model summarises the theoretical framework and the main competence concepts of this study. The four main elements of physiotherapy are named: formal and officially demanded competence, context-related competence, behavioural competence, and integrative professional competence. These competence elements are interrelated with each other, and, as a whole, can be seen as a dynamic basis for the process of learning physiotherapy.

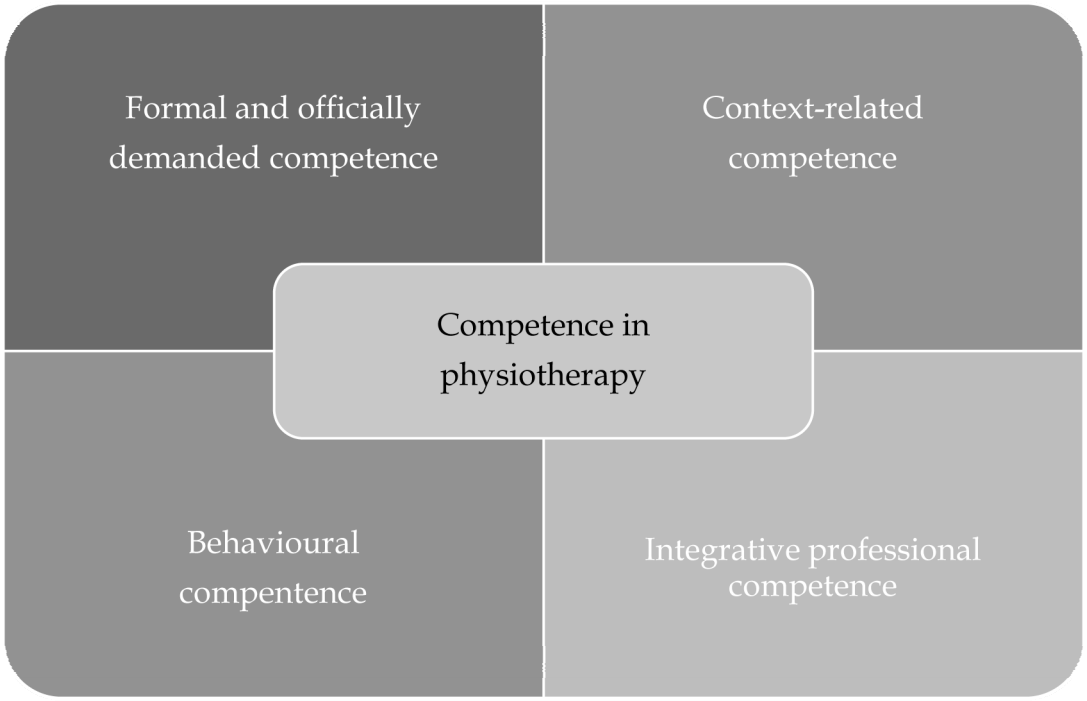


FIGURE 1 The elements of competence in physiotherapy.

The element of *formal and officially demanded competence* comprises physiotherapy's professional qualification competences based on the recommendations of the World Confederation of Physiotherapy (WCPT 2011), EQF (2008a, 2017), the European Qualifications Framework for Lifelong Learning in Physiotherapy (ENPHE 2017), and the National Qualifications Framework (NQF 2017). This competence includes legislation concerning physiotherapy education and the physiotherapist as a professional. The universities of applied sciences are in charge of physiotherapy education in Finland (Act on universities of applied science 932/2014; Amendments up to 563/2016), and only qualified physiotherapists can have the licence to work as a health care professional (Act on health care professionals 559/1994).

Context-related competence refers to competence requirements that vary between jobs' tasks, cultures and situational circumstances (Ellström 1997; Eraut 1998; Mulder 2011, 2014). In the field of physiotherapy, context-related competence varies to some extent depending on the workplace or type of work, project or work task, and guided practical training. Physiotherapists work in municipal health centres, in hospitals, and in various institutions, associations and projects, as well as in occupational health services and in private clinics, or as an entrepreneur or owner of a private clinic; nowadays, more and more work as a well-being or sports coach, a product or service developer, or as a team leader, and increasingly in temporary contracts.

Behavioural competence refers to skills, knowledge and attitudes that are visible to clients, their relatives, peer workers, and other professionals (see also Ellström 1997; Eraut 1998; Mulder 2011). It includes communication and collaboration with clients and patients, such as guiding clients and patients in

how to develop and achieve their own goals in rehabilitation (Higgs et al. 2001; Hall et al. 2010; Thornquist 2018). Furthermore, behavioural competence includes collaboration with other professionals as well as relatives and employers (Lachmann et al. 2013; King et al. 2016), and features participation in projects, networks, and utilising technology (Ashby et al. 2016; Randall et al. 2016).

Integrative professional competence is formed of the holistic and integrated whole of physiotherapy knowledge, skills and attitudes (see also Ellström 1997; Eraut 1998; Tynjälä 2008, 2010; Mulder 2011). Thus, it contains the professional core competences expected in the field of physiotherapy, that is, competence in physiotherapeutic examining and clinical reasoning, therapeutic competence such as special treatments, manual therapy and technics, and competence in teaching, coaching and counselling (Briggs et al. 2012; Dahl-Michelsen 2015; Lo et al. 2015; Rossettini et al. 2017). The professional perspective regards physiotherapists' professional autonomy, emotions, identity, position and role, as well as their level of understanding of the profession of physiotherapy and the relevant assumption skills, competences and knowledge of its practices (Praestegaard et al. 2014; Wikström-Grotell & Noronen 2015; Hammond et al. 2016).

2.3 Perspectives on the physiotherapy competences

In the field of physiotherapy, over the last three decades, researchers and clinicians have begun to pay more attention to philosophical principles, that is, ontological and epistemological assumptions on the background of physiotherapy theory and practice, and have asked and examined what forms the basis of physiotherapy (Hislop 1975; Cott et al. 1995; Broberg et al. 2003). The human body and its movement, independence, participation and function are seen as the key concepts of physiotherapy, understood in different ways depending on the ontological approach (Broberg et al. 2003; Nicholls & Gibson 2012).

In the following sections, literature on physiotherapy competences written from the following points of view are reviewed: the (1) ontological perspective, (2) epistemological perspective, (3) professional perspective, and (4) educational perspective. Next, the main ontological approaches to physiotherapy are examined more closely.

2.3.1 Ontological perspective

The ontological perspective represents beliefs about the nature of human beings and their relation to the world they experience (Lakoff & Johnson 1999; Lakoff 2012; Schlimm 2013). The discussion on the ontological perspective of physiotherapy has been going on for several decades (Hislop 1975; Cott et al. 1995; Higgs & Thitchen 1998; Broberg et al. 2003; Wikström-Grotell & Eriksson

2012). As early as 1989, Tyni-Lenne stated that physiotherapy should create the paradigm of *physiotherapy science*. She claimed that without this, every physiotherapist describes physiotherapy according to her or his own values and understanding (Tyni-Lenné 1989, 169). Furthermore, in the field of physiotherapy, the ontological perspective is seen to be challenging due to the influence of several closely related sciences. The physiotherapy paradigm and the theoretical bases of physiotherapy treatments have been developed and clarified together with the development of sciences such as medicine, anatomy, physiology, psychiatry, physics, kinesiology, psychology of motivation, and psychology of learning (e.g., Higgs & Thitchen 1998; Talvitie 1991b; Ottosson 2011; Wikström-Grotell & Eriksson 2012).

In physiotherapy, the ontological perspective has historically been explored with three approaches. First of all, a dualistic approach to how a human being is seen can be identified. The human being, the patient, is seen as an object of the treatment or advice. The second perspective is holistic; the human being is seen as a significant, active person, an independent agent of her or his own action (Cott et al. 1995; Broberg et al. 2003; Wikström-Grotell et al. 2013). The third and newest ontological perspective, the humanistic approach, is holistic as well; that is, the nature of the body is described with the concept of embodiment (Cott et al. 1995; Higgs et al. 2001; Broberg et al. 2003; Piirainen 2006; Nicholls & Gibson 2010; Wikström-Grotell et al. 2013).

The approach where the human being is seen as an object is based on biomedical and natural science research. The patient is seen as the passive object of the treatment and guidance, and physical treatments are based on passive movements and one-way instructions. The influence of other sciences, especially medicine, has led to the fact that there has been a biomedical and natural science paradigm in physiotherapy. This approach has greatly contributed to the position of the profession as the pre-eminent provider of orthodox physical rehabilitation (e.g., Talvitie 1991b; Ottosson 2011). There is evidence that the biomedical approach, where patients are seen as separate parts that comprise a body or as a system, is still guiding many physiotherapists (Higgs et al. 2001; Thornquist 2006; Nicholls & Gibson 2010; Wikström-Grotell et al. 2013; Nicholls et al. 2016; Rovner 2018).

The main focus of the physiotherapy profession has been on the deep and broad understanding of normal movement and impaired function, and has largely concentrated on biomechanical approaches as well as on neurophysiological theory, where environmental factors are barely taken into account (Hislop 1975; Talvitie 1991a, 1991b, 2001; Wikström-Grotell & Eriksson 2012; Wikström-Grotell et al. 2013). Carr and Shepherd (1987, 3) have even called physiotherapy a science of applied movement. The movement-centred thinking is also reflected in the names of physiotherapy treatments and in the emphasis of the treatments in physiotherapy curricula (Talvitie 1991a, 1991b). In her studies, Talvitie (1991a, b) has analysed the historical view of physiotherapy in relation to the phases of physiotherapists' work development in the 20th century. She found that physiotherapy, from its beginning, has been

related to gymnastics, exercise and movement. Physiotherapists are focused on the influence of human function and activity through movement. Movement and exercise treatments are based on the connection of physiotherapy to physical education and Ling's thinking model in the early 20th century. Ling's method was based on natural science, anatomical and physiological factors, where only particular movements are used and repeated over and over from some specific starting position, and the rigidness of movement therapy was one of the major aims. The view of the patient was splintered into pieces and the treatment target was a part of the patient, a shoulder joint, for example. As a historical tradition, Ling's perspetives on movement have impacted physiotherapy since the early 19th century. In the year 1813, in Stockholm, Sweden, Ling established the *Kungliga Gymanstiska Centralinstitutet,* where physical educators (preliminary professionals of physiotherapy) were studying; instruction was offered in gymnastics and pedagogical physical exercises to both healthy and sick people (Talvitie 1991b; Ottosson 2010; Wikström-Grotell & Eriksson 2012)

In the second ontological approach to physiotherapy, the patient is seen as an active agent constructing the world and being able to change her or his own action in relation to her-/himself and society. The holistic perspective integrates body, movement, function, and activity (Dilthey 1977; Broberg et al. 2003; Wikström-Grotell et al. 2013; Nicholls et al. 2016). This ontological approach started to appear in Hislop's publications (Hislop 1975). Helen Hislop was a physical therapy leader, educator and author, and her work on education and research contributed to shaping the profession of physical therapy. Hislop (1975, 107) presented a hierarchical model of human structures and functions based on pathokinesiology. According to her model, bodily movement can be examined on different levels, that is, the level of the: cell, tissue, organ, system of organs, individual, and family. In this model and system, each level is described as a functional whole, and as a part of the next greater whole. The target of this physiotherapy is to restore the balance in the system as a whole after dysfunction.

Twenty years later, Cott and colleagues (1995) continued the development of an approach of this kind. They presented a holistic approach to physiotherapy and movement that was even larger, conceptualising the science of physiotherapy further by distinguishing it from other sciences by the core concept of bodily movement. They presented the movement continuum theory of physiotherapy, where the maximal movement potential is at the centre of physiotherapy and seen in relation to a person's physical, physiological, social and environmental factors. In this view, the task of physiotherapy is to support the human being in trying to use her or his own maximal movement potential by applying different kinds of physiotherapy practices, such as therapeutic exercise, guidance, technologies and the implementation of changes to the environment.

The third ontological approach to physiotherapy, which has recently emerged, is the humanistic one, where the nature of the human body is seen

through the concept of embodiment (Piirainen 2006; Nicholls & Gibson 2010; Wikström-Grotell et al. 2013). In this approach, the psychological, social, cultural and geographical dimensions of health and illness, as well as the economic dimension of health care and funding agencies, are taken more closely into consideration in physiotherapy treatment (Higgs & Thitchen 1998; Higgs et al. 2001; Piirainen 2006; Nicholls & Gibson 2010; Wikström-Grotell et al. 2013). Many researchers have suggested that the embodiment perspective is needed as more evidence regarding the multidimensional and complex nature of physiotherapy is presented (Talvitie 1991b; Grönblom Lundström 2008; Skjaerven et al. 2008; Lindquist et al. 2010; Nicholls & Gibson 2010; Ottosson 2011; Main et al. 2012; Shaw & DeForge 2012; Wikström-Grotell & Eriksson 2012; Wikström-Grotell et al. 2013; Nicholls et al. 2016; Wikström-Grotell 2016; Thornquist 2018).

An ever broader spectrum of high-quality movement therapies is emerging (e.g., Roxendal 1985; Skjaerven et al. 2008; Ahola et al. 2017; Thornquist 2018), and physiotherapists widely agree that movement and the science of movement constitute the core of physiotherapy, its central concept. Wikström-Grotell and colleagues (2013) have presented the main perspectives on movement in physiotherapy as including: movement as a health cure, as a medical cure, and as an exercise cure. In her doctoral dissertation, Wikström-Grotell (2016) reflected on the gap between the scientific concept and the practice concept of movement in paradigms of physiotherapy. She proposed a holistic approach, where the human being is seen as an autonomous and active agent producing natural movement. The human being's self decides how to use the natural movement. According to Wikström-Grotell (2016), this is a holistic approach to the subject of physiotherapy science and research. The natural concept of movement is integrated according to the physical body, including the mind and emotions, which, in physiotherapy, are viewed as the basis for human existence and development (Broberg et al. 2003). Bunkan (2010) emphasises that physiotherapists need to understand patients' awareness of their body, emotions, self-confidence and trust in themselves in addition to the patients' ability to take care of their physical health. According to Rosberg (2000), the concept of the body takes various aspects into consideration: being aware of one's body and bodily signals, having confidence in one's body, and experiencing oneself as comprehensible, coherent and whole.

Broberg and colleagues (2003) continued to clarify the embodiment approach. To identify and recognise how social and individual elements influence both the bodily well-being and discomfort of patients is significant. In physiotherapy, the interaction between the patient and the physiotherapist forms a "bodily meeting", where the physiotherapist takes special responsibility for how the body is understood and thematised (see also Piirainen 2006). Bjorbækmo and Shaw (2018) have illustrated that physiotherapists use the concept of "embodiment" to examine the roles of knowledge and interaction incorporated through the body into physiotherapy practice. According to Nicholls & Gibson (2010), greater awareness of one's

body, that is, understanding the reality of *being embodied,* not just *having a body,* offers certain aspects of embodiment and holds particular relevance for developing a new science of embodied movement and possibilities for the further development of the physiotherapy profession. For example, in a study by Gard and colleagues (2010), physiotherapists were committed in a bodily, emotional and mental sense of the profession; and in a study by Gyllensten and colleagues (2010), bodily experiences were seen to "always exist" in the present moment, and body awareness included the identity, that is, the "embodied identity" (see also Dropsy 2002; Thornquist 2010, 2018; Mehling et al. 2011).

Nicholls and Gibson (2016) argue that the human body, the main concept in physiotherapy, is still quite under-theorised in studies. Thornquist and Kirengen (2015) found that patients' sickness history and their own experiences have been taken into consideration in physiotherapy, but in treatments patients are treated separately, that is, neglecting the interaction between body parts and systems. According to Thornquist (2001, 2018), the body can also be experienced as a problem or nuisance when stricken with illness, leading to discomfort or disability. Illness engenders a fundamental change in the manner in which the body is experienced.

Bjorbækmo & Shaw (2018) have pointed out that living in one's body unreflectively may well lead to regarding one's own body in an objectified mode, alienated from oneself. Learning and practising in order to be a physiotherapist and developing one's own professional competence presumes developing one's own embodied knowledge, that is, one's relation to the world as a physiotherapist.

2.3.2 The epistemological perspective

While the ontological discussions have gained ground in physiotherapy research, less research has been conducted from the epistemological perspective, that is, regarding the nature of knowledge. From the epistemological point of view, the theoretical foundation of competence can be derived from studies on expertise and expert knowledge. The forms of knowledge are traditionally divided into two basic categories: *declarative knowledge* and *procedural knowledge* (Anderson 1983). The former can also be described as 'know-that' and the latter as 'know-how'. In this traditional dichotomy, 'understanding' belongs to the former and 'skill' to the latter category, while 'competence', as a holistic concept, includes both. Often, a third component of expertise has been added to describe *metacognitive knowledge* (Bereiter 2002; Eraut 2004; Le Maistre & Par*é* 2006), which is related to the awareness of one's own knowing and thinking. Some researchers add *strategic knowledge* (Eraut 2004; see also Tynjälä 2009), which refers to knowledge about the context of the task at hand. Furthermore, some studies speak about *dispositional knowledge* (Billett 2011), referring to 'know-for', that is, knowledge comprising values, attitudes, interests and beliefs. Tynjälä (2009) and Tynjälä with Gijbels (2012) have presented a model summarising several accounts of *expert knowledge* (Anderson 1983; Bereiter 2002; Eraut 2004), comprised of four basic components of professional expertise: (1) conceptual or

theoretical knowledge; (2) experiential or practical knowledge; (3) regulative or self-regulative knowledge; and (4) socio-cultural knowledge.

Conceptual or theoretical knowledge includes declarative knowledge, which is factual or theoretical in nature. This kind of knowledge is explicit and can therefore be learned from books, journals, lectures, discussions and so on. The second component of expertise, *experiential or practical knowledge,* finds its expression in skills and psychomotor knowledge and is acquired mainly through practical experience. This procedural knowledge is often tacit and difficult but not impossible to express explicitly (Bereiter 2002; Eraut 2004). For example, when a person learns psychomotor skills through bodily adaptation, this takes place mostly in a subcognitive way (Lakoff & Johnson 1999; Bereiter 2002, 144–145; Lakoff 2012). According to Bjorbækmo & Shaw (2018), when knowledge is being put into practice, the procedural knowledge depends on the physiotherapist's 'bodily style', in other words, on her or his sensitivity and reflective embodied knowledge as well as developed professional competence. In practising physiotherapy, the 'bodily style' transforms the physiotherapist's relation to the world and her or his knowledge in various creative ways during the physiotherapy process. Through the lived experience of the physiotherapist, the practical knowledge is put to use. Furthermore, Bjorbækmo and Shaw (2018) argue that some physiotherapists are able to connect different forms of knowledge with their practice on a daily basis.

The third element of expertise, *regulative or self-regulative knowledge,* consists of strategic and metacognitive skills and knowledge and can be either implicit or explicit. Individuals use metacognition and self-regulative skills to evaluate and regulate their own activities and actions. Training reflection develops self-regulative knowledge (Bereiter 2002; Tynjälä 2008; Heikkinen et al. 2012; Tynjälä & Gijbels 2012).

The three basic types of knowledge described above (i.e., conceptual, experiential and self-regulative) represent personal, individual knowledge (Bereiter 2002; Eraut 2004; Tynjälä 2009), while the fourth component of expertise is comprised of *socio-cultural knowledge*. This form of knowledge is embedded in the practices and environments of social communities and can be experienced only through participation in these communities and by using the devices and tools that they provide (Wenger 1999; Bereiter 2002; Eraut 2004; Tynjälä 2009).

Tynjälä and Gijbels (2012) emphasise that although these four basic elements of expertise can be discerned analytically, they are far from separate entities, being tightly integrated as a whole. In this view, knowledge and skills cannot be separated from each other in professional competence but are deeply interrelated and integrated.

The epistemological approaches, especially research focusing on expertise in the field of physiotherapy, are narrow (Boekhout et al. 2010; Piirainen & Viitanen 2010). Some studies have focused on how physiotherapy students acquire regulative knowledge, such as reflective and critical thinking skills, in practice (Bartlett & Cox 2002; Donaghy & Morss 2007; Clouder & Toms 2008;

Cole & Wessel 2008; Roche & Coote 2008), whereas only Le Maistre and Paré (2006) have attempted to present a holistic model of expert knowledge in the field of physiotherapy. They interviewed final year students as well as freshly graduated newcomers in their first two years at work as well as their experienced colleagues in four professions, including physiotherapy. Based on their findings, they presented a typology of professional identity divided into two main components: professional knowledge and personal knowledge. The first main category, *professional knowledge,* is comprised of content knowledge, procedural knowledge, and knowledge about the profession (e.g., organisational, geographical, cultural and political information). *Procedural knowledge* includes skills, practical knowledge and tacit knowledge, and finds its expression in implementing different procedures, in knowledge about clients, and in psychomotor knowledge relating to the touch and tone of the voice in physiotherapy. The second main category, personal knowledge, involves metacognitive knowledge of oneself as a learner and worker, and as such it resembles regulative knowledge in Bereiter's (2002) classification.

Physiotherapy science in itself is combined of varied multidisciplinary sciences, both natural and humanistic sciences. The basic aspects of the knowledge base of physiotherapy have been structured, for example, in a comprehensive research and development project that was carried out by the Association of Finnish Physiotherapists (Sjögren et al. 2015; Fysioterapeutin ydinosaaminen 2016; Sjögren et al. 2016; The Core Competences of a Physiotherapist 2018). The basic aspects of the knowledge in physiotherapy, which describe physiotherapy science from the perspectives of its scientific knowledge base, theory-based practical models and evidence-based guidelines is presented in a structured model (The Core Competences of a Physiotherapist 2018, 5-6). The model shows that different levels of knowledge continuously interact in a physiotherapist's clinical reasoning. Furthermore, it has a multidisciplinary basis and both social and psychological sciences are acknowledged. (The Core Competences of a Physiotherapist 2018, 5-6) The structured model clearly shows that the biomedical approaches are dominant in this model, whereas holistic and humanistic approaches are not acknowledged.

2.3.3 The professional perspective

The professional perspective is related to all four components of the model of competence in physiotherapy: behavioural competence, formal and officially demanded competence, context-related competence, and integrative professional competence (Figure 1). The professional perspective on physiotherapy appears in relation to professional autonomy, identity, position, role and competences. These aspects develop all the time and have changed increasingly in recent times. (Nicholls & Holmes 2012; Praestegaard et al. 2014; Nicholls et al. 2016) The physiotherapy profession and education are regulated by laws and norms. In other words, physiotherapy can be practised only by qualified physiotherapists, who have professional autonomy. Furthermore, historical factors, social class and gender issues, political and economic

structures, cultures and values, as well ideas and thoughts of the other health professions influence the physiotherapy profession (Almås & Ødegård 2010; Praestegaard et al. 2014). Professional development is a lifelong process of formal and informal learning, and tacit knowledge deepens learning in workplaces (Öhman et al. 2002).

The physiotherapy profession demands prevailing knowledge and competence in the field of physiotherapy. According to the World Confederation for Physical Therapy (WCPT, 1995, 12) professional autonomy enables the "freedom to exercise professional judgement in health promotion, prevention and the care and treatment of clients and patients". As early as 1985, John Øvretveit (1985), pondering the medical dominance in physiotherapy, argued that the autonomy of the profession is constructed of two main aspects: 'clinical autonomy', that is, physiotherapists take sole responsibility for clinical decisions, and clinical freedom or 'practice autonomy', which means that physiotherapists assess patients' and clients' needs and opportunities in rehabilitation rather than exclusively responding to doctors' referrals. According to Sandstrom (2007), the interaction and dialogic communication between the patient and physiotherapist support and develop both the physiotherapist's professional autonomy and the patient's individual autonomy in therapy and confidence in the professional's services as proper and high-quality activities.

The professional approach is also viewed in relation to professional identity. In recent studies, professional identity has been seen as an ongoing, dynamic and active process, which varies with time and situations rather than being a static state (Higgs et al. 2001; Wikström-Grotell & Noronen 2012; Hammond et al. 2016; Thornquist 2018). The professional self-concept is often associated with and based on ever-evolving beliefs, values, myths, attributes, motives and different experiences. Physiotherapists co-construct, consciously or unconsciously, the meaning of being a physiotherapist within the intraprofessional and interprofessional communities of practice. However, physiotherapists themselves are responsible for developing their own professional identity (Higgs et al. 2001; Wikström-Grotell & Noronen 2012; Hammond et al. 2016; Thornquist 2018).

The active and responsible role of developing one's own professional competence is significant to advance toward management in work. In a study by Hammond and colleagues (2016), physiotherapists who conversed in their workplaces about ethical and moral reasoning developed a stronger sense of what they believe, value and know.

Thornquist (1994, 709; 1995, 187) found that physiotherapists confirm their professional identity through the work with their patients, since the basis of physiotherapy has mainly grown from practical experience, specifically, the functionality of patients' body as well as their experiences and opinions. Also Jensen and colleagues (2000), Piirainen (2006) and Parry (2009) stress patient work in professional identity development, especially physiotherapist–patient communication, and argue that mutual interactions with the patient tend to be

educative, help the patient, dispel patient resistance, and maintain hope while also taking emotions into consideration (Wiles et al. 2004; Hall et al. 2010).

As early as in 1999, Noronen and Wikström-Grotell (1999) argued for the need to investigate professional knowledge and the assumptions behind the professional paradigm in order to guide physiotherapists in their practice. They regarded physiotherapy as an applied science with its own knowledge base and its educational methods as based on that knowledge, and as a practical application that has an important task in society. Physiotherapy has evolved from an orientation toward diseases, impairments and symptoms of patients to the overall health, functional activity and participation of the patient in her or his particular life situation. They outlined four components of the professional paradigm in physiotherapy: the focus of the interest of their own profession, the competence component (what to do and know), the world view (how the field of practice is understood), and the view of science (how the field is viewed by others). The components include the following competences: therapy skills, communication and co-operation skills, the ability to acquire and process information, the internationalisation of the profession, and understanding the professional culture (Noronen & Wikström-Grotell 1999).

In their recent study editorials' (of international scientific physiotherapy journals) experiences of the development of physiotherapy as a profession, Wikström-Grotell & Noronen (2015) found three themes: the physiotherapy profession and its position in society, professional responsibility (including roles and sphere), and internationalisation. Findings related to physiotherapy research had three themes: emerging research, evidence-based physiotherapy and knowledge base, and theory development.

Furthermore, the group of educators who are members of the European Region of the World Confederation of Physiotherapy (ER-WCPT) has been actively working with ESCO, the *European Skills/Competences, Qualifications and Occupations* classification committee, and has developed and specified seven physiotherapist roles: 1) Physiotherapy expert (assessment skills, diagnostic skills, intervention skills), 2) Communicator, 3) Collaborator, 4) Manager, 5) Health care promotor, 6) Reflective practitioner, and 7) Professional (ESCO 2017; see also ER-WCPT 2008).

Moreover, professional competence has been considered from the perspective of the boundaries between professions and the collaboration with other professions. Even during the 1980s, the occupational boundaries of professions were tight; understanding others' work and other professions was rare, professionals and employees worked at various levels in the hierarchy of their organisation, and communication with others was uncommon (Freidson 1988). The position in a hierarchy affects communication, co-operation, leadership and equality (Talvitie 1991a, 43). Nowadays, multi-professional collaboration and development together with other health and social professionals is active (e.g., Lachmann et al. 2013; King et al. 2016) already during the education phase (Kuukkanen & Hynynen 2016). Kelland and colleagues (2014) interviewed advocates and agents in Canada regarding the

most important issues in the physiotherapy profession and in their own work. They found that the interviewees regarded collaboration, communication, scholarly practice, management, professionalism, passion, perseverance and humility as the most significant key components of their profession. Moreover, they stressed that effective collaboration requires strong communication skills and strategic partnership building skills.

At present, every profession in the field of health care must prove the scientific argumentation of their work. The scientific understanding forming the basis of physiotherapy has been developed more and more systematically (Westerdal 2013). The emergence of various points of view of physiotherapy is influenced by the findings of different branches of science (Talvitie 1991a). The physiotherapy profession started to utilise the evidence-based discourse relatively early, despite the fact that experimental research in physiotherapy was poor (Jette & Haley 2005). According to Hammel and Carpenter (2004), Jette and Haley (2005) as well as Bjorbækmo & Shaw (2018), this may be related to the close commitment of physiotherapy to the medical practice and medicine as well as to the positivist perspective of the science of medicine.

The physiotherapy contents have varied in different countries and eras (Talvitie 1991a, 1991b). Descriptions of the core competences of physiotherapists have been produced in a number of countries, including the United Kingdom, Canada, New Zealand, Australia, the Netherlands and Austria. In general, it has been emphasised that physiotherapists need to be versed in various special competencies, such as skills in chronic disease management, monitoring and making early referrals in addition to having disease-specific knowledge (Briggs et al. 2012) and competence to cure and care for patients (Dahl-Michelsen 2015). Furthermore, core competences, in particular manual skills (Phillips et al. 2009; Lo et al. 2015) and the development of learning these are seen as essential and important (Snodgrass & Odelli 2012; Rossettini et al. 2017).

The core competences of Finnish physiotherapists were defined in a comprehensive research and development project (Sjögren et al. 2015; Fysioterapian ydinosaaminen 2016; Sjögren et al. 2016 ; The Core Competences of a Physiotherapist 2018), and these are presented in Figure 2. The most central area of the figure shows the core competences of physiotherapy, and the outer circle describes the core areas of competence that are common among other professional groups. All areas of competence are constantly interacting with each other. Furthermore, different operating environments, partners co-operating and changes in society bring variety to the core competences.

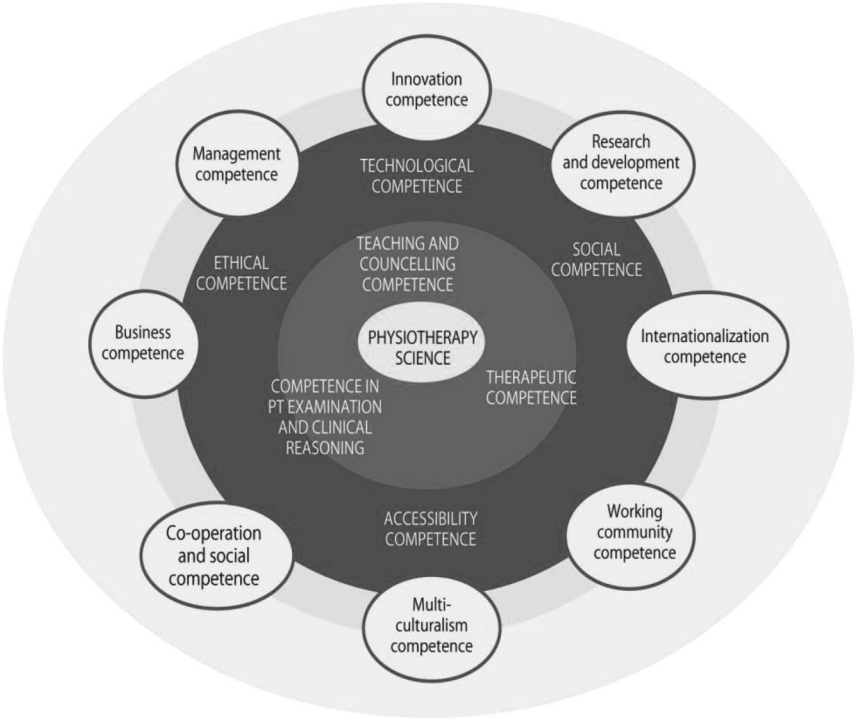


FIGURE 2 Physiotherapists' core competences (Sjögren et al. 2015; Fysioterapian ydinosaaminen 2016; Sjögren et al. 2016 ; The Core Competences of a Physiotherapist 2018, 13).

2.3.4 Educational perspective

The main aim of this dissertation was to deepen and broaden the understanding of physiotherapy students' professional competence development during their education by considering it from different perspectives. In the following section, physiotherapy competence is examined in the context of physiotherapy education.

The starting point and basis of professional development is a formal physiotherapy education. Physiotherapy education prepares physiotherapists by helping them gain an adequate level of competence and sufficient amount of experience to enter the profession, and it promotes their readiness to continue their professional development in order to develop their practice to be able to meet the challenges posed by changes in today's complex world. However, the critical determinant of professional standing is the success with which the educational programme lays the foundation for responsible, proactive behaviour and commitment to professional and personal growth (see Higgs 1993; Higgs et al. 1999; EQF 2008a, 2008b; 2017).

2.3.4.1 Physiotherapy education in Finland

In Finland, due to certain characteristics of the health care system, physiotherapy education differs somewhat from related education in other countries (OKM 2018a; 2018d). These characteristics have complied with the medical, educational and social development changes. The demographic proportionality of the age groups of the Finnish population and changes in morbidity has had a major impact both on physiotherapy treatment practices and education. Furthermore, historically, the Second World War, diseases and the development of service systems have impacted the development of physiotherapy in general, physiotherapy treatments and physiotherapy education in Finland. As the average life expectancy has increased, diseases have changed, that is, cardiovascular diseases, cancer, diabetes, musculoskeletal problems and mental health problems have increased, and, at the same time, various kinds of new welfare and well-being systems have been developed (Talvitie 1991a, 1991b). Meanwhile, new treatments, especially therapeutic exercises, neuro-therapeutic treatments, functional training therapy, body awareness therapy and motor learning models were introduced (Knott & Voss 1968; Basmajian 1978; Licht 1978; Roxendal 1985; Carr & Shepherd 1987; Härkönen et al. 2016; Skjaerven & Mattson 2018). As a result of the development of learning theories and treatment developments, the patient role in physiotherapy changed from being approached as a passive object to being considered as an active, thinking and self-motivated subject (Basmajian 1978; Carr & Shepherd 1987, Skjaerven & Mattson 2018).

In the early 20th century, physiotherapy education in Finland was tightly interfacing with gymnastics teachers' education. In the year 1943, active physiotherapists established the *Professional Physiotherapy Association*. Two years later, in 1945, formal permanent physiotherapy education began to be offered. After the Second World War, health care developed strongly and systematically, especially public services but also legislation affecting social and health care. At the same time, the number of private physiotherapy clinics increased (Talvitie 1991b).

In the 1970s, the duration of physiotherapy education expanded from two to two-and-a-half years. At the beginning of the 1980s, significant secondary school reform changed Finnish vocational education, and the physiotherapy education programme was further extended to three-and-a-half years; also, continuing education in physiotherapy for a Master's degree and PhD started being offered at universities. (Statistics Finland 2018)

At the end of the 1990s, a new system of higher education revolutionised education yet again: alongside the traditional scientific universities, the new 'universities of applied sciences' were established to provide professionally oriented study programmes in, for example, physiotherapy, nursing, and engineering (OKM 2018a; Statistics Finland 2018). Accordingly, as part of this, curricular changes were made to the education system. At present in Finland, the 14 universities of applied sciences offer physiotherapy education and a

diverse range of courses for qualified physiotherapists to prepare for future challenges (OKM 2018a; 2018c). Moreover, widespread fields of continuing education, commonly involving clinical specialities—such as geriatric, sports, psychosomatic, cardiopulmonary and pediatric physiotherapy and orthopaedic manual therapy—are organised by professional associations (see, e.g., OKM 2018b, 2018d; Finnish Association of Physiotherapists 2018; Suomen Kuntoutusyrittäjät ry. 2018). The lifelong learning competences, in addition to the professional competences, are seen to be important in practising the professions and this is true all over the world (OECD 2005, 2013; EQF 2008b, 2017; ESCO 2017; European Commission 2017; Finnish national agency for education 2017).

2.3.4.2 Students' professional competence development in physiotherapy

The development of professional competence in physiotherapy is a long process (Larsson & Gard 2006; Grace & Trede 2013). In research literature, competence development has been conceptualised in various ways. In the field of physiotherapy, the conception of competence is firmly rooted in the physiotherapy profession and emphasises generic and core skills, especially clinical competence. In addition to the core competences in physiotherapy, professional competence development requires that students form a broader view of health and of the social and health care options, as well as gaining sufficient knowledge about other professions (see Higgs et al. 2009; Shields et al. 2013), experiences in collaboration with other professions (Robson & Kitchen 2007; Hallin et al. 2009), knowledge about different cultures (Fougner & Horntvedt 2012; Mostert-Wentzel et al. 2013; Wickford 2014), and a theoretical understanding of professionalism (Trede et al. 2011; Anderson & Irwin 2013).

There are numerous studies on students' professional education in the field of physiotherapy. In a study by Grace and Trede (2013), physiotherapy students' understanding of professionalism emerged as their viewing it as a complex interrelation of values, ethical decision making and practice knowledge, whereas subjects like cultural competence and environmental sustainability, which researchers have emphasised, were not found in the study. The professional development of students requires sufficient time. For example, in a study by Anderson and Irwin (2013), three weeks was too short of a period to bring about development regarding the major factors of professionalism, accountability, altruism, caring, excellence, integrity, professional duty, and social responsibility. However, in physiotherapy education, these characteristics have been developed sufficiently over 33 weeks of clinical training. Female students were more accountable, honest, and professionally dutiful in comparison with male students.

Lindquist and colleagues (2006) investigated Swedish physiotherapy students' professional identity and their perceptions of their role, practice, vision, beliefs and scope of practice as physiotherapists. In their results, the authors found three types of identity representative of the physiotherapy students: the Empowerer, the Educator, and the Treater. Larsson and Gard

(2006) argued that it is essential for students to understand what kinds of conceptions of physiotherapy, knowledge and paradigms interact in physiotherapy, and that the best way to use them depends on the particular work and interaction with the patients. They found four different perspectives on how theoretical and practical knowledge was applied in physiotherapists' work: in the interaction with patients, as a coach, so as to carry out effective therapy, and with the aim to act professionally according to the rules and interventions. Understanding has been deepened in practice, in the later phases of physiotherapy learning (Korpi et al. 2017).

Evidence-based practice is an integral part of physiotherapy professionals' training and students' professional development. Evidence-based practice incorporates clinical decision-making assessment of high-quality clinical studies on treatment efficacy (Kerry 2017; Yamato et al. 2017), and relates to issues of epistemology and the application of knowledge in practice (Bjorbækmo & Shaw 2018). Long et al. (2011) studied physiotherapy students' experiences of 12 months of intensive evidence-based practice at school. The findings showed that the understanding of evidence-based practice could add to students' confidence in practice and can have an effect on their future. Some studies have shown that even more evidence-based practices are needed (Shaw et al. 2010; Shaw & DeForge 2012).

In our complicated information-based and technological culture, health professionals increasingly need regulative knowledge, such as critical reflection skills. In critical reflection processes, professionals use higher-order thinking to analyse and evaluate their experiences. In such processes, theory is connected to practice, ideally leading to new innovations in dealing with patients (Gustafsson & Fagerberg 2004; Delany & Watkin 2009; Mann et al. 2009). Students' reflective and critical thinking skills in practice are studied a lot (e.g., Bartlett & Cox 2002; Williams et al. 2002; Williams & Wessel 2004; Larin et al. 2005; Donaghy & Morss 2007; Clouder & Toms 2008; Cole & Wessel 2008; Roche & Coote 2008; Bartlett et al. 2013; Greenfield et al. 2017). Researchers have stressed that the processes of reflection and re-evaluation among students, teachers and clinical educators need to be continual in order to develop deep understanding and self-regulation and assess which skills and attributes are important for the development of students' competence (Viitanen & Piirainen 2003; Jones et al. 2010). In a study by Furtze and colleagues (2015), clinical reasoning developed gradually, in steps, and advanced with increasing intensity and depth of reflection.

From the pedagogic point of view of professional growth and process challenges, physiotherapy educators need to take into account students' varied development pathways (Lindquist et al. 2006a; Korpi et al. 2014), different professional identities (Lindquist et al. 2006b), and the varying combinations of ways of learning, learning partners such as peer students and professionals, and learning in diverse contexts (Lindquist et al. 2010). Furthermore, students require teachers' active role in guiding and preparing them for the changing

future (e.g., Constantinou & Kuys 2013; Mulder 2013; Nicoll & Salling Olesen 2013).

2.3.4.3 Different pedagogical approaches in physiotherapy education

In recent years, a growing body of research on pedagogical approaches and experiments of physiotherapy education has been published. The teacher's role is more and more seen as that of a guide who encourages students by mentoring and coaching them to reflect on their own learning processes (e.g., Bereiter & Scardamalia 1987; Schön 1987, 1996; Mezirow 1990, 2003; Tynjälä 1998, 2001; Langer & Applebee 2007; Mulder 2013; Nicoll & Salling Olesen 2013).

Presented next are examples of recent studies focusing on the most commonly examined methods of students' learning in the field of physiotherapy. These are problem-based learning, digital and virtual learning, interprofessional learning, and various methods supporting reflection in learning, such as reflective writing.

Several studies have proven that the problem-based learning (PBL) method is a promising learning approach in physiotherapy education. Researchers have examined problem-based learning in the contexts of learning of motivational interviewing skills (Schoo et al. 2015), health promotion for the mothers of hearing-challenged children (Yokogawa et al. 2017), students' confidence regarding patient-handling decisions and practical skills (Johnston et al. 2013), skill application in practice (Gunn et al. 2012), and comparing other learning methods with PBL (Dahlgren & Dahlgren, 2002; O'Donoghue et al. 2011; Castro-Sanchez et al. 2012).

Recently, educational experiments based on virtual or digital opportunities have increased. According to a systematic review by Mącznik and colleagues (2015), the use of online technology studies typically involved websites and discussion boards. Methods such as telehealth, using video-based training modules in simulated and clinical settings (Randall et al. 2016), offer some interactive practice to prepare for direct clinical training (Alexander et al. 2016), but the retention problems in oncology by such e-learning have also received attention (Da Costa Vieira et al. 2017) in physiotherapy publications. The research has shown that students' own computer skills influence their satisfaction in learning by using technology (Ashby et al. 2016; Gardner 2016; Hurst 2016; Tilson et al. 2016) and that feedback is essential in this kind of learning (Ashby et al. 2016). According to physiotherapy students' experiences in the study by Hurst (2016), the combination of classroom and virtual teaching seems to be an especially useful way to learn new clinical skills. Learning simultaneously allowed students to practise skills repeatedly, because they could watch and practise as many times as they needed. When blended learning featuring technological options was compared to classroom-based learning, students' knowledge confidence was found to be similar (Hurst 2016). According to Rowe and colleagues (2013), the content of physiotherapy and pedagogical decisions should be the main starting point in planning new study modules by using technology, rather than the technology in itself.

According to Pullon and colleagues (2016), interprofessional collaboration and working with other health and social care professionals make it possible for physiotherapy students to respond to the changing world's challenges and patients' complicated demands for a life of better health. Co-reflection and collaborative reflection with other professionals in practical training help students to find and clarify their own professional roles. Therefore, interprofessional and critical reflection are included in many health care curricula, such as in those of physiotherapy and nursing (e.g., Gustafsson & Fagerberg 2004; Piirainen 2007; Piirainen et al. 2007; Delany & Watkin 2009). In recent years, interprofessional studies have been examined from the perspectives of communication and team-working skills among as well as between students and health care professionals (Cahill et al. 2013), knowledge of interprofessional collaboration and understanding regarding their and other health care professionals' roles (King et al 2016; Passmore et al. 2016), development of attitudes for interprofessional collaboration (Wellmon et al. 2017), and students' collaborative reflection on their own emotions as well as new knowledge creation (Lachmann et al. 2013).

As mentioned above, professional development requires critical reflection, both in the form of self-reflection and collaborative reflection, already in the school phase of development and in practical training periods in different environments (e.g., Pullon et al. 2016). From the pedagogical point of view, the interesting question in this regard is what kinds of pedagogical practices can promote reflection. Most often, in order to bring about the development of reflection, students' reflection is guided by learning tasks such as group discussions and reflective writing tasks (e.g., Hendrick et al. 2009; Breuer et al. 2016; Maroux et al. 2016). Research suggests that writing facilitates reflective thinking and makes it possible to explicate tacit knowledge and conceptualise experiences (e.g., Tynjälä 1998, 2001, 2008; Glover & Sweet 2016; Ortoleva & Bétrancourt 2016; Sullivan & Czigler 2016), and, therefore, writing competence is seen as a key factor in professional learning (Breuer et al. 2016).

Reflective writing has been investigated mostly with regard to written assignments and journal writing during practical training (e.g., Larin et al. 2005; Musolino & Mustrom 2005; Chirema 2007; Constantinou & Kuys 2013). Reflective journals have been found to facilitate physiotherapy students in analysing their feelings and considering how they might handle various patient situations in the future (Williams et al. 2002; Williams & Wessel 2004; Larin et al. 2005). Furthermore, students have to challenge themselves to reflect on the learning of skills and to achieve collaboration with different professionals (Hendrick et al. 2009; Piirainen & Viitanen 2010; Danielsson & Rosberg 2015; Aarto-Pesonen & Tynjälä 2017). On the other hand, it has been argued that the subjectivity of reflection can confuse both students and tutors in their self-evaluations (Koole et al. 2012).

2.3.4.4 The role of practice in physiotherapy education

Becoming a physiotherapist is a process of cultural learning with the aim of growing as a member of a community of practice (Wenger 1999; Lindquist et al. 2006b; Piirainen & Viitanen 2010; Chipchase et al. 2012; Roessger 2013; Greenfield et al. 2015; Gard et al. 2016), where professional identity and expertise grow in real work situations (Lähteenmäki 2005; Laitinen-Väänänen 2008). In physiotherapy training, professional development progresses in the contexts of school teaching, guided practical training and various projects in working life (Laitinen-Väänänen 2008; McMahon et al. 2014; Olsen et al. 2015; Dean & Lewis 2016; Gard & Dagis 2016; Korpi et al. 2017). In all countries, guided clinical training has been accepted as an integral part of the education of physiotherapy students and as an essential part of their preparation for professional practice. In Finland at least one-third of the education in physiotherapy programmes is implemented in authentic work contexts or with clients or patients (EQF 2008a, 2008b, 2017). Accordingly, there are lots of studies on physiotherapy students' acquiring of competence, skills and knowledge in clinical settings. According to Ericsson (2006), the development of expertise essentially requires deliberate, conscious, target-oriented and systematic learning, and well-structured practice (see also Ericsson et al. 1993). The clinical learning environment of physiotherapy education aims to develop clinical and professional skills to build up theoretical and practised knowledge and to socialise students within the professional practice community (Chipchase et al. 2012; Gard et al. 2016).

Self-reflection and self-evaluation are often a part of clinical training. Physiotherapy students' early experiences in clinical practice have been seen to develop students' critical thinking in addition to developing practical knowledge and preparing them for uncertainty and unpredictable contexts (Greenfield et al. 2015; Greenfield et al. 2017). Students' own activity, experiences, self-evaluation and self-reflection are central in the competence development process in practice (Gustafsson & Fagerberg 2004; Delany & Watkin 2009; Mann et al. 2009). The ability to reflect on one's own activity has been proven to be crucial to the attainment of clinical competence (see Richardson 1999a; Richardson 1999b; Lähteenmäki 2005; Laitinen-Väänänen 2008; Vågstol & Skoien 2011; Cruz et al. 2012; Boud et al. 2013; Maloney et al. 2013). In the study by Boud and colleagues (2013), students had difficulty to self-assess the level of their own clinical competence and they often "underestimated" it. Clinical educators experienced this as problematic and had trouble to guide students. In another study (Murphy et al. 2014), physiotherapy students used an assessment tool to evaluate their performance during clinical practice. These students experienced self-assessment to be feasible, it increased their understanding, and they received more specific feedback during all practical training sessions. Furthermore, the assessment tool helped clinical educators in guiding the students.

There is evidence that reflective writing facilitates students' reflective thinking and reflective skills (Tynjälä 2001; Glover & Sweet 2016; Ortoleva & Bétrancourt 2016; Sullivan & Czigler 2016). In the field of physiotherapy, reflective writing has been investigated mostly during practical training. Studies have shown that reflective journal writing helps physiotherapy students to analyse their feelings and consider how they handle different patient situations (Williams et al. 2002; Williams & Wessel 2004; Larin et al. 2005). Guided journal writing, in particular, helps students to avoid uncritical modelling in clinical practice (Constantinou & Kuys, 2013).

According to Mann and colleagues (2009) and also Gard and Dagis (2016), it is important that a clinical learning environment enables students to learn interaction and communication skills, thereby further strengthening their professional identity. Furthermore, communication is needed to develop students' reflective capacity as it is an essential characteristic of professional competence and also a way to integrate theory and practice. Bartlett and colleagues (2009) as well as Korpi and colleagues (2017) found, in their studies, that students' self-confidence and skill in dealing with their own stirred emotions when working with patients strengthened with practical training, and mostly during their first practical training period. Korpi and colleagues (2017) further argued that especially tacit and situational knowledge of the physiotherapy profession is developed in different work contexts.

Physiotherapy students' practical training is guided by clinical tutors. Physiotherapists who are clinical instructors are experienced as positive professional role models for students (Shepard et al. 1999; Öhman et al. 2002; Patton et al. 2013), and it is assumed that they have a great impact on students' learning and professional development. Accordingly, it has been emphasised that it is important for clinical instructors to continuously develop their own instruction competence (see, e.g., Holdsworth et al. 2016). Holdsworth and colleagues (2016) as well as Pabian and colleagues (2017) have stated that clinical instructors are in a responsible position to create a culture that optimises physiotherapy students' learning in practice. Acceptance in the clinical placement environment has also been found to be central to the quality of learning achievement, such as for developing a sense of trust and a balance between being supported and challenged (Vågstol & Skoien 2011).

The development of self-awareness, professional values and one's interprofessional role is part of the practical training. In the study by Grace & Trede (2013), students' self-awareness regarding their own values developed through clinical training. In studies by Rodger and colleagues (2005), Hallin and colleagues (2009), and also Davies and colleagues (2011), physiotherapy students' own awareness of their interprofessional role and the importance of collaborative work advanced during practical training.

Moreover, physiotherapy students need practical experiences that are long enough to develop their competences, self-reflection, self-evaluation and interprofessional collaboration. Shields & Taylor (2014) found that

physiotherapy students' self-assessment of professional behaviours had improved after ten weeks of community-based training.

3 AIM OF THE STUDY

The purpose of this study was to investigate, from different perspectives, how physiotherapy students describe their competence and its development during their physiotherapy education. The research considered the whole educational path of students, from the very beginning of their studies to their graduation. In more detail, the following specific research questions were set:

1. What kinds of conceptions of skill do beginning physiotherapy students have? (Study I)

2. How do physiotherapy students experience reflective writing as a tool for learning in their education? (Study II)

3. How do graduating physiotherapy students perceive their competence? (Study III)

4. How do graduating physiotherapy students describe their professional competence development during their education? (Study IV)

4 METHODOLOGY

A qualitative research approach was applied in this study. The research questions 1–3 were examined with the phenomenographic methodology, whereas a narrative approach was used for examining research question 4. The phenomenographic method is a data-driven research approach focusing on research participants' experiences, understanding or conception regarding a particular phenomenon (e.g., Marton & Pong 2005; Åkerlind 2005, 2012, 2018; Marton & Booth 2009).

The following sections firstly the participants of the study and the data collection methods. After that, the phenomenographic and narrative data analyses are described in detail.

4.1 Participants

For the research of this dissertation, four separate studies were conducted. The participants of the first study were 35 physiotherapy students (26 female, 9 male; age ranges 19–35 years).

Good ethical principles are used in this dissertation (Silverman 2011; Patton 2015). All students (n=40) who started the Bachelor's degree level physiotherapy studies at a Finnish university of applied sciences in 2009 were invited, on their second day, to participate in the research, and were informed about the main purpose and general nature of the study as well as the option to withdraw from the study at any time. 35 of the students confirmed their willingness to participate in the study by giving their signed informed consent (16 August 2009). The university of applied sciences granted the permission for the implementation of the whole study process, consisting of four separate studies (3 August 2009). Anonymity and strict confidentiality have been maintained throughout the whole process and the reporting of the findings (Silverman 2011; Patton 2015).

All participants (n=35), in this study, had passed the matriculation examination at the end of their upper secondary education. Six of them had already gained a higher education degree or a vocational degree earlier on, and three had dropped out of their earlier higher education studies. The majority of the participants had gained some kind of work experience before starting their university studies, mainly in the form of summer jobs or a profession, but none of the participants had worked in the field of physiotherapy before. Eight of the participants, however, had gained work experience in fields related to physiotherapy, such as having worked as an assistant nurse, massage therapist or rehabilitation assistant. Two of the participants in this follow up study quit their physiotherapy studies in the first year.

In the second study, 32 students participated, and in the third and fourth study 33 final-year physiotherapy students took part. Of the 32 participants, seven were men and 25 women and of the 33 participants, seven were men and 26 women. At the end of their studies, these students were between 22–37 years old (average = 24.7 years) and had studied 2.5–4.5 years. Eight participants had partly trained or studied abroad, either as international exchange students at a university or in clinical placements.

In the pedagogy of the study programme, the main idea was to encourage an investigative and evidence-based approach to learning in students, so that they develop themselves as an active, independent and self-regulative actor of their own learning process and build their expert knowledge by integrating theory and practice, with teachers and clinical supervisors as facilitators and supporters. The studies consist of theory studies and practical training (70 credits) at school and in clinical placements. Four supervised practical training periods (8–13 credits), two in the second year and two across the third or fourth year, were carried out in accordance with the students' personal learning plan and career plan in various workplaces and projects in the field. Previous education and competence may have sped up some students' graduation.

4.2 Data collection methods

Physiotherapy students' understanding of their competence and its development was studied by analysing written essays and documented interviews. The data of Study I were collected by essay writing at the beginning of their physiotherapy education, and of studies II–IV by interviewing the students in the last few/two months of their studies regarding their experiences (Table 1).

In the first study, concerning students' conceptions of their skills, we decided to explore the feasibility of essay writing to gather data, since writing has been proven to be an effective functional tool for reflection and learning (Tynjälä et al. 2001; Langer & Applebee 2007), and because reflective writing is used as a learning method in physiotherapy education. Åkerlind (2005, 2008) emphasises that essays can be a funtionally useful expressive medium through

which individuals can report their conceptions (Marton & Booth 2009). Additionally, essay writing was the fastest suitable way to get information about students' conceptions and to collect relevant data at the beginning of their studies. The research data were gathered during the two first weeks of the participants' physiotherapy studies, because our aim was to examine beginning students' conceptions of their skills before they had studied physiotherapy. The students (n=35) were asked to write an essay, 1–2 pages, on their own skills. The idea was that students' writings on their skills would reflect their general skill conceptions.

The data of Studies II (students' experiences of reflective writing), III (students' conceptions of their competence) and IV (students' narratives about their development) were collected by semi-structured interviews with the graduating physiotherapy students before their graduation, during the last month of their studies (Marton & Booth, 1997).

The interviews were carried out by the author of this report. At the beginning of the interviews, the students were requested to talk about their life and study process in response to the question: "Tell me, what has happened since you started your studies?" The open interview approach was intended to stimulate and encourage students to freely describe their life experiences, the study process and professional development throughout their university education. During the interviews, they were encouraged to elaborate on their experiences in order to ensure that the students would focus sufficiently on their skills, competences and professional development. For example, specific questions pertaining to writing were asked. Typical clarifying questions were: "Can you give an example of […]?" or, "Could you tell me more about […]?" The individual interviews, which lasted from 19 to 43 minutes, were audio recorded and transcribed verbatim. The resulting data consists of 159 A4-pages (font = Times New Roman 12, spacing = 1.5).

The analytic methods are described in detail in the next chapter.

4.3 Qualitative analytic methods applied in the studies

The data of Studies I–III were analysed with the phenomenographic method, whereas the narrative analysis was used in Study IV. Both of the research approaches can be used to examine how research participants experience or understand something and to reveal the common elements, variations and critical aspects of these experiences (Ricouer 1984; Bruner 1987; Polkinghorne 1995; Marton & Pong 2005; Åkerlind 2012, 2018). In this dissertation, the focus was on students' experiences and understanding of their competence development during their studies. In the following chapters, I first introduce the phenomenography research approach, after which I describe how the narrative analysis was used in this dissertation.

4.3.1 Phenomenographic data analysis

Phenomenography emerged as a new and innovative approach to qualitative research in the late 1970s (e.g., Marton & Säljö 1976). The epistemology and ontology of the phenomenographic method were clarified throughout the 1990s (Uljens 1996; Marton 1981; Marton & Pong 2005). Phenomenography has been continuing to grow in popularity, especially as an educational research method (Tight 2016).

Phenomenography is the study of how people experience and understand different phenomena. Marton and Booth (1997) proposed "that awareness of a phenomenon occurs through the experience of variation in the particular phenomenon". They continue, "those different patterns of awareness and lack of awareness of component parts of a phenomenon lead to different ways of experiencing or understanding the phenomenon as a whole." The purpose of the phenomenograpic study is to reveal the variation in participants' experiences of understanding. The outcome of phenomenographic research is a compilation of categories of description that illustrate the variation of conceptions and experiences in the population under investigation (Marton 1981; Uljens 1996; Marton & Pong 2005; Åkerlind 2005, 2017).

In our analysis in Studies I, II and III, we followed the principles presented in phenomenographic literature (Uljens 1996; Marton 1994; Marton & Pong, 2005; Åkerlind 2008). The analysis was carried out by three researchers (cf. Bowden & Green 2010). In Study I, the first phase of the analysis focused on identifying and describing the participants' conceptions of skill in the general terms of their overall meaning. First, I read the essays thoroughly, several times, in order to get familiar with the contents of the essays and to distinguish between the different kinds of conceptions. Next, the conceptions expressed in the essays were grouped into meaningful clusters, tentatively, according to their differences and similarities. After that, I formed the first draft of qualitatively different categories. Thereafter, all three authors collaborated to elaborate the categories based on the selected quotations until all categories were established and named.

In the second phase of the analytic process, the relations and hierarchies between the categories were determined by identifying what are referred to as *themes of variation,* that is, the themes that differentiate the categories. This was also done in collaboration between the three researchers. In this phase, some final modifications were made to the categories. Finally, the descriptions of the categories were developed and agreed on by the three researchers. To sum up, the categories mainly emerged in the first phase of the analysis, whereas the themes of variation emerged during the second phase of the analytic process. However, to a certain extent, these two phases of the analysis overlapped.

In line with phenomenographic principles (Marton & Pong 2005; Åkerlind 2008; Marton & Booth 2009), the descriptive categories do not represent individual students but relate to the variation in the students' conceptions identified in the collective research data. In other words, the categories describe

students' conceptions on the collective level (Marton & Booth 2009, 124–128). This means that, in Study I, the set of categories describe all possible skill conceptions in the overall data and that individuals may have expressed more than one conception. The categories have a structural and logical relation to each other and form a hierarchical whole (Marton & Pong 2005; Åkerlind 2008; Marton & Booth 2009). This means that the categories are nested and inclusive, so that the categories higher in the hierarchy may include categories that also appear lower in the hierarchy but not vice versa. Due to the hierarchical nature of the categories, some conceptions of skill can be regarded as more complete or complex than others (Åkerlind 2005, 2018).

Recent phenomenographic studies have identified pedagogically critical aspects in students' conceptions and experiences. These aspects are usually some of the themes of variation, and they are critical in regard to changing conceptions and moving from a less developed understanding to a more developed one (Åkerlind 2018).

The data in Study II were similarly analysed using a phenomenographic approach. In Study II, we examined how physiotherapy students experienced reflective writing as a learning tool in their education. The analysis of Study II was carried out by its three authors in two main phases, in a similar way as in Study I. The first phase of our analysis focused on identifying and describing the participants' experiences of reflective writing in general terms. The second phase of the analysis focused on examining the structural relationships between the descriptive categories.

Study III similarly followed the phenomenographic method. In Study III, the phenomenographic method was used to explore differences in students' conceptions of the nature of their physiotherapy competence. As in Studies I and II, the phenomenographic analysis in Study III followed the principles presented in the field's literature (e.g., Lincoln & Guba 2003; Bowden 2005; Marton & Pong 2005; Åkerlind 2012).

4.3.2 Narrative inquiry data analysis

Telling stories is a significant way in which individuals construct and express meaning. Narrative inquiry is a group of qualitative research approaches using stories to describe human action. According to Polkinghorne (1995), people organise their experiences in the form of a narrative to construct their identity. Narrative inquiry forms the experiences, events and happenings into a temporal and context-bound whole by means of a plot. In other words, the narrative method enables one to understand human existence as a dynamic process of emplotment and the specific explicit outcome is a story (Ricouer 1984, 1991; Polkinghorne 1995).

In the narrative inquiry approach, it is important to distinguish between the analysis of narratives and narrative analysis (Bruner 1987; Polkinghorne 1995, 6–8). In the analysis of narratives or "paradigmatic-type narrative inquiry" (Bruner 1987), the researchers collect data in the form of stories and analyse them, searching for themes among the stories (Polkinghorne 1995).

Researchers can determine and classify individuals' phenomenological conceptualisations through their analysis of narratives; in other words, they can shape "taxonomies and categories out of the common elements across the database" (Bruner 1987; Polkinghorne 1995). Narrative analysis or "narrative-type narrative inquiry" (Bruner 1987), on the other hand, means that through the analysis of data, such as interviews, a story can be perceived (Polkinghorne 1995).

The narrative methodology was selected to guide study IV as the purpose of the study was to examine how graduating physiotherapy students describe their physiotherapy development during their education, and a natural way to collect data on this was by asking the students to tell the story of their educational path from the beginning of their studies to their graduation. Similarly, it was natural to form narratives from these stories. Thus, in study IV, it was possible to combine students' life stories of their professional development in the physiotherapy education context. The narrative analysis approach enables identifying important transitions and turning points during students' studies (e.g., Ricouer 1984; Bruner 1987).

In Study IV, the focus was on students' interviews regarding their professional competence development in the physiotherapy education context. A three-stage analysis of the data of students' interviews was conducted. The first stage involved gaining a general overview, and descriptions of the data of professional development were made. In the next phase, the turning points of the stories were identified, and after that the story models were determined. A story model is a model of combined individual stories with similarities, formed from the research participants' narratives (Ricouer 1984). Thus, the analysis featured configuration and synthesis in order to produce explanatory stories as a result of the analysis process. In this emplotment process, the researcher is looking for connections between meanings and influence among the events and identified occurrences that contributed to the outcome (Polkinghorne 1995; Ricouer 1984). Moreover, the plot is chronologically organised from the beginning to the end of the narratives (see Ricouer 1984; Labov 1997). According to Riessman (2008, 11–14), a good narrative analysis prompts the reader to think beyond the surface of a text and involves broader commentary. Particularities and context take on a form and stories act as social artefacts describing certain cultures (Riessman 2008, 11–14). In Study IV, students' stories and experiences of professional development pertain to the context of physiotherapy education. The data collection and analytic methods of the study are summarised in Table 1.

TABLE 1 Data collection and analytic methods.

	Data collection time	Data collection method	Analytic method
Study I: Students' conceptions of skill	At the Beginning; 2009	Essays *n*=35	Phenomenography
Study II: Students' experiences of reflective writing	At the end; 2011–2014	Interview *n*=32	Phenomenography
Study III: Students' conceptions of competence	At the end; 2011–2014	Interview *n*=33	Phenomenography
Study IV: Students' professional competence development	At the end; 2011–2014	Interview *n*=33	Narrative analysis

5 RESULTS

5.1 Physiotherapy students' conceptions of skill at the beginning of their Bachelor studies (Study I)

Physiotherapy students' conceptions of skill could be grouped into four categories: (I) Skills as talents; (II) Skills requiring individual practice; (III) Skills requiring social practice; and (IV) Competence requiring collaboration. Seven themes of variation were identified and named: acquisition, emotions, motivation, reflection, evaluation, agency, and social environment (Table 2).

In the first category, skills were seen as talents. This conception often emerged in statements describing skills related to music, sports, technical fields, and social life. The acquisition of talents was seen as genetic and talents were regarded as constant. Thus, the possibility of learning through practice was seen to be limited, based on the belief that skills either exist or not. Emotions related to this category varied from gratefulness for having a talent to disappointment for lacking a particular talent. The roles of motivation, reflection, agency and the social environment were not recognised. In this category, students self-evaluated only their own skills.

While the first category denies the role of training in the acquisition of skills, the other three categories describe the students' ways of understanding skill development as the transformation of innate talents to skills requiring individual practice (category II), practising with developmental feedback from others (category III), or continuous maintaining and monitoring in collaboration (category IV). In those categories, the emotional dimension and the descriptions of the role of motivation, reflection, evaluation, agency and social environments widened and deepened from those of category I. The findings of Study I, that is, the categories of description and the themes of variation, are summarised in Table 2.

TABLE 2 Physiotherapy students' conceptions of skill at the beginning of their studies.

	CATEGORIES			
THEMES/ THEMES OF VARIATION	**I Talents**	**II Skills requiring individual practice**	**III Skills requiring social practice**	**IV Competence requiring collaboration**
Acquisition	Inborn, genetic	Gradual individual practice	Practice and developmental feedback	Continuous maintaining and monitoring in collaboration
Emotions	Thankfulness vs. disappointment	Excitement and/or satisfaction vs. disappointment	Good mood vs. disappointment	Appreciation and respect vs. disappointment
Motivation	Non-significant	Personal goal	Common goal	Collective goal
Reflection	Non-significant	Self-reflection	Co-reflection	Social reflection
Evaluation	Talent recognition	Self-evaluation	Peer-evaluation	Collaborative evaluation
Agency	Passive individual agency	Active individual agency	Team agency	Responsibility in communal agency
Social environment	Non-significant	Non-significant	As mirror, or as competition	Collaboration

From a pedagogical point of view, two critical aspects could be identified (Figure 3). The first one is the role of training, which appears between categories I and II, where the emphasis on the ways of acquiring skill shifts from individual practice to practising in groups.

The second critical aspect is the role of the social environment, which functioned either as a mirror or a motivator in the form of competition in category III. The social environment gave meaning to and provided a target for collaboration, and it was the most significant aspect in category IV. The pedagogically critical aspects of Study I are illustrated in Figure 3.

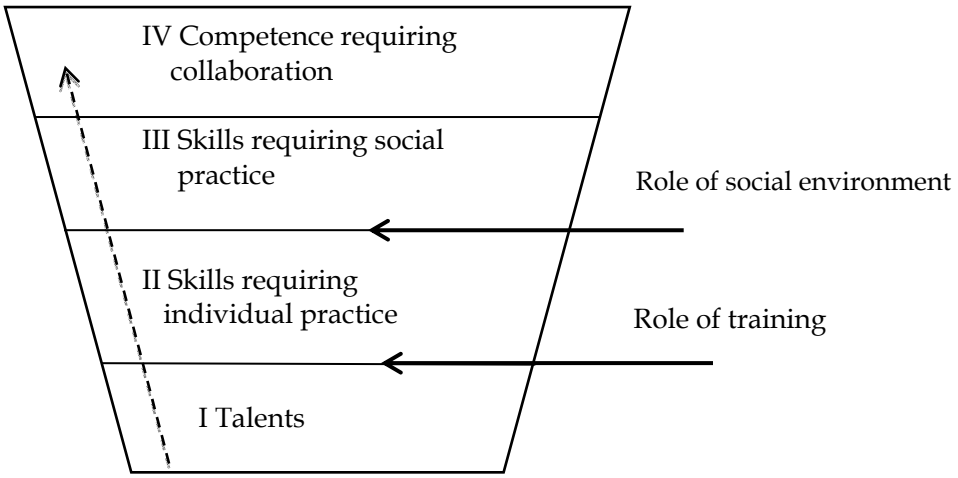


FIGURE 3 Physiotherapy students' conceptions of skill and the critical aspects defining the most important lines between the categories.

5.2 Students' experiences of reflective writing as a tool for learning in physiotherapy education (Study II)

The second research question focused on physiotherapy students' experiences of reflective writing and how it is connected to their professional development. This study showed that students had wide-ranging experiences and conceptions of reflective writing. The findings revealed four qualitatively different ways of experiencing reflective writing as a tool for learning: 1) writing as a useless task; 2) writing as a tool for deepening understanding; 3) writing as a tool for self-reflection; and 4) writing as a tool for professional development. The hierarchical categories were discerned from each other on the basis of six themes of variation that were named as follows: function of writing, focus of reflection, contribution to professional learning, emotions, main attribute of writing, and importance for learning. The formed categories and their distinctive features, that is, the themes of variation, are summarised in Table 3.

TABLE 3 Physiotherapy students' experiences of reflective writing.

THEMES/ THEMES OF VARIATION	**CATEGORIES**			
	I Writing as a useless task	II Writing as a tool for deepening understanding	III Writing as a tool for self-reflection	IV Writing as a tool for professional development
Function of writing	Extra task	Develops thinking and understanding	Deepens self-reflection and self-competence	Strengthens professional identity
Focus of reflection	Not discussed	Own action	Own action and interaction	Professional community
Contribution to professional learning	Not recognised	Development of thinking	Personal growth	Personal and social development
Emotions	Negative	Shift from negative to positive	Positive	Positive, flow
Main attribute of writing	Difficult, obligatory	Pleasant	Enlightening	Empowering
Importance for learning	Useless	Useful	Useful	Necessary

In the first category, reflective writing was seen as a useless and "extra" task. The students did not see any function in writing or any importance for learning in physiotherapy education. These students felt it was easier to explain their thoughts orally as they perceived writing as difficult and obligatory. Their emotions were negative because they felt that writing caused extra pressure and they felt forced to write. Instead of applying self-reflection, these students called for feedback from their physiotherapy instructor.

In the next category, writing as a tool for deepening understanding, the function of writing was seen as deepening understanding and clarifying thinking. It was perceived as useful for learning and brought new and expanding perspectives, and it helped students to connect theory with practice. It helped them analyse their own experiences and actions. Emotional charges shifted from negative to positive, even though these students still found writing to be a strain, but the strain was experienced as encouraging.

In the third category, writing as a tool for self-reflection, physiotherapy students described that it was useful and interesting to open up and analyse their work by writing. These students felt that reflective writing deepened their self-understanding during their studies. Writing was experienced as useful for

learning and the development of critical thinking, and they found it pleasant. The contribution of reflective writing to professional learning was seen as physiotherapy students' personal growth both during their studies and for when they would become practitioners in the future.

The final category, writing as a tool for professional development, addressed students' experiences of writing as a way to develop their professional competence and identity. Reflective writing was used as a tool for social, professional and identity development. The students' focus of reflection was on their interaction with the professional community during their education. Writing was experienced as positive and even more as an empowering activity, even as an enlightening experience. In sum, reflective writing was seen to be necessary for learning physiotherapy.

In relation to the themes of variation, three pedagogically critical aspects could be discerned: function of writing, emotions, and focus of reflection (Figure 4). The first significant turning point in students' experiences seemed to occur between categories I and II, where the students' way of experiencing reflective writing changed from regarding writing as a useless, difficult and obligatory task to experiencing it as a tool for deepening their understanding. Here, the function of writing radically changed from something seen to be useless to something that was experienced as being conducive to physiotherapy learning. The emotions also appeared the strongest between the descriptive categories I and II. Many students described how their feelings about writing shifted from negative to positive during their studies, whereas others reported their emotions remaining either negative or positive toward writing throughout their education. The focus of reflection appeared strongest at the crossover point between categories III and IV, where the emphasis on writing as a way of learning shifted from self-reflection to a broader perspective on professional competence. In category IV, the focus of reflection further widened to social development and professional communities in the physiotherapy students' training places.

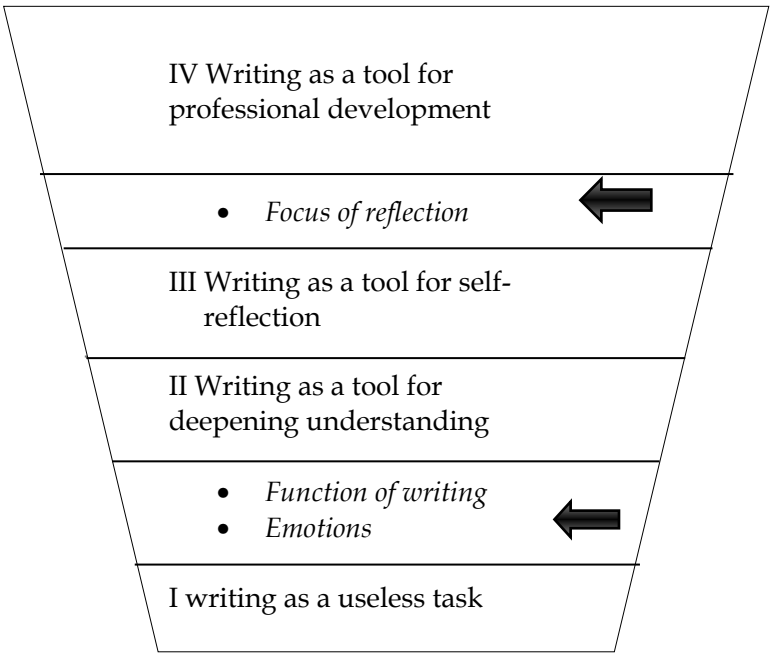


FIGURE 4 The descriptive categories of physiotherapy students' experiences of reflective writing and the pedagogically critical aspects from the viewpoint of moving from the lowest to the highest category in the phenomenographic hierarchy.

5.3 Graduating physiotherapy students' conceptions of their own competence (Study III)

The research question in Study III asked how graduating physiotherapy students perceive their competence. The analysis produced four descriptive categories: 1) mastering core skills; 2) understanding the theoretical basis of physiotherapy; 3) having a holistic view of physiotherapy; and 4) engaging in and developing multi-professional collaboration. Regarding the aspects distinguishing between the categories, the themes of variation were named as follows: nature of competence, communication, knowledge acquisition, focus of reflection, emotions, cultural awareness, and professional agency (Table 4).

The view of competence as mastering core skills, in the first category, often emerged in students' statements describing their own individual skills, actions and development, as well as in regard to their negative emotions, their own way of communicating, the importance of understanding patient data and knowing other cultures, and focusing on their skill development and growing as a person.

In the second category, physiotherapy competence was seen as understanding the theoretical basis of physiotherapy. Students justified treatments, corrected patients' knowledge and motivated them by using theoretical arguments. Students were searching for evidence-based data to

support physiotherapy planning. The focus of reflection included considerations regarding their interaction with patients. Self-reflection helped them to draw conclusions, solve problems and make decisions in patient situations. Positive emotional experiences dominated, that is, students coped with their emotions, controlled their feelings and fears, and their awareness of their own body and feelings developed further. New situations were experienced as emotionally heavy or worrying but also rewarding. They compared other cultures' physiotherapy treatments with Finnish ones. Students had strong and wide-ranging theoretical knowledge and the ability to apply it in physiotherapy practice, although they seemed to need more practical training in applying theory to practice.

In the third category, the students described their competence as involving a holistic view of physiotherapy. The students felt that the human body is a complicated whole, where the physical, social and psychological aspects of functioning interact. They pointed out skills to observe, plan and treat patients using complicated processes, the competence to assess patients' development and progress, and the effectiveness of treatments. These students co-operated with their patients and relatives, and they dealt with emotions professionally. The active, systematic and broadened search for theoretical knowledge based on evidence was seen to enhance their holistic professional competence. They described reflection as focusing on the whole physiotherapy process. The students showed cultural awareness by comparing Finnish physiotherapy with the approaches taken in other cultures. Their professional agency appeared in their concern regarding ethical principles and they were interested in evaluating and developing physiotherapy practices.

In the fourth category, engaging in and developing multi-professional collaboration, students felt that they had sufficient boundary-crossing competence to plan for and instruct patients and athletes in collaboration with other professionals from different organisations and societies. They were active in multi-professional teamwork with nurses, doctors, insurance companies and coaches. They described their knowledge acquisition as participation in multi-professional documentation and conducting evidence-based research. Their reflection focused on multi-professional rehabilitation programmes and organisations. These students still found reflection challenging because every organisation has its own treatment tradition, for example. They discussed their feelings and emotions in collaboration with their peer students, colleagues and other professionals. Regarding their cultural awareness, the students pondered different social and health care approaches. Their agency broadened, evaluating different social and health care systems as well as guidelines for treating different diseases.

TABLE 4 Graduating physiotherapy students' conceptions of their own competence.

THEMES/ THEMES OF VARIATION	**CATEGORIES physiotherapy competences as:**			
	I Mastering core skills	II Understanding the theoretical basis of physiotherapy	III Having a holistic view of physiotherapy	IV Engaging in and developing multi-professional collaboration
Nature of competence	Individual skills	Theoretical bases for different skills	Integrated competence	Boundary-crossing competence
Communi-cation	My way to communicate	Understanding patients' communication	Co-operation	Multi-professional collaboration
Knowledge acquisition	Patient data	Evidence-based data (for patients' physiotherapy)	Evidence-based data for developing professional PT	Evidence-based data for multi-professional collaboration
Focus of reflection	Own skills and actions	Interaction with patients	Whole physiotherapy process	Organisations, multi-professional rehabilitation
Emotions	Negative emotions dominate	Coping with emotions	Dealing with emotions with a professional attitude	Dealing with emotions professionally and collaboratively
Cultural awareness	Knowing other cultures	Comparing cultural differences	Widening one's own cultural concept of PT	Ruminating over different social and health care approaches
Profes-sional agency	Focusing on one's own skill development and growing as a person	Application of theoretical knowledge in practice	Evaluating and developing PT practices	Evaluating different social and health care systems

PT Physiotherapist

From a pedagogical point of view, four critical aspects can be identified: focus of reflection, professional agency, cultural awareness, and communication (Figure 5). These significant aspects are critical from the perspective of supporting students to understand professional competence in a broader sense. The focus of reflection expanded from the physiotherapy students' own skills and actions in category I to the interaction with patients in category II, and developed further to include the whole physiotherapy process as well as multi-professional collaboration with various organisations and rehabilitation professionals in categories III and IV. Professional agency expanded from the individual aspects of professional competence toward reflection on and participation in social and system-wide practices. The role of communication and experiences of understanding patient communication emerged within category II, where the students turned descriptions of their own communication into accounts of experiences of having an empathic understanding of patients' communication and respecting their feelings, sensations and individual life situations. The fourth critical pedagogical aspect, cultural awareness, emerged between categories III and IV. Developing awareness of other cultures by training in a multicultural environment or by studying abroad through international exchange programmes at foreign universities or in clinical placements was seen to be important in this regard.

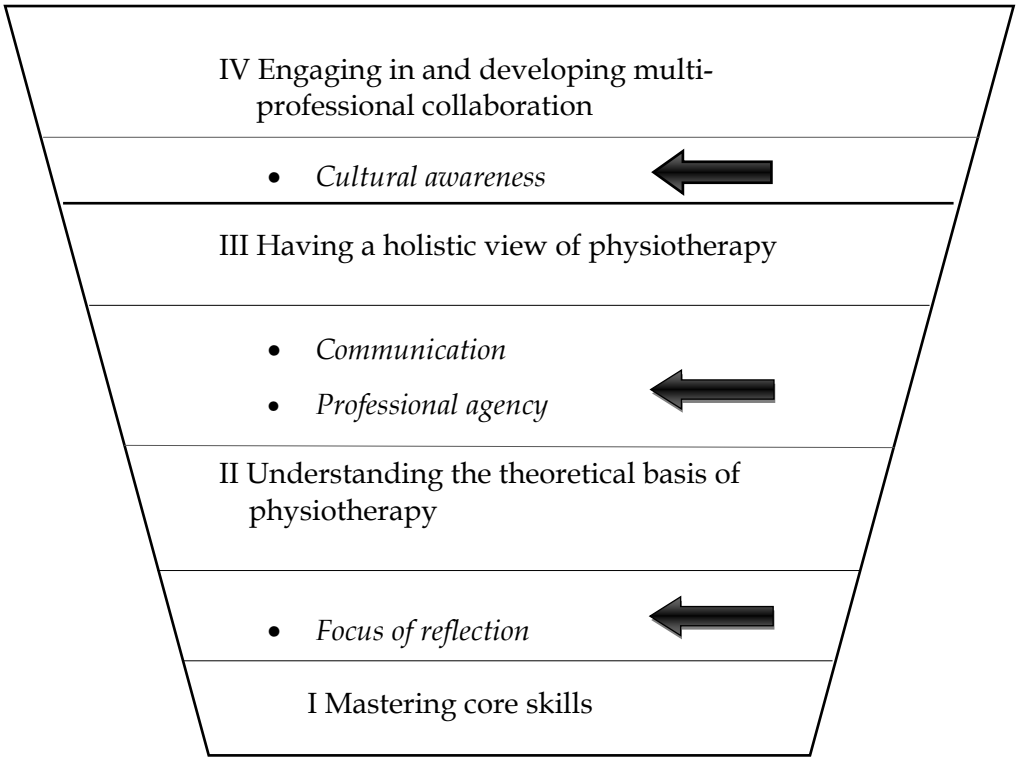


FIGURE 5 The descriptive categories of graduating physiotherapy students' conceptions of their own competence and the pedagogically critical aspects from the viewpoint of moving from the lowest to the highest category in the phenomenographic hierarchy.

5.4 Stories of professional development in physiotherapy education (Study IV)

The earlier studies (I-III) are synthesised in the fourth study, resulting in five story models describing physiotherapy students' learning and professional progression that proceeded through various phases and turning points during their education. The main focus of the narration in the first story model (I) was the development of mastering core skills, the second (II), that of understanding the theoretical basis of physiotherapy, the third (III), that of a holistic view of physiotherapy, the fourth (IV), that of active and collaborative ways to become a critical developer, and the fifth (V), that of target-oriented and socially responsible progress on the highway to becoming an expert. In their stories, the students described different turning points that illustrated critical or particularly meaningful episodes or periods during the process of their professional development to be a physiotherapist. Seven different turning points were identified and were named as follows: getting a study place, quitting something formerly important, coincidental changes, practical training periods, international exchanges, linking theory and practice, and getting a job or preparing to look for a job (Table 5).

In the first story model (I), *the arduous path to mastering core skills*, the professional development of the graduating students was characterised by low motivation, poor self-esteem and the arduous progress of their studies. Active support and tutoring by the teacher during the last year was experienced as important in helping the students to graduate as a physiotherapist. Students felt that they had learned the basics of physiotherapy and developed far enough professionally that they would be able to work in certain physiotherapy sectors. Coincidental life changes throughout the study programme were experienced by the students as turning points in their professional development.

Students in the second story model (II), *developing an understanding of the theoretical basis of physiotherapy*, experienced their professional development as forming a strong theoretical knowledge base but requiring more practical training. Coincidental life changes appeared as turning points and affected these students' professional development. Linking theory lessons and practical training significantly advanced their competences. They were able to reflect on and understand the theoretical basis of physiotherapy, which encouraged them in working with patients and clients. The practical training periods, especially in the last half year, were clear turning points. Most of the students were ready to take on the professional role of a physiotherapist.

The third story model (III), *towards the holistic view of physiotherapy*, was characterised by experiences of self-regulation, good motivation, and responsibility. Students felt that they had acquired an understanding of the coherent whole of physiotherapy. The physiotherapy studies played an important role in their life, and, because of this, they had quit something else that was also important in their life (e.g., competitive sports). These decisions

increased the students' commitment to the study programme. Starting to work with "real" clients and patients during the practical training periods was experienced as significant. The supervisor's co-operation and co-reflection during the practical training were reported as the most important part of their professional development. That had increased their self-confidence and they felt ready to work as a competent physiotherapist. The four long (8–13 credits) practical training periods were clear turning points in these stories.

In the fourth story model (IV), *active and collaborative ways to become a critical developer*, graduating students characterised their professional role as active and critical. Clinical educators' constructive feedback and critical co-reflection strengthened students' professional identity. Most of them managed to get a job directly after graduating. In students' professional development, the turning points were: getting a study place, quitting something important in their life to properly invest more in their own education, and the supervisors' encouragement of students to make their own clinical decisions, conclusions and arguments involved in problem solving during practical training periods, as well as, for some students, their international experiences.

Finally, in the fifth story model (V), *target-oriented and socially responsible progress on the highway to becoming an expert*, the professional development of the students was characterised by strong goal orientation, high motivation and critical studying of physiotherapy. Students planned the direction of their own learning progress and chose their practical training places to achieve their own goals in their professional development. They wanted to gain a lot of experience and develop their competences in specifically chosen organisations. They were analytical and self-reflective, considering the whole field of physiotherapy. Students' ambition was to graduate as a clinical developer, feeling ready to face challenges and wanting to continue their lifelong learning. All students gained work in physiotherapy right after graduating. The practical training periods in workplaces, which the students themselves could choose, and getting a job were clear turning points.

From a pedagogical point of view, two important features appeared: firstly, the importance of connecting theory and practice, and, secondly, the role of supervisors.

The turning points in students' stories that illustrated the most meaningful episodes during their physiotherapy education are presented in Table 5.

TABLE 5 Turning points of the story models.

Turning points	**Story models**				
	I	**II**	**III**	**IV**	**V**
Coincidental changes in students' own life during their education. Mostly experienced as negative, but at times also positive.	x	x			
Linking theory and practice.		x			x
Practical training periods ensuring the acquisition of skills and competences in physiotherapy.		x	x	x	x
Quitting something formerly important in life to properly invest in studying physiotherapy.			x	x	
Getting a study place after short- or long-term planning.				x	
International exchanges confirmed the students' professional choice to study physiotherapy.				x	
Getting a job or preparing to look for a job as a professional physiotherapist.					x

I The arduous path to mastering core skills

II Developing an understanding of the theoretical basis of physiotherapy

III Towards the holistic view of physiotherapy

IV Active and collaborative ways to become a critical developer

V Target-oriented and socially responsible progress on the highway to becoming an expert

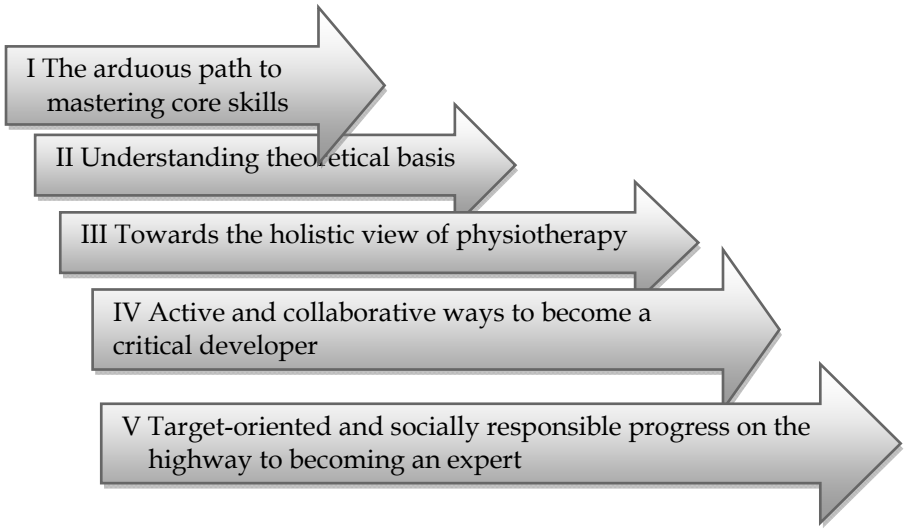
6 DISCUSSION

6.1 A brief overview of the key findings and their pedagogical implications

The findings of the dissertation form a holistic picture of physiotherapy students' professional competence development during their education and can be used as background material in planning how to support students' learning and thus also in developing curricula. The four studies of the dissertation concentrated to the students' point of view how they conceptualized their own development to become a professional.

The Study I illustrates the starting situation of how students understand one important element of physiotherapy competence – skill – at the beginning of their education, whereas the Study III broadens the perspective more holistic understanding of students' own competence at the end of education. Study IV, in turn, focuses on the whole path of students' competence development during their studies. Study II focuses on one central pedagogical element of physiotherapy education, reflective writing, and on how students experience the role of this pedagogical practice in their competence development. The main findings of the dissertation are summarized in Table 6.

TABLE 6 Summary of the research results.

Studies (I-IV)	Qualitative categories			
(I) Students' skill conceptions at the beginning of their studies	Talents	Skills requiring individual practice	Skills requiring social practice	Competence requiring collaboration
(II) Students' experiences of reflective writing during the physiotherapy programme	A useless task	Tools for deepening understanding	Tools for self-reflection	Tools for professional development
(III) Students' perceived competence at the end of their studies	Mastering core skills	Understanding the theoretical basics of physiotherapy	Having a holistic view of physiotherapy	Engaging in and developing multi-professional collaboration
(IV) Student's stories of professional development				

In the upper row of the table 6, students' skill categories at the beginning of their education are presented, and in the middle row the students' experiences of reflective writing during the physiotherapy programme are described. The students' conceptions of their professional competence at the end of their studies are presented in the third row. Moreover, story models related to students' professional development are indicated by the five arrows at the bottom of the table.

At the beginning of physiotherapy studies students had a variety of conceptions about skills, ranging from perceiving them as inborn talents to regarding them as competences requiring collaboration (Study I). From a pedagogical point of view, two critical aspects could be identified: the role of training, and the role of the social environment. The findings suggest that it is important to discuss skill development at the beginning of physiotherapy studies and to emphasise the importance of training and use learning methods that encourage social interaction and multi-directional feedback. The findings can be used in planning physiotherapy curricula, especially for designing skill-oriented education and training, and for supporting students along their educational path, especially by offering opportunities for students to reflect on their skill conceptions. Ultimately, physiotherapy students' awareness of different skill conceptions and their developing their counselling and treatment skills will benefit patients.

At the end of studies physiotherapy students' experiences of their competences vary (Study III). While some students saw their competence as mastering single core skills, others regarded themselves as active partners engaging in and developing multi-professional collaboration. An interesting challenge for physiotherapy education is how teachers, tutors and clinical educators could support physiotherapy students so that all graduating students would be closer to category IV, involving multi-professional collaboration.

From a pedagogical point of view, four critical aspects were identified: focus of reflection, professional agency, communication, and cultural awareness. It is important to convince students of the value of reflecting both at the individual and collective level during their physiotherapy studies. The aim is to move the focus of reflection from students' personal issues toward social and multi-professional collaboration along with their professional development during their studies. According to other research reports, it is typical that, at the early stage of professional development, reflection is focused on oneself and later on more on social aspects (cf., Aarto-Pesonen & Tynjälä 2017). Students' reflection can be guided with learning tasks, such as the learning diary method and group discussions that support reflection on different foci. The different levels of competence identified in this study could be utilised in physiotherapists' self-evaluation and self-assessment. One possibility is to evaluate physiotherapists' collaborative competence in physiotherapy departments. Furthermore, in-service physiotherapists could evaluate and reflect on their own competence in the particular work task, project or organisation, for example.

Professional agency expanded from the individual aspects of professional competence toward reflection on and participation in social and system-wide practices. This kind of transformation can be induced by providing students with opportunities for collaboration and multi-professional work already in university and in practical training. Due to the critical contribution of these activities to students' learning, clinical educators should be encouraged to facilitate students' participation and acceptance within a workplace.

The role of communication expanded from an individual way of communicating to understanding patient communication and being able to cope in challenging situations, as well as to co-operating in multi-professional collaborations. Training with simulated patient interaction may increase students' confidence in communicating with patients of all kinds. It is important that clinical educators and teachers co-reflect with students on their communication style and give timely feedback in practical training.

Cultural awareness, the fourth critical aspect, widened from knowing other cultures to comparing cultural differences, and further to reflecting on different physiotherapy and other social and health care approaches. Pedagogically, it is important that students gain a broad understanding of cultural differences and are able to compare their own circumstances with those of clients from other cultures. Altogether, becoming a physiotherapist is a process of cultural learning with the aim of growing as a member of a community of practice.

With the narrative approach, the Study IV looked at physiotherapy students' path from the beginning of their studies at university of applied sciences to their graduation. The students' stories of professional development with different turning points revealed issues where education could particularly be a positive influence, such as regarding practical training, linking theory and practice, and international exchanges. On the other hand, also those turning points and issues emerged in the results that education could hardly affect, that is, quitting something formerly important in life and coincidental changes in students' lives. Nevertheless, it is important that teachers and clinical educators take these aspects into consideration to advance and help students' professional development. It would be important to develop clinical supervisors' ability to utilise diverse learning tools, such as videos and reflective journals supporting students' learning and connection making of theoretical and practical knowledge. The integrative pedagogy model (e.g., Tynjälä et al. 2016) could be a valuable framework for planning learning situations and environments.

Reflective writing has been widely utilized as an essential element in physiotherapy education and many studies have shown its positive effect on learning and professional development (cf. Breuer et al. 2016; Glover & Sweet 2016; Ortoleva & Bétrancourt 2016; Sullivan & Czigler 2016). The Study II showed that students experience writing as a tool for learning in physiotherapy education in different ways. Three pedagogically critical aspects could be discerned: the function of writing, emotions, and focus of reflection. For the function of writing, it is important to convince students of the value of writing from the very beginning of their studies. This could be done, for example, by presenting them with quotations from more advanced students who had positive experiences, emotions and attitudes. For effective learning results, it is important to give support in writing-to-learn (WTL) activities, especially for those students who experience negative feelings. In order to decrease anxiety, especially at the beginning of their studies, students should be encouraged to

practise free-style writing, so that they can gain experiences of writing without the fear of linguistic mistakes or failure. At the same time, there are other students who require more challenging and complex writing assignments. This requires flexible and individual practices and tutoring in education.

In this dissertation, something that is of potential importance but was not yet investigated is how the students' conceptions of skill, experiences of reflective writing, and the conceptions of their own competence relate together. Based on the findings in this dissertation, it could be presumed that these elements were connected to each other in certain ways, considering the story models. It seems that story model V, *Target-oriented and socially responsible progress on the highway to becoming an expert,* reflects the conceptions of those students who, at the beginning of their studies, had versatile conceptions of skill and how to learn skills, and more so than others, these students saw reflective writing as a diverse tool for learning and experiencing professional learning more deeply.

6.2 Theoretical conclusions of the study

A central starting point of the study was the multidimensional nature of competence, illustrated in the views of competence by Eraut (1998), in the theory of competence by Mulder (2011) and in the conceptual model by Ellström (1997), and as elaborated in this study in the form of a general model of competence in physiotherapy (Figure 1). The general model proposed in this study represents different elements of competence in physiotherapy. All of the various elements were treated within the theoretical framework: the first element, formal and officially demanded competence, was discussed from the perspective of legislation concerning both physiotherapy education and the physiotherapist as a professional, whereas the three other perspectives, context-related competence, behavioural competence, and integrative professional competence were examined in empirical studies of this dissertation.

Tynjälä and Gijbels (2012) emphasise that, in high-level professional expertise, the basic components of expertise (i.e., conceptual, experiential, self-regulative and socio-cultural knowledge) are tightly integrated into a whole. In this view, knowledge and skills cannot be separated from each other in professional competence but are deeply interrelated and integrated. Similarly, the elements of competence in physiotherapy, that is, formal and officially demanded competence, context-related competence, integrative competence and behavioural competence are integrated together (Figure 1).

Context-related competence appeared in several ways in the study findings. The importance of practical training and an authentic work context became emphasised. In particular, it is interesting that those students whose professional development stories were classified as fitting the fifth story model were aware that learning contexts and work contexts could be different, and that the specific kind of training place could advance their professional

development. For this reason, they wanted to choose their practical training places themselves so as to ensure that they can proceed according to their own career plan. These students were also aware that the development of professional competence in physiotherapy is a long process and that they need to be active and plan their studies and learning right from the beginning of their education. In general, the great importance of practical training for the students' professional development arose in the findings (cf., Korpi et al. 2017). The significance of practical training appeared in all of the story models except in story model I, and was the strongest in story model V, *Target-oriented and socially responsible progress on the highway to becoming an expert*. In the present study, it was found that, during practical training, it is important to practise various professional skills (cf., Lindquist et al. 2010; Cruz et al. 2012) and create explicit connections between theory and practice (cf., Olsen et al. 2015). These findings support the model of integrative pedagogy (Tynjälä et al. 2016) and are in line with studies on expertise that have shown that acquiring and developing skills and competences requires a lot of experiences and repetition (e.g., Ericsson 2006; Parviainen & Aromaa 2015).

In this study, the story models revealed that the pathways of physiotherapy students' professional development and the learning processes involved in becoming a physiotherapist differ. Similar findings have been reported in other studies (cf., Korpi et al. 2014). Lindquist and colleagues (2010) pointed out students' preference for a learning process that takes place within a realistic context involving patients and other physiotherapists. The present Study IV considered the whole professional development process, and the students were found to have different competences, competence levels, abilities and motivations for learning. The story model V showed that students had decided on their career path as a physiotherapist on their own.

Behavioural competence includes communication and collaboration with clients and patients. According to the present study findings, the role of communication expanded from an individual way of communicating to understanding patient communication and coping in challenging situations, and further on to co-operation in multi-professional collaboration. In the literature, multi-professional collaboration and development together with other health and social professionals, voluntary organisations' workers and adapted physical educators as well as assistive technology professionals is seen as important in supporting diverse professional development while advancing patients' life quality and managing at home (Lachmann et al. 2013; King et al. 2016). It has also proved that multi-professional collaboration has to start at the beginning of physiotherapy studies at university in order for students to have enough time to develop and practise collaboration (Kuukkanen & Hynynen 2016).

Furthermore, physiotherapists need collaborative skills to help and guide patients and clients to use assistive devices. Technology can, as part of physiotherapy, support elderly people in managing at home, or physiotherapists can use distance technology in motivating patients and clients,

for example. Students did not emphasise the use of technology in learning, even though they were taking online courses at university as well as used digital devises and virtual programmes during practical training and in international exchanges.

Integrative professional competence includes the holistic and integrated whole of physiotherapy knowledge, skills and attitudes. After acquiring theoretical understanding and basic skills, students with such competence have enough self-confidence to start to train in clinical practices and work in various work communities with various professionals and multi-professional teams (cf., Kerry 2017).

The present dissertation findings showed that the students' ontological perspective of physiotherapy has been shaped mostly by the holistic approach. According to the holistic view, body and mind are understood as an integral part of a consistent whole and a human being is seen as an active and independent agent of her or his own action (cf., Broberg et al. 2003; Wikström-Grotell et al. 2013; Gard & Skjaerven 2018; Thornquist 2018).

The hint of the humanistic approach, where the nature of the body is described with the concept of embodiment, was found in competence category IV, *Engaging in and developing multi-professional collaboration* and in the story model V, *Target-oriented and socially responsible progress on the highway to becoming an expert.* In this approach, psychological, social, cultural, geographical and economic dimensions of health and illness are taken into consideration. The field of physiotherapy is special because the embodiment approach strongly features the interaction between the patient and physiotherapist as a ''bodily meeting'', where the physiotherapist takes special responsibility for how the body is understood and thematised (Piirainen 2006). Furthermore, the roles of knowledge and interaction are incorporated through the body into physiotherapy practice (cf., Gyllensten et al. 2010; Mehling et al. 2011; Bjorbækmo & Shaw 2018; Thornquist 2018). This approach creates possibilities for growth in the physiotherapy profession (Nicholls & Gibson 2010) and it can advance professional development already during students' physiotherapy education in university. Figure 6 illustrates four developmental themes that seem to emerge when exploring the findings of all studies comprising this dissertation. These developmental themes—emotions, reflection, context, and cultural awareness—are both empirically and theoretically grounded.

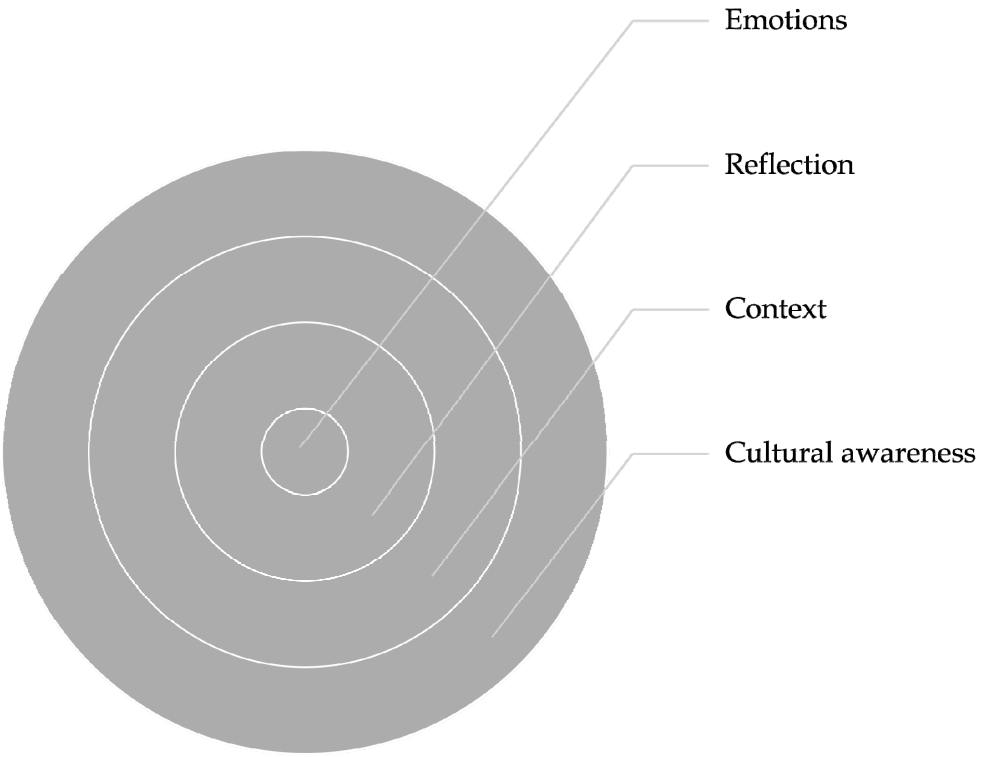


FIGURE 6 Developmental themes.

The first of the developmental themes is *emotions*. Emotions came up in all of the descriptive categories of students' conceptions of skill and competence from the beginning to the end of their physiotherapy education, as well in the categories of experiences of reflective writing. Emotions varied and were found to be a part of one's own competence development. Some of the students felt a negative dominance of emotions while others felt able to cope with their strong emotions during their education. Some of the students were handling their emotions with a professional attitude, that is, they were aware of the implication of the emotions for their patients' physiotherapy and recovery, for example, while others identified their own and patients' emotions as a way of dealing with the emotions professionally and collaboratively. Students were aware of the implication of their emotions for their professional development. In the present study, students' ability to deal with their awakened emotions when working with patients strengthened in pursuance of their self-confidence and the advancing development of their skills (cf., Bartlett et al. 2009; Ruitenberg & Towle 2015; Korpi et al. 2017). Students experienced strong emotions in dealing with difficult patient situations and with patients with serious illness, for example. According to Malinen (2000), that kind of affliction (pain) in learning, such as strong emotions seen in this study, could produce a breach (in Finnish "särö"), which has been found to further learning and professional development if properly reflected upon.

In the chapter discussing the ontological view of physiotherapy, it was found that the holistic view of physiotherapy gives attention to both body and

mind where emotions were noticed. The present dissertation findings showed that students' ontological perspective of physiotherapy was shaped mostly by the holistic approach, which was found in category III, *Having a holistic view of physiotherapy,* and in story models III and IV, *Holistic view of physiotherapy* (III) and *Collaborative ways to become a critical developer* (IV). Students reflected on their emotions, recognising their feelings, understanding their relevance and meaning, and elaborating them concerning their communication with patients and in multi-professional collaborations, for example. Bjorbækmo & Shaw (2018) have pointed out that living in one's body unreflectively may result in regarding one's own body in an objectified mode, alienated from oneself. The basis of physiotherapy education should be the humanistic approach, where the nature of the body is described with the concept of embodiment instead of a separation between body and mind (cf., Piirainen 2006; Nicholls & Gibson 2010). In this dissertation, students' humanistic view emerged in competence category IV, *Engaging in and developing multi-professional collaboration* and in story model V, *Target-oriented and socially responsible progress on the highway to becoming an expert*. Learning and practising in order to be a physiotherapist and developing your own professional competence presumes developing one's own embodied knowledge, that is, the physiotherapist considering her or his own relation to the world (cf., Bjorbækmo & Shaw 2018). That is why the role of emotions is depicted as the core or deepest level of the developmental themes outlined in Figure 6.

The second developmental theme that could be discerned on the basis of this research is *reflection*. Students' conceptions and understanding regarding their own skills, competences and reflective writing, as well as their professional development stories, were found to always involve varied reflection; this was the case at the beginning of the students' physiotherapy education as well as during and at the end of it. The importance of the role of reflection was discovered at the very beginning of the students' studies when they were required to reflect on their conceptions of skill. The students' ways of reflecting appeared in the form of self-reflection regarding their own actions in category I, critical reflection together with others in category II, and social reflection as an ability to find solutions to problems together with other people in category III.

According to the dissertation findings, students showed divergent competence in reflection also at the end of their education. The students' focus of reflection varied from targeting their own actions and specific patient treatments to considering the whole physiotherapy process in categories I–III, and further on also considered multi-professional rehabilitation and collaboration with organisations in category IV. The demanding patient circumstances and different standpoints of treatments as well as the involvement of other physiotherapists or doctors, for example, facilitated students' reflective processes and led them to perceived personal and professional insight as well as having yielded a deeper appreciation for reflection. The students' stories suggest that the supervisors' own ability to

reflect, create dialogue and generate argumentation supporting their decisions affected how the supervisors challenged students to learn critically and develop their professional skills. However, students experienced a need for support and encouragement in addition to suitable learning tools to practice reflection and advance their focus of reflection toward multi-professional collaboration and system-wide practices. Furthermore, learning to reflect on one's own actions, to co-reflect in interaction, and to collaboratively reflect in interprofessional environments were understood as important for one's professional development and learning (cf., Korpi et al. 2014; Pullon et al. 2016). This study highlights that reflecting on multi-professional rehabilitation and collaboration with seems to also advance physiotherapy students toward collaboratively reflecting on their own emotions (cf., Lachmann et al. 2013). Students need to understand the meaning of reflection and should ideally practise reflection from the beginning of their physiotherapy education.

In the physiotherapy profession, as well as in other health professions, writing competence is a basic requirement (e.g., Breuer et al. 2016) because all patient data must be documented and documents need to be based on critical professional reasoning, analytical synthesising and procedures (Erickson et al. 2008; Wainwright et al. 2010). Furthermore, writing has been seen as an important tool for developing self-regulative knowledge (e.g., Tynjälä & Gijbels 2012; Breuer et al. 2016), facilitating reflective thinking and making it possible to explicate tacit knowledge and conceptualise experiences (e.g., Glover & Sweet 2016; Ortoleva & Bétrancourt 2016; Sullivan & Czigler 2016). Most often, in order to bring about development through reflection, students' reflection is guided using learning tasks such as group discussions and reflective writing tasks (e.g., Breuer et al. 2016; Maroux et al. 2016). Reflective writing was used as such a task in the present study's physiotherapy students' education. During practical training periods, students trained in self-reflection with patients, co-reflection with the clinical educator, and collaborative reflection with the other professionals, and the training was provided with the guidance of clinical tutors and teachers as well as a guiding learning diary in a learning task during the first practical training period.

In the present dissertation, some students experienced writing to be an effective tool for deepening understanding and helping to think critically, while others understood it as a way to develop self-reflection or viewed it as a tool for professional development. However, some students experienced writing as an 'extra' task and useless for learning; they preferred to reflect by talking about their own experiences and feelings with another physiotherapist. At its best, reflective writing was felt to be a positive, flowing and empowering tool for professional development, in this study (see also Breuer et al. 2016; Glover & Sweet 2016; Ortoleva & Bétrancourt 2016; Sullivan & Czigler 2016). Furthermore, writing reflectively could prevent uncritical modelling in clinical placements (cf., Constantinou & Kuys 2013) and help students to analyse their feelings and consider how they will handle different patient situations in the future (cf., Williams et al. 2002; Williams & Wessel 2004; Larin et al. 2005), and also to give

them opportunities to influence their self-reflection to overcome their negative feelings in order to see the benefits of writing as witnessed in this study.

The third developmental theme emerging from the study results was that of *context*. The context within which clinical learning occurs plays an important role in achieving meaningful learning experiences. The role of the context typically related to practical training places and theory education involving different kinds of training at university. Students, in this study, experienced that understanding the theoretical basis of physiotherapy and practising at university with peer students with the support and guidance of teachers before practical training periods encouraged them to work with 'real' patients and clients in workplaces and advanced their professional development. Moreover, the students worked and practised in different workplaces, communities and environments and with various physiotherapists and other professionals, seeking to gain a greater understanding about themselves and how to utilise a reflective framework in their own development.

In the present study, the multi-dimensional social and health care context with varied learning environments, atmospheres, practices, and conventions such as professional roles, tasks and problem-solving situations created a learning foundation upon which students' professional development became concrete. Students expressed that engaging in and developing multi-professional collaborations in practice was advancing their co-reflection skills and professional development (cf., Piirainen & Viitanen 2010). Furthermore, multi-professional collaboration has been found to help students to collaboratively reflect on their own emotions (Lachmann et al. 2013).

The importance of practical training was highlighted in all of the students' story models, except for story model I, where the most significant role was the guidance of the tutor or teacher. Moreover, in the present study, the appearance of more and more demanding patients and their relatives or networks with multiple problems, as well as the expectation of enabling a higher quality of life, both challenged and advanced students' professional development (cf., Murto et al. 2017; Probst & Skjaerven 2018).

In the present study, the fourth developmental theme was that of *cultural awareness*. As a part of their physiotherapy education, the students had the opportunity to participate in international and intercultural contexts. In this study, both international exchanges in practical training places and studying theoretical subjects at different universities, besides experiencing multi-culturalism in the home country, strengthened several students' learning and professional development. Furthermore, students' cultural awareness seemed to broaden through critical reflection on their own conceptions of physiotherapy, and it increased students' confidence in their own competence, professional identity and autonomy. At the same time, the practice and operations models as well as the scientific basis for treatments in different countries became clearer. Students can believe in stereotypes or myths, which can cause misunderstandings regarding physiotherapy practices in other countries such as with respect to the role of clients and patients in

physiotherapy (Fougner & Horntvedt 2012; Mostert-Wentzel et al. 2013; Wickford 2014). All in all, becoming a physiotherapist is a process of cultural learning with the aim of growing as a member of a community.

Nowadays, becoming a health professional as a physiotherapist, according to this study's findings, requires knowledge, core skills and tremendous reflection and emotional sensibility as well as a good understanding of the theoretical basis of physiotherapy, the humanistic approach of physiotherapy, and engagement and development in multi-professional collaborations in the field of health and social care. By learning to fulfil these requirements, students develop professional agency, appropriate behaviours and attitudes, effective ways of professional thinking, and how to reflect on and practice their skills, thereby realising their dream to develop along their learning path (cf., Barradel et al. 2018).

6.3 Methodological reflections and considerations

This qualitative study also has limitations. Samples for qualitative studies are generally much smaller than those used in quantitative studies. Likewise, the main limitation of this dissertation is the small sample (n=33–35), although a whole group of physiotherapy students was examined during their studies. Thirty-five of the 40 physiotherapy students at the beginning and 33 students at the end of their studies participated in research. For a qualitative study, this number of participants enabled catching the main variations of students' conceptions of skill and competence as well as their experiences of reflective writing and professional development. In fact, some earlier qualitative studies have found that the saturation point can be as small as 11 participants (Mason 2010; Täks 2015, 48–49, see also Kettunen & Tynjälä 2018). As a qualitative analysis carries on, a further accumulation of more participants and data does not necessarily reveal more information. At the same time, typical for qualitative research, a small data set makes it possible to go deeper in terms of understanding the phenomenon. Furthermore, all occurrences of a single piece of data are potentially useful, because qualitative research is concerned with understanding and meaning rather than generalising or testing a hypothesis. A small qualitative sample can even consume more time than a larger quantitative one, because phenomenographical and narrative analyses require intensive work (Mason 2010).

Another limitation, related to the previous one, is the fact that the research was conducted in only one discipline. However, I believe that the findings can also be of relevance to other fields of higher education, especially the fields of other health and medical sciences. Also, the limitations of this dissertation relate to the context of only one country, Finland. This research was carried out in the Finnish context, relating to Finland's specific culture and its educational system of universities of applied sciences and physiotherapy teachers' training there. Therefore, further research is needed to examine students' and teachers'

conceptions of competence and the stories of their professional development in different cultures, education systems, fields and professions.

An initial limitation relevant to this dissertation was the English language. However, in conjunction with intensive work with my research team and an excellent proofreader, I believe that text of my dissertational report expresses the detailed and clear impression that I wanted to achieve, despite English not being my mother tongue.

In this dissertation, something that was not investigated was how the conceptions of skill at the beginning of the students' studies related to their experiences of reflective writing during and competence conceptions later on in their education; hence, this could be an interesting topic for a future study.

In the most phenomenographic and narrative studies, the data on students' conceptions are gathered through interviews (Marton & Pong 2005; Åkerlind 2005, 2008; Marton & Booth 2009). In this dissertation, I decided to collect the data both through interviews and essay writing. In Study I, concerning students' conceptions of skill, I used essay writing as it has been proven to be a useful functional tool for reflection and learning (Tynjälä et al. 2001) and because it is seen as a feasible data collection method in phenomenographic studies. In Study II about experiences of reflective writing and in Study III regarding graduating students' conceptions of their competence, interviews on these respective matters are featured that were conducted at the end of the students' education. Both essay writing and interviews proved to be workable methods for gathering data for these purposes.

One factor of the trustworthiness of a qualitative study is the dependability of the research, analogous to external validity (Lincoln & Guba 2003). The reader must feel convinced that the research process is logical, traceable and clearly documented (Kettunen & Tynjälä 2018). Conducting research as a group is regarded as a factor that strengthens the rigour of the whole research process (Bowden 2005; Bowden & Green 2010; Kettunen & Tynjälä 2018). Three of the four studies forming this dissertation used the phenomenographic analysis method, conducted by one and the same research group. Two of the members had a lot of experience using the phenomenographic method in their previous studies (e.g., Paakkari et al. 2010; Jäppinen et al. 2017; Töytäri et al. 2016; Ahola et al. 2017; Kettunen & Tynjälä 2018; Holopainen et al. 2018). I, as a novice researcher, learned and developed with my expert colleagues throughout the analysis process. When analysing the data and forming descriptive categories as a research group, these colleagues helped me gain more insights from the data (see Bowden 2005; Bowden & Green 2010) and to document the categories clearly. Collier-Reed and his colleagues (2009) point to the importance of ensuring the dependability of phenomenographic research by clearly documenting the processes of the construction of the descriptive categories. The analysis process as a whole must be documented as explicitly as possible (Kettunen & Tynjälä 2018). Consequently, the analytic processes were described in detail in each of the

studies forming this report. In research, it must be demonstrated that the findings emerged from the data step by step, that is, confirmability is required, analogous to objectivity, according to Lincoln and Guba (2003), and empirical trustworthiness must be evidenced (Kettunen & Tynjälä 2018). To describe the findings, I used demonstrative excerpts from transcripts as well as illustrative tables and figures to show readers how the results emerged from the data (Kettunen & Tynjälä 2018).

During all phases of the whole dissertation process, I had to consider how to guarantee the trustworthiness of the process (Bowden 2005), especially because of my dual role as a researcher and physiotherapy lecturer. I also work as a developer and a tutor teacher in the physiotherapy education programme in which this study took place. I was constantly striving for objectivity in every phase of the doctoral dissertation process. Writing diary and working with research group during the dissertation process helped me to critically reflect and be all the time aware and alienate from my other roles and concentrate to the studies as a researcher.

First of all, the importance of clarifying the aims and keeping them in mind throughout the process is important (Bowden 2005). I wanted to investigate the development of the students' conceptions of their skills, competences and professional growth across the duration of my research covering their physiotherapy education. I wished to gain knowledge that could be used to develop physiotherapy students' education and practical training, and to enable updating the curriculum in order to support preparing the physiotherapy profession for the unknown future.

Throughout the study process, I tried to take my preconceptions about the phenomenon into account and set them aside as far as possible (see Bowden & Green 2010), that is, I tried to become sensitive to my own subjectivity. During the interviews, I had to be aware of my dual role as a researcher and physiotherapy teacher. All of the participating students were aware of my profession as a teacher. Nevertheless, it is difficult to say whether my role as a teacher had some influence on the physiotherapy students, especially regarding their willingness to participate in my dissertation and with respect to their responses in the interviews. The participating students wrote their essay in the first two weeks of their physiotherapy education, at which time the influence of my dual role was surely more limited than later on and the students had only met me twice. I believe that, because the students knew me, it may have been easier for them to discuss the phenomenon of research during their education and that it may have made the atmosphere more comfortable. Moreover, as such, I could elaborate on their answers more deeply and my probing helped the students to express their conceptions and experiences in their own words as well as to clarify their meaning. Sometimes the students asked me some questions about education and learning and wanted to know more. Nevertheless, I do not think that my dual role made the students answer in a particular way.

According to Lincoln and Guba (2003), transferability is part of research trustworthiness, analogous to external validity. By trustworthiness, they mean that the findings are also "applicable in other contexts or with other participants". In any case, the contextual specificity of phenomenographic studies is important to realise (Kettunen & Tynjälä 2018). The findings of this dissertation could be applicable, in some ways, also to other students who study similar health-related subjects (such as chiropractic, nursing or surgery fields) where practical and manual skills play an important role in professional expertise.

The phenomenographic analyses produced three outcome spaces reflecting the students' understanding and conceptions of their skills, reflective writing as a learning tool, and their competence at the end of their physiotherapy education. Along with the principles of phenomenography (Åkerlind 2005, 2018; Marton & Pong 2005; Marton & Booth 2009), all of the category combinations were hierarchical in nature; the hierarchies emerged through the themes of variation and thus described students' widening understanding. The categories higher in the hierarchical structure describe a more complex and advanced understanding of the target phenomenon, while the lower categories in the hierarchy correspond to a lesser understanding of the same. The findings describe the understanding and voices of the students interviewed in this particular context (Bowden & Green 2010), the field of physiotherapy. The readers can critically consider the possibilities for applying the findings to potentially any other context (see Bowden & Green 2010).

In Study IV, narrative analysis was used to produce story models of the professional development of physiotherapy students. According to Labov (1997), there are some critical points concerning the trustworthiness of narrative analysis that should be considered in different phases of analysis, and thus also when reading the stories and turning points that emerged from the data of this study. These critical considerations are credibility, reportability, objectivity, causality and the assignment of praise and blame.

The credibility of an outcome of analysis must be demonstrated as explicitly as possible in its report. Reportability refers to how narratives are organised in a semantic and structural way, that is, the technique of reporting (Labov 1997). Furthermore, the researcher should report the events of analysed narratives as objective experiences without any reference to the story tellers. The transfer of experience, in this dissertation graduated students' experience, is always a subjective phenomenon and it is challenging to observe and measure it. That is why such stories are confirmed by theoretical arguments and discussed with several relevant sources (see also Loh 2013). In the present dissertation, no causal relationships between parts of the stories were searched for. Labov (1997) points out that the reflexivity of the researcher is important to ensure the valid interpretation of analysed results. Furthermore, according to Labov (1997), the researcher's understanding of the context, that is, where the narratives are produced and in this study the field of physiotherapy, helps to ensure a valid interpretation of the analysed results.

Similarly, Riessman (2008, 189–196) emphasises that critical reflection during the narrative analysis and on the results is necessary for the development of scientific knowledge. The trustworthiness of narrative research can be examined, for example, from a pragmatic point of view by evaluating whether the research results in question produce context-dependent knowledge. In other words, in the present dissertation, this means asking whether the findings have pragmatic value in the field of physiotherapy education (Riessman 2008, 189–196). As described earlier, in the case of this dissertation, the results have important pedagogical implications for the field of physiotherapy and physiotherapy education, and possibly for other fields of higher education as well. The various story models and the turning points in the physiotherapy students' stories suggest important implications for guidance processes and students' professional development toward becoming a physiotherapist.

6.4 Ethical issues

Good ethical principles were used during this dissertation and its four studies. The University of Applied Sciences, from which the data has been collected, granted the permission for the implementation of the entire research. I met the students personally and told them orally as well as in writing about the aims and purpose of this research. The participants' permissions were requested in writing. Participation in this study was voluntary.

The anonymity of the participants has been maintained throughout the study process and the scientific reporting (Silverman 2011; Patton 2015). Excerpts from relevant essays and interviews illustrate the key aspects pertaining to the participants. For quotes, only pseudonyms and code numbers with an indication of the gender of students were used. The students wrote their essay in Finnish and spoke Finnish in the interviews, and the quotes that I selected were translated into English at the end of the analysis process of each study. The first translation was undertaken by me and discussed with the other researchers, and finally proofread by a professional. The electronic data and material were stored on the hard drive of my own computer. The other material was kept in a locked cabinet. Once the last article is published, the data will be disposed of in a proper way.

Furthermore, this dissertation is a part of a wider research project that has research permission from the ethical committee of University of Jyväskylä (9.5.2012).

6.5 Challenges for future research

This research was carried out in the Finnish context, relating to Finland's specific culture and education system, and in particular to physiotherapy teachers' training in Finland. Further research is needed to examine physiotherapy students' professional development in different cultures and education systems, as well as in other fields and professions.

In particular, I recommend that the use of reflective writing be examined more systematically in the field of health education. For example, longitudinal research designs are needed to investigate the multi-professional students' co-operation and emotional dimensions of writing.

The students, particularly in story models III, IV and V, highlighted the critical role of supervisors in supporting their learning. The stories suggest that the clinical educators' own ability to create a safe atmosphere and dialogue, as well as to reflect and generate argumentation supporting their decisions and advice, affected how they challenged physiotherapy students to learn critically and develop their professional competence. Therefore, it would be interesting to analyse supervisors' reflection ability to advise and support students' own reflection, co-reflection or collaborative reflection. The students' stories show that coincidental changes in students' lives during their education affected their motivation and concentration. It would be challenging to investigate teachers' understanding regarding students' life changes and their negative and positive implications for the students' professional development.

Considering the importance of practical training and of linking theory with practice as suggested by the results of this study's research, it seems that it would be particularly effective to focus on strengthening the connection between theoretical learning and practical training in future research interventions.

Furthermore, it could be useful to conduct further research interventions that specifically focus on exploring what the relations are between competences and story models in professional development.

YHTEENVETO (FINNISH SUMMARY)

Näkökulmia fysioterapeuttiopiskelijoiden ammatillisen osaamisen kehittymiseen koulutuksen aikana

Fysioterapeuttikoulutuksessa ja sen kehittämisessä on tärkeä tutkia opiskelijoiden oppimista. Kuitenkaan fysioterapeuttiopiskelijoiden omia käsityksiä ja kokemuksia omista taidoistaan, osaamisestaan ja ammatillisesta kehittymisestään ei ole juurikaan tutkittu. Opiskelijoiden omien käsitysten ja toiminnan tunnistaminen sekä ymmärtäminen voi vaikuttaa positiivisesti heidän ammatilliseen kehittymiseensä sekä fysioterapiakoulutukseen ja tulevaisuudessa myös fysioterapeutin ammatillisen osaamisen tasoon.

Tämän väitöskirjatutkimuksen tarkoituksena oli tutkia eri näkökulmista, miten fysioterapeuttiopiskelijat ymmärtävät ja kokevat omat taitonsa, osaamisensa ja niiden kehittymisen koulutuksensa ja opiskelun aikana. Tutkimuksessa keskityttiin ammattikorkeakoulussa opiskelevien fysioterapeuttiopiskelijoiden (n=35) koko opiskeluajan ammatillisen kehittymisen polkuun aina opiskelun alusta valmistumiseen saakka. Opiskeluaika vaihteli 2.5 vuodesta 4.5 vuoteen.

Väitöskirjan neljän osatutkimuksen tutkimuskysymykset olivat seuraavat: 1) minkälaisia käsityksiä opiskelijoilla on taidosta opiskelunsa alussa, 2) miten opiskelijat kokevat reflektiivisen kirjoittamisen oppimisen välineenä koulutuksen aikana, 3) minkälaisia käsityksiä opiskelijoilla on omasta osaamisestaan valmistumisvaiheessa ja 4) miten opiskelijat kuvaavat ammatillisen osaamisensa kehittymistä koulutuksen aikana ja minkälaisia tarinamalleja opiskelijoiden kuvauksista voidaan identifioida.

Laadullista aineistoa (kirjalliset esseet ja avoimet haastattelut) kerättiin opiskelun alussa ja opiskelun lopussa. Aineiston analyysissä hyödynnettiin fenomenografista analyysiotetta (Tutkimukset I-III) ja narratiivista lähestymistapaa (Tutkimus IV).

Fenomenografisten analyysien tarkoituksena oli kartoittaa ja kuvata opiskelijoiden käsityksiä taidosta, osaamisesta ja reflektiivisestä kirjoittamisesta sekä niiden kehittymisestä. Analyyseissä muodostettiin kuvauskategorioita, jotka ovat hierarkkisessa suhteessa toisiinsa siten, että ylemmät kategoriat saattoivat sisältää aineksia alemmista kategorioista, mutta ei toisinpäin. Kategorioiden lisäksi tutkimuksessa identifioitiin variaation teemat, joiden avulla voitiin nimetä tekijät, joiden suhteen kategoriat erosivat toisistaan. Teemojen variaatioiden kautta voitiin myös konkretisoida kategorioiden väliset hierarkkisuudet. Nämä heijastavat kuvauskategorioissa taidon, osaamisen ja reflektiivisen kirjoittamisen käsitysten laajenemista siirryttäessä kategorioiden hierarkiassa.

Tulokset osoittivat, että opiskelijoilla oli opiskelun alussa useita erilaisia käsityksiä taidosta. Taidon käsityksistä muodostui hierarkkinen rakenne ja taidon käsityksiä kuvattiin neljän kategorian avulla. Taito ilmeni joko

lahjakkuutena (hierarkkisesti suppein kategoria), tai sen ajateltiin edellyttävän yksilöllistä harjoittelua, sosiaalista kanssakäymistä tai yhteistyötä muiden henkilöiden kanssa (hierarkiassa laajin kategoria).

Myös opiskelijoiden kokemukset reflektiivisestä kirjoittamisesta ilmenivät neljänä kuvauskategoriana. Kirjoittaminen tuli esiin hyödyttömänä tehtävänä (suppein kategoria), asioiden ymmärrystä syventävänä toimintana, itse-reflektion ja oppimisen välineenä tai ammatillisen kehittymisen välineenä (laajin kategoria). Opiskelijoilla oli laaja-alaiset käsitykset reflektiivisestä kirjoittamisesta, jota edellytetään koulutuksen aikana.

Opiskelijoiden oman osaamisen käsitykset valmistumisvaiheessa myös vaihtelivat ja muodostuvat neljästä kuvauskategoriasta. Osaaminen ilmeni ydintaitojen hallintana, fysioterapian teoreettisten perusteiden ymmärtämisenä, kokonaisvaltaisena käsityksenä fysioterapiasta tai sitoutumisena moniammatilliseen yhteistyöhön ja sen kehittämiseen.

Narratiivisessa analyysissä tutkittiin opiskelijoiden kertomuksia oman osaamisensa kehittymisestä ja opintojen etenemistä fysioterapia-opintojen alusta asti aina valmistumiseen saakka. Tutkimustuloksina muodostui viisi erilaista ammatillisen osaamisen kehittymisen tarinamallia: 1) vaivalloinen polku ydintaitojen hallintaan, 2) tie fysioterapian teoreettisten perusteiden ymmärtämiseen, 3) kohti holistista fysioterapiaa, 4) aktiivisesti ja yhteistyötä tehden kriittiseksi kehittäjäksi ja 5) tavoitteellisesti ja yhteistyössä kohti asiantuntijuutta.

Tarinamallit muodostuivat ammatillisen kehittymisen tekijöistä ja juonen erilaisista käännekohdista opiskelijoiden kehittymisen poluilla. Käännekohdat havainnollistivat kriittisiä ja erityisen merkityksellisiä tapahtumia ja episodeja opiskelijan ammatillisessa kehittymisessä.

Edellä kuvattujen tutkimustulosten yhteenvetona nousi esiin neljä keskeistä kehityksellistä teemaa, jotka olivat sekä empiirisesti että teoreettisesti perusteltavissa: tunteet, reflektio, konteksti ja kulttuurinen tietoisuus.

Tutkimustulokset antavat lisätietoa ja syventävät ymmärrystä opiskelijoiden ammatillisesta kehittymisestä korkeakouluopintojen aikana. Tuloksia voidaan hyödyntää fysioterapeuttiopiskelijoiden ammatillisen kehittymisen tukemisessa sekä osaamisen ja osaamisen tason syventämisessä ja laajentamisessa. Tänä päivänä terveysalan ammattilaiseksi kehittyminen edellyttää vahvaa fysioterapian teoreettisten perusteiden osaamista, ammatin ydintaitoja ja yleisiä työelämätaitoja, kriittistä reflektiotaitoa ja emotionaalista herkkyyttä sekä humanistista lähestymistapaa fysioterapiaan ja sitoutumista moniammatilliseen yhteistyöhön ja sen kehittämiseen terveys- ja sosiaalialalla sekä kulttuurista tietoisuutta. Opiskelun aikana opiskelijat etenevät kohti omaa unelmaansa, ammatillista osaajaa, eksperttiyttä oppimispolkuaan pitkin. Opiskelijoiden ammatillinen toimijuus ja asenteet sekä kriittinen reflektointi, miten arvioida, valita ja kehittää ammatillisia taitojaan ja miten toimia terapiatyössä sekä muissa vaativissa työelämän edellyttämissä tehtävissä kehittyvät erilaisissa konteksteissa. Näitä edellytyksiä jokainen ammattilainen tarvitsee vastatessaan tämän päivän ja tulevaisuuden haasteisiin.

Yhteenvetona voidaan todeta, että opiskelijoilla on erilaisia tavoitteita opiskelunsa suhteen ja he etenevät erilaisia polkuja pitkin valmistuakseen ammatillisiksi osaajiksi. Tulosten pohjalta voidaan ehdottaa, että opiskelijoiden erilaiset tarpeet opiskelun aikana ja sen etenemistä suunniteltaessa tulisi ottaa huomioon opiskelijoiden tutoroinnissa ja opetuksessa. Lisäksi teorian yhdistämistä käytäntöön kaikissa opiskeluvaiheissa sekä korkeakoulussa että erilaisten harjoittelujen aikana tulisi tukea. Erityistä huomiota tulisi kiinnittää opiskelijoiden työ- ja harjoittelupaikkojen valintaprosessin yksilölliseen etenemiseen ja ohjaavien fysioterapeuttien kriittisen reflektion syventämiseen.

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ORIGINAL PAPERS

I

PHYSIOTHERAPY STUDENTS' CONCEPTIONS OF SKILL AT THE BEGINNING OF THEIR BACHELOR STUDIES

by

Merja Kurunsaari, Arja Piirainen, and Päivi Tynjälä 2015

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ABSTRACT

Skills have recently received widespread attention in education policy documents and discussions. This article reports the results of research on Bachelor's degree physiotherapy students' conceptions of skill at the beginning of their studies. The aim of the present study was to examine how beginning students understand skill, and the focus was on conceptions of skill in general rather than on any particular skills. The participants of the study were 35 physiotherapy students. The data were gathered within the first two weeks of their university studies. Specifically requested essays written by the students were analyzed using the phenomenographic approach. The data-driven analysis yielded four descriptive categories which reflect the students' conceptions of skill: 1) *Talents*; 2) *Skills requiring individual practice*; 3) *Skills requiring social practice;* and 4) *Competence requiring collaboration*. The categories form a hierarchy. The differences between the categories are described along seven themes of variation. The themes were named: *Acquisition, Emotions, Motivation, Reflection, Evaluation, Agency,* and *Social Environment*. This hierarchical system of categories sheds new light on students' understanding of skill. The findings can be used as a basis for planning physiotherapy curricula, especially for designing skills education and training, and for supporting students along their educational path, especially in offering opportunities for students to reflect on their skill conceptions. Ultimately, physiotherapy students' awareness of different skill conceptions and developing their skills to best advise and treat their patients will benefit the patients.

Keywords: skill, competence, conceptions of skill, physiotherapy student, phenomenography

INTRODUCTION

Skills have recently received widespread attention in education policy documents and discussions. The OECD has recently conducted a feasibility study for measuring higher education learning outcomes, covering both domain-specific and generic skills (see, AHELO, 2013). According to the World Confederation of Physical Therapy (WCPT, 2011), the main focus of physiotherapy is “human movement and function.” Therefore, physiotherapy is a profession in which practical skills are highly valued. Field-specific recommendations and skill descriptions are issued in position papers, such as benchmark statements by the WCPT (2011), the European Region of the World Confederation for Physical Therapy (2008), and the European Network of Physiotherapy in Higher Education (2010). These documents consist of criteria and guidelines regarding the body of knowledge on physiotherapy and the core skills and competencies required by a qualified physiotherapist. It is stated that physiotherapists need to be able to communicate effectively with patients and other professionals in addition to assessing the functional capacity in patients and making treatments plan to deliver effective physiotherapy interventions (European Region of World Confederation for Physical Therapy, 2008, 2013). The European Commission has launched the European Qualifications Framework (EQF), specifying skill, knowledge and competences at different educational levels; and, on the basis of this framework, national qualification profiles have been developed in many countries (EQF, 2008).

Despite the wide interest in the development of physiotherapy skills, less attention has been paid to how “skill” itself is understood in education. In general, and in the context of physiotherapy in particular, there is a clear need to study and critically evaluate skills and how skills are understood. This is important for two reasons. First, the learning of skills is central in physiotherapy practice, but it has been studied mainly in the context of motor control (Carr and Shepherd, 1987; Schmidt, 1991). Second, we lack information on how physiotherapy students and teachers interpret the concept of “skill” and what they think about the learning of skills. This kind of knowledge would have important implications for educational and pedagogical planning and practices in the field of physiotherapy. Thus, the purpose of the present study was to examine physiotherapy students’ conceptions of

skill. Our study focused on conceptions of skill in general, not on any specific skills needed in the field of physiotherapy. We particularly interested in the first year students' conceptions at the very beginning of their studies.

How skill has been conceptualized

The concept of "skill" is broad and fairly undefined. It is a widely used word in daily conversation, but attempts to define it are challenging (e.g., Vallas, 1990). WHO has defined life skills as a group of interpersonal skills, cognitive skills, social skills and psychosocial competencies, that determine the ability to understand and use information in order to maintain good health (Bornman, 2004; WHO, 2003; WHO, 2013; WHO Regional Office for Europe, 2013). Life skills, according to Gronin (1996), include such daily living skills that are needed in personal self-care and in interaction with others. Terms such as skills, knowledge and competence have been used in different ways and there is an ongoing discussion as to how to best develop skills to a professional level (see Brockmann, Clarke, and Winch, 2008; Clarke, Winch, and Brockmann, 2013). In the field of physiotherapy, the WCPT (2013, 13) has defined physiotherapy skills as the ability to use field-specific knowledge and solve problems. In a similar vein, in the context of the European Qualification Framework (2008), skills are described as being "cognitive and practical." In everyday usage, the term "skill" is often used to describe something opposite to knowledge, or as something that completes knowledge, that is, as the application of knowledge into practice. From the scientific point of view, this kind of conception of skill is narrow.

In the scientific context, the concept of skill can be seen from three points of view, depending on traditions, that is, as *an ontological approach*, *an epistemological question,* or *a competence viewpoint*. The *ontological* perspective represents beliefs about the nature of human beings and human's relation to the world they experience (Lakoff and Johnson, 1999; Lakoff, 2012; Schlimm, 2013), the *epistemological* viewpoint examines the concept of skill in relation to the concept of knowledge (e.g., Anderson, 1983; Bereiter, 2002), and the *competence* orientation is a pragmatic approach to knowledge and skill and

examines skills as part of a system of qualifications acquired through education and training (EQF, 2008).

One example of the *ontological* perspective is the approach where skills are not treated as separate entities based on the distinction of body and mind, but are understood as an integral part of a consistent whole (Lakoff and Johnson, 1999; Lakoff, 2012; Schlimm, 2013). The practical *competence* orientation is represented in The European Qualification Framework (EQF, 2008), which defines skills, knowledge and competences on different education levels. In the *epistemological* tradition, the theoretical foundation of skill relates to expert knowledge. In the present study, our interest was mainly focused on the epistemological approach and we subsequently examined the components of expert knowledge in greater detail, as follows.

The forms of knowledge are traditionally divided into two basic categories: *declarative knowledge* and *procedural knowledge* (Anderson, 1983). The former can also be described as “know-that” and the latter as “know-how.” In this traditional dichotomy, “skill” belonged to the latter category. Often, a third component has been added to describe *metacognitive knowledge* (e.g., Bereiter, 2002; Eraut, 2004; Le Maistre and Parè, 2006), which is related to knowledge about one’s own knowing and thinking, or *strategic knowledge* (e.g., Eraut, 2004; Tynjälä, 2009), which refers to knowledge about the context and task at hand. Furthermore, some studies speak about *dispositional knowledge* (e.g., Billett, 2011), referring to “know-for,” that is, knowledge comprising values, attitudes, interests and beliefs.

Tynjälä (2009; see also Tynjälä and Gijbels, 2012) has summarized several accounts about expert knowledge (e.g., Anderson, 1983; Bereiter, 2002; Eraut, 2004) and presented a model including four basic components of professional expertise: 1) *Conceptual or theoretical knowledge;* 2) *Experiential or practical knowledge*; 3) *Self-regulative knowledge;* and 4) *Socio-cultural knowledge*. Conceptual knowledge includes declarative knowledge that is factual or theoretical in nature. This kind of knowledge is explicit and can therefore be learned from books, journals, lectures, discussions and so on. The second component of expertise, experiential or practical knowledge, finds its expression in skills and psychomotor knowledge, and is acquired mainly through practical experience. This procedural knowledge is often tacit and difficult, but not impossible, to express explicitly.)

(e.g., Bereiter, 2002; Eraut, 2004) For example, when a person learns psychomotor skills through bodily adaptation, this takes place mostly in a subcognitive way (see Bereiter, 2002, 144–145; Lakoff and Johnson, 1999; Lakoff, 2012). Practical or procedural knowledge can also be obtained in more explicit ways, for example, by reading a manual. The third element of expertise, regulative knowledge, consists of strategic and metacognitive skills and knowledge, and can be either implicit or explicit. Individuals use metacognition and self-regulative skills to evaluate their own activities and actions.

The three basic types of knowledge described above (conceptual, experiential and self-regulative) represent personal, individual knowledge (Bereiter, 2002; Eraut, 2004; Tynjälä, 2009), while the fourth component of expertise is comprised of socio-cultural knowledge. This form of knowledge is embedded in the practices and environments of social communities and can be experienced only through participation in these communities and by using the devices and tools that they provide (Bereiter, 2002, 158–159; Eraut, 2004, 215; Tynjälä, 2009; Wenger, 1999).

Tynjälä and Gijbels (2012) emphasize that although these four basic elements of expertise can be discerned analytically, they are far from separate entities, being tightly integrated into a whole. In this view, knowledge and skills cannot be separated from each other in professional competence but are deeply interrelated and integrated.

In the field of physiotherapy, interest in the *ontological* approach has been widening in recent years and more evidence has been presented regarding the multidimensional and complex nature of physiotherapy (Lindquist, Engardt, and Richardson, 2010; Skjearven, Kristoffersen, and Gard, 2008; Wikström-Grotell and Eriksson, 2012). This change of focus can be described as a paradigm shift as the ontology of physiotherapy described in earlier studies was mainly based on the traditional biomedical approach (e.g., Lindqvist et al., 2006). Increasingly, researchers and practitioners have also begun to pay attention to the *competence* perspective, in other words, how physiotherapy students acquire generic and professional skills for qualification. These studies have focused, for example, on interprofessional skills (e.g., Hallin, Kiessling, Waldner, and Henriksson, 2009; Rodger, Mickan, Marinac, and Woodyatt, 2005), clinical reasoning skills, and manual skills (e.g., Hendrick, Bond, Duncan, and Hale, 2009; Phillips, Barnard, Mullee, and Hurley, 2009).)

While the ontological and competence approaches have gained ground in physiotherapy research, less research has been conducted from the epistemological perspective. Especially research focusing on expertise in the field of physiotherapy is narrow (Boekhout, van Gog, van de Wiel, Gerards-Last, and Geraets, 2010; Piirainen and Viitanen, 2010). Some studies have focused on how physiotherapy students acquire regulative knowledge, such as reflective and critical thinking skills, in practice (e.g., Bartlett and Cox, 2002; Clouder and Toms, 2008; Cole and Wessel, 2008; Donaghy and Morss, 2007; Roche and Coote, 2008), whereas only Le Maistre and Parè (2006, 107) have attempted to present a holistic model of expert knowledge in the field of physiotherapy. They interviewed final year students, as well as freshly graduated newcomers in their first two years at work and their experienced colleagues in four professions, including physiotherapy. Based on their findings, they presented a typology of professional identity divided into two main components: professional knowledge and personal knowledge. The first main category, *professional knowledge,* is comprised of content knowledge, procedural knowledge and knowledge about the profession, including knowledge on the organization, such as geographical, cultural and political information. Procedural knowledge includes skills, practical knowledge and tacit knowledge, and finds its expression in the implementing of different procedures, in knowledge about clients, and in psychomotor knowledge, relating to touch and tone of voice in physiotherapy. The second main category, *personal knowledge,* involves knowledge of oneself as a learner and worker, as well as metacognition, seen to include self-knowledge and self-assessment - it resembles *regulative knowledge* in Bereiter's (2002) classification.

While the studies just mentioned offer some insights into the nature of expert knowledge in physiotherapy, less is known about physiotherapy students' conceptions regarding skills and knowledge. To the best of our knowledge, research on students' conceptions of skills has not been conducted previously. For example, searches of the Cinahl, Eric, Pedro, Philosopher's Index, PsychInfo and PubMed databases covering 2000 to 2010 (October 2–5, 2011) show that there is a lack of literature on physiotherapy students' conceptions of skill. Therefore we tackled this topic in the present study, and especially focused on the first year physiotherapy students' conceptions at the very first weeks of their studies.)

AIM

The aim of this study was to examine first year physiotherapy students' conceptions of skill at the beginning of their studies. The following research question was addressed: What kind of conceptions of skill do beginning physiotherapy students have?

METHODS

This study was conducted using a phenomenographic research approach. A data-driven analytic approach was used, meaning all findings emerged from the data (see, Marton and Pong, 2005; Åkerlind, 2005). Phenomenography can be used as a methodological tool to investigate individuals' conceptions of different things (Bowden, 2005; Green, 2005; Marton, 1981, 1995; Marton and Booth, 2009). Previous phenomenographic studies have focused, for example, on students' and professionals' conceptions of learning (Boll and Rosenqvist, 2011; Lam and Tsui, 2013; Larsson and Gard, 2006; Paakkari, Tynjälä, and Kannas, 2010a, 2010b; Skøien, Vågstøl, and Raaheim, 2009; Åkerlind, 2008). Overall, phenomenographic research has proved to be a systematic and fruitful research approach and can be seen as a suitable methodology for examining physiotherapy students' conceptions of skill.

As a research method, phenomenography differs from phenomenology. According to Marton (1981) and Marton and Pong (2005), the difference between phenomenography and phenomenology is related to the fact that any phenomenon can be interpreted and described from two perspectives. In phenomenology, a *first-order perspective* is taken, describing the essence of the phenomenon itself. In phenomenography, on the other hand, the focus is on individuals' conception of the phenomenon rather than on the phenomenon itself. This is referred to as the *second-order perspective.* In phenomenographic studies, data on individuals' conceptions are usually collected with interviews and questionnaires (e.g., Larsson and Gard, 2006; Paakkari, Tynjälä, and Kannas, 2010a, 2011b; Åkerlind, 2008).

In phenomenographic studies, the participants' conceptions are presented in descriptive categories, often referred to as "categories of description" that illustrate the v*ariation* in how the participants understand the phenomenon in question (Uljens, 1996; Marton and Pong, 2005; Åkerlind, 2005a). The assumption is that the categories are hierarchical in nature. In other words, categories or conceptions lower in the hierarchy can be seen as less complex or less developed than the conceptions higher in the hierarchy (Marton and Pong, 2005; Åkerlind, 2008). Another assumption is that although the categories are derived from individuals' in interviews or questionnaires, they do not directly represent different types of individuals. Rather, the categories describe the participants' conceptions on a collective level, that is, they represent collective human experience (Marton and Booth, 2009, 128; Paakkari 2012, 45). The variation in the participants' conceptions is considered to be so broad that even if an individual's conception were to have changed from one time to another, the categories' general representative proportion would remain nearly unaffected (Uljens 1989, 42; Marton and Booth, 2009, 128).

Participants

The participants in our study were Bachelor's degree physiotherapy students at a Finnish university of applied sciences, who started their studies in 2009 (for more information about the European higher education system and qualification structure, see EQF, 2008). The university granted the permission for the implementation of the study. The first author met all first year students (N=40) at the very beginning of their physiotherapy studies, that is, on their second day, she described the study and invited students to participate in the research. A letter providing details about the study was handed out to students and 35 of them confirmed their willingness to participate in the study by giving their signed consent. Participation was voluntary and participants were free to withdraw from the study at any time. Confidentiality was guaranteed in the informational consent document attached to the *Background Information* questionnaire. Anonymity and strict confidentiality have been maintained throughout the reporting of the findings (see e.g., Patton, 2002; Silverman, 2011).)

Of the 35 participants 9 were men and 26 were women, and they were between 19–35 years old. Everyone had passed the matriculation examination in upper secondary school. None of the participants had undertaken any previous studies in the field of physiotherapy, and having clinical experience before the start of the Bachelor's degree program was not a requirement. Six had already gained a higher education degree or a vocational degree earlier on, and three had dropped out of their earlier higher education studies. The majority of the participants had gained some kind of work experience before starting their university studies, mainly in the form of summer jobs or a profession—but none of the participants had worked in the field of physiotherapy before. Eight of the participants, however, had gained work experience in fields related to physiotherapy, such as having worked as an assistant nurse, massage therapist or rehabilitation assistant.

Data collection

In most phenomenographic studies, the data on students' conceptions are collected in interviews. In our study, we decided to explore the feasibility of essay writing to gather data since writing has been proven to be a functional tool for reflection and learning (e.g., Langer and Applebee, 2007; Tynjälä, Mason, and Lonka, 2001), and because reflective writing is used as a learning method in physiotherapy education. Furthermore, in some previous phenomenographic studies, conceptions have been successfully investigated using both interviews and written essays (see e.g., Paakkari, Tynjälä, and Kannas, 2010a, 2010b; Åkerlind, 2008). Åkerlind (2005a, 2008) emphasizes that essays can be a functional expressive medium through which individuals can report about their conceptions (see also Marton and Booth, 2009, 130).

Additionally, essay writing was the fastest way to collect students' conceptions of skill at the beginning of their studies. The research data were gathered immediately within the two first weeks of the participants' physiotherapy studies because our aim was to examine beginning students' conceptions of skill before they had studied physiotherapy. The students were asked to write an essay, 1-2 pages, on the theme: "My skills." The idea was that students' writings on their skills would reflect their general skill conceptions. The)

students were not required to adopt any specific genre but they were encouraged to write freely and in their own words.

The students wrote their essay in Finnish and the quotations that we have selected were translated into English. The first translation was undertaken by the first author and discussed with all the researchers, and finally proofread by a professional.

Analysis

In our analysis, we followed the principles presented in phenomenographic literature (e.g., Uljens, 1996; Marton, 1994; Marton and Pong, 2005; Åkerlind, 2008).

The analysis was carried out by the three authors in two main phases. The first phase focused on identifying and describing the participants' conceptions of skill in the general terms of their overall meanings. First, the essays were read thoroughly several times by the first author in order to get familiar with the contents of the essays and to distinguish different kinds of conceptions. Next, the conceptions expressed in the essays were grouped into meaningful clusters, tentatively, according to their differences and similarities. After that, the first author formed the first draft of qualitatively different categories. Thereafter, all three authors collaborated with one another to modify the categories several times, based on the selected quotations, until the categories were established and named. In the second phase of the analytic process, the relations and hierarchies between the categories were determined by identifying the *themes of variation,* that is, the themes that differentiate the categories. This was also done in collaboration between the three researchers. In this phase, some last modifications to the categories were made. Finally, the descriptions of the categories were developed and agreed on by the three researchers. To sum up, the categories mainly emerged in the first phase of the analysis, whereas the themes of variation emerged during the second phase of the analytic process. However, to a certain extent these two phases of the analysis overlapped.

In the present study, we aimed to outline the variation among physiotherapy students' conceptions of skill. In line with phenomenographic principles (e.g., Marton and Booth, 2009; Marton and Pong, 2005; Åkerlind, 2008), the descriptive categories do not represent

individual students but relate to the variation in the students' conceptions identified in the research data overall. In other words, the categories describe students' conceptions on the collective level (Marton and Booth, 2009, 124–128). In the present study, this means that the set of categories describes all possible skill conceptions in the overall data and that individuals may have expressed more than one conception. The categories are in a structural and logical relationship with each other and form a hierarchical whole (Marton and Booth, 2009, 124–128; Marton and Pong, 2005; Åkerlind, 2008). This means that the categories are nested and inclusive, so that the categories higher in the hierarchy may include categories that also appear lower in the hierarchy, but not vice versa. Due to the hierarchical nature of the categories, some conceptions of skill can be regarded as more complete or complex than others (see Åkerlind, 2005a).

FINDINGS

In this section, we first present four qualitatively different categories describing beginning physiotherapy students' conceptions of skill. Second, we describe each of the descriptive categories and the themes of variation in detail and excerpts from participants' essays considered to be relevant, citing quotations from both women (F) and men (M).

Physiotherapy students' conceptions of skill at the beginning of their university studies can be described with the following categories: 1) *Talents;* 2) *Skills requiring individual practice*; 3) *Skills requiring social practice*; and 4) *Competence requiring collaboration* (Figure 1). The formed categories can be seen to be hierarchically structured, so that the categories at the top of Figure 1 represent a more complex understanding of skill than the categories at the bottom. In addition, the categories II to IV may include aspects from the categories on their left (Table 1) or below them (Figure 1), but not vice versa. The aspects distinguishing the skill categories, the themes of variation, were named: Acquisition, Emotions, Motivation, Reflection, Evaluation, Agency, and Social Environment (Table 1). Each of the four skill categories is described in more detail below. The themes of variation is marked with italics when mentioned first time in each category.

Insert Figure 1 about here

FIGURE 1 The Four Skill Categories Describing Physiotherapy Students' Conceptions of Skill.

Insert Table 1 about here

TABLE 1 Physiotherapy Students' Conceptions of Skill at the Beginning of Their Studies

Category I: Talents

In the first category, skills were seen as talents. The *acquisition* of talents was seen as genetic. Thus, talents were perceived as inborn attributes inherited from one's parents. Related to talents, physiotherapy students expressed their *emotions* as gratefulness for having a talent or disappointment for lacking it since. As talents were regarded as genetic characteristics, the *motivation* in gaining them was not discussed, nor the aspect of *reflection*. One theme of variation was *evaluation*, that is, how students evaluated their skills. In this category, evaluation manifested itself simply in talent recognition. Students were critical in evaluating their own talents; they valued, underestimated or were proud of them. The theme of variation called *agency* refers to individuals' experienced capacity to act in relation to the development of skills. In this category the agency appeared as passive and individual. Learning skills was seen as inherent, requiring no active personal effort. Talents were regarded as constant. They did not change or disappear even over the course of many years. Talents were seen to be inherently individual, which is why the *social environment* for gaining those skills was not discussed and was regarded to be non-significant. The view of skills as talents often emerged in statements describing skills related to music, sports, technical fields, and social life. These points are illustrated by the following quotes (with sources in parentheses following each excerpt):

Skills are in some way inherent gifts. I consider myself to be a skilled listener. (F15)

You either have or do not have an ear for music. (F10)

I feel that I do not have any great and long-lasting expert skill. (F13)

I quit playing piano a long time ago, but not all skills disappear quickly. It is nice to notice that after a break of many years, I can still catch the notes and rhythm. (F9)

If I try to analyze my skills, what first comes to my mind is a division between sports and music. I have tried both and put a lot of my time into both, but for some reason my interest in music died and to this day I do not feel that I have musical skills. I do have a sense of rhythm but I cannot create music myself, so to speak, at least not by playing or singing. (F8)

Category II: Skills requiring individual practice

In the second category, skills were seen as attributes requiring deliberate practice. For the *acquisition* of these skills, in students' view, practice was essential; unlike in the previous category, where the skills were regarded as inherited. The experiences associated with this view were related to different hobbies, jobs, and duties in all areas of life.

In developing dancing skills […], for example, it is not possible to be able to naturally know all of the small details involved in the different dancing techniques. Rather, you must repeat things many times, so that you learn the dancing techniques. Dancing is a kind of sport, where you learn a skill; you learn to master the meticulous movements only by training hard – there is no fast track. (F10)

As regards *emotions*, the respondents indicated that they are excited about and enjoy learning new skills. Passion, pleasure and pride were the feelings that they expressed when describing their emotions. Sometimes students found it a strain to practice and suffered from stress, but the strains were encouraging, positive stressors, and the emotional charge increased so that they wanted to train more without stopping.

I believe that human beings feel better about themselves and their experiences the more skillful they become at doing things that they enjoy, as pleasure and a feeling of satisfaction often go together with success. When you succeed you know that you can manage the subject or that you are skilled in it. (F27)

As for *motivation*, the responses grouped in category II reflect students who had their own personal goals and were motivated to achieve their targets; unlike in the previous category, where motivation was regarded to be non-significant.

Out of my own interest, I have built my own path toward skillfulness in different things, such as in sports and exercises; I mean, for example, my Karate hobby. (F12)

As regards *reflection*, the participants their own skills, and were able to reflect on their earlier skills and learning experiences in childhood or in primary school, for example. Sometimes students expressed disrespecting their skills, neglecting or abusing their abilities. Unlike in the previous category, where *evaluation* meant talent recognition, in this category, evaluation appeared as a kind of self-evaluation that seemed versatile and even critical.

I am a logical thinker. My spatial ability is good and it is easy for me to assess the whole as a unit […]. Music partly goes hand in hand with mathematics I mean the sense of rhythm. I think that sport also contributes to one's sense of rhythm; that's why rhythm is the easiest of the musical skills. (F27)

While, in the previous category, putting active personal effort into skill learning was seen to be unnecessary, in this category, active *agency* was emphasized. The person's agency remained on the individual level without the element of the *social environment* being accounted for in the skill development, similar to the first category.

I grew to see how other people experience music, and when I was getting the hang of how differently they understand rhythm, my attitude changed completely. (F10)

Category III: Skills requiring social practice

In the third category, the role of *social environment* appeared as a new aspect in students' conceptions of skills. The skills in this category were seen as requiring social practice, in contrast to categories I and II, where skills were regarded as purely individual characteristic. Students described how they practiced skills through social interaction, and they illustrated experiences of developmental feedback having contributed to the *acquisition* and development of some of their skills. They felt that it helped them to recognize their skills when they received relevant feedback from others and benefitted

from it in developing their skills further. As regards *emotions*, the responding students were in a good mood after being successful in a social activity, and even so if their experiences were strainful and strenuous and their feelings were not really positive. Sometimes they expressed feeling emotions of anger or disappointment when having received negative feedback during practice with others.

My different kinds of hobbies have affected my skills a lot. When I was involved in team sports, I learned a lot about group work and being a team member. (F11)

You don't always have to be arrogant and harsh, but you can give feedback in a constructive and friendly way (like feedback to players as a captain of a sports team). At one point I learned this the hard way because I hadn't given others a turn to speak. (M20)

In this category, the *motivation* for practicing skills was the common goal or target that was seen to be important for improving one's skills. Unlike in category I, where the motivation was not discussed, or in category II, where personal targets were meaningful, in this third category the students were more dependent on a group and common goal.

My sports team has a common target: success. The team has to push hard to achieve its goal. (M1)

Regarding *reflection*, in students' view, engaging in critical reflection together with others was seen to be essential; unlike in category II, where reflection was up to the individual. It was seen to be important that other people encourage individual to reflect on him- or herself as well as on the group and the common skills. Thus, co-reflection was seen to be more relevant than self-reflection, in this category. For the *evaluation* of skills, in students' view, social communication was essential; unlike in the previous categories, where only talents or skills were recognized and self-evaluation was used. Peer-evaluation was seen not only as a personal resource, but also as a helping and caring resource for others. Students felt that it can be easier to evaluate others' than one's own skills. Peer-evaluation developed students' self-evaluation skills and grew in social practice.

It is often the case that people learn to appreciate their own skills but believe in them only after someone else shows appreciation for them and their specific skill. I think it is much easier to see things in other people what they are skillful at than to find and identify one's own skills. (F23)

As regards *agency*, in this category, similarly to the previous one, the students emphasized their active input in developing their skills. In this category, however, students' agency did not remain individual. Instead, the students were interested in working together in groups, thus stressing team agency. The students felt that the team or group helps them to gain new meaning and relevance for practicing or acquiring new skills.

[Regarding] us new employees [...], of course, at first you need help and support from others who already master the skill, but by doing and practicing you start to learn. After this experience, it was easier to develop my skills further and to be more efficient at them. (F5)

As the descriptions above show, the *social environment* emerged as a crucial aspect in this category. Interaction with peers and friends were seen as meaningful and as an important mirror for oneself. The social environment was also seen as a source for competition among students. Competition with others, such as in the case of team players in a sport, was a way for students to practice their skills, and in doing so, they were active and fought to get good results and to achieve their common goal. Thus, the social environment appeared either as a mirror for reflection or as a resource in the form of competition.

Our supervisor gave our gymnastics group a common challenge, saying: "You have to train and stretch every evening at home, girls. It would be great if all of you could do a split by Christmas time." After three months, the persistent and hard training finally paid off. After stretching at the end of our last training lesson, I did a perfect split – it came as a surprise to all. (F19)

Category IV: Competence requiring collaboration

The fourth category addresses the conception of skill emphasizing collaboration with others in certain contexts. The *acquisition* of this kind of competence was not seen as a one-off event, but rather as requiring continuous maintaining and monitoring within a community.

The development of competence was seen to occur progressively. As regards *emotions*, students' appreciation and respect emerged from the data. Students appreciated their own success alongside that of others and being respected as a team member. They expressed)

a wish to integrate in a community or respected themselves as part of a community or group. They felt frustrated, shocked or after being unsuccessful with a team, for example, if their team did not win a game.

In this category, the *motivational* basis was having a target orientation with collective goals. The students thought that collective aims can only be achieved through close teamwork, be it in collaboration with family members, fellow workers, colleagues, or sports team members. Building competence through collaboration with others required active effort and responsibility. As regards *reflection*, the co-reflection described in the previous category translated into social reflection here, involving not only individual reflection in pairs but also a larger group of people reflecting together. Social reflection was seen to play a role in taking care of everyday chores, and in acting as well as coping in conflict situations. Students presented social reflection as the ability to find solutions to problems together with other people in various situations or circumstances, similar to the social interaction that took place between siblings and parents or in working communities.

For me, one of the most important social skills is to be able to take account of people and their feelings. You must understand that not everybody experiences all matters the same way as you do, and our different kinds of background shape us to act in very different ways in some certain circumstances. I have two younger sisters and so I am the oldest sibling, which I believe has shaped my social skills to be somewhat different compared to those of my sisters […] Because of being a role model as the oldest child, I consider myself to be a more highly skilled leader than my siblings are; but they have their own social strengths that I envy, such as my middle sisters' ability to be a great mediator. (F27)

The experiences reported by students express their efforts to develop their competences together with others, such as with team members preparing for a sports competition. In addition to category III, where *evaluation* was bilateral and related to one other, in this category, the evaluation of skills was seen to develop together with others, such as when students were participating in different kinds of societies and groups.

In my opinion, team sports develop all skills in an optimal way: an individual has to have good personal skills to be considered 'good news' for his or her team. At the same time, in team sports, social skills also have an important meaning. You don't relate well to other people, if you not get along with them. I have pretty good social skills, I think. I suppose so, because I have gotten into or have found myself in many different and sometimes tricky circumstances. For example, when someone in a sports team fails, someone must tell him or her about it. (M20)

As concerns to *agency*, in this category, it expanded from team agency to communal agency with individually experienced responsibility. The participants reported that they continued to maintain their skills collectively in different contexts and they would practice individually for the sake of their team. In this context, competence required active and responsible collaboration, and students wanted to go by their team. The students were willing to make adjustments to achieve the collective goal; they felt that they were prepared to make changes in their life in order to be a part of and practice with their team in collaboration.

In Italy, I have worked with dogs, and there I've learned different skills. I got to know a different culture and to communicate with people who do not speak the same language as me. (F11)

In this category, the *social environment* gave meaning to and provided a target for the collaboration, and it was the most significant aspect. Further examples of social environments mentioned included operating in international arenas or abroad, and interaction in student fellowships.

Fulfilling my military service was the greatest challenge for my social skills so far. Suddenly, I was in a small room with over ten strange people whom I would have to get along with for the next six months. Also, the complete loss of privacy was quite a shock at first. Despite my initial puzzlement, I have good memories from the army and made some friends there as well. (M1)

Summary of findings

Our study revealed that beginning physiotherapy students have wide-ranging conceptions regarding skill. Four descriptive categories could be defined as distinguishing the skill conceptions among the participating students: I. *Talent*s; II. *Skills requiring individual practice;* III. *Skills requiring social practice; IV. Competence requiring collaboration.* Seven themes of variation were recognized: Acquisition, Emotions, Motivation, Reflection, Evaluation, Agency, and Social Environment. In the hierarchical structure's first category, the identification of skills as talents can be seen as the least complicated conception of skill; whereas the fourth category, the conception regarding skills requiring collaborative activities, is the most complex and extensive way of understanding skill.)

DISCUSSION

Skills, as part of higher education learning outcomes, have been given increasing worldwide attention. For example, the OECD has just completed a feasibility study—AHELO *(Assessment of Higher Education Learning Outcomes, 2013)*—in which both field-specific and generic skills were in focus. Evaluations of skills, knowledge and competences are also being conducted by the European Union within a qualifications framework (e.g., EQF, 2008), and by the European Network of Physiotherapy in Higher Education within the context of quality assurance (e.g., ENPHE, 2012). However, less attention has been paid to how participants in education, namely students, understand the nature of skill. In the present study, we investigated beginning physiotherapy students' conceptions of skill in order to produce knowledge that can be utilized in physiotherapy education.

Our study revealed that beginning physiotherapy students have wide-ranging conceptions regarding skill. In general, the specific value of the findings of the present study lies in the increased understanding of students' skill conceptions yielded and the possible pedagogical implications. From a pedagogical point of view, two critical aspects can be identified (Figure 2). The first one is *the role of training* and the second one is *the role of the social environment*. The first aspect, the role of training, emerges in category II, where the ways of understanding skill transforms from innate talents to skills requiring individual practice. The conceptions grouped in category II represent students who were motivated to achieve targets; active individual practice or training was seen as a prerequisite to developing one's skills.

Another critical aspect, the role of the social environment, is the distinguishing factor between categories II and III, where the emphasis on the ways of acquiring skill shifts from individual practice to practicing in groups. The conceptions in category III represent students who were interested in working actively together or required feedback from others, and who were motivated to have a common goal in order to develop and improve not only their own skills but also to be a helping and caring resource to others. In addition, the significance of the social environment — for instance in the case of sports team

members or among friends—emerged as a crucial factor in this conception of skill, functioning either as a mirror or as a motivator in the form of competition.

Insert Figure 2 about here

FIGURE 2 Physiotherapy Students' Conceptions of Skill and the Critical Aspects Defining the Most Important Lines Between the Categories.

The role of training and the role of the social environment are critical aspects from a pedagogical standpoint. Thus, it is important to keep these aspects in mind when discussing the development of skills with students. For example, the talent component among skill conceptions can be a challenge to students' learning of skills because some students may think that one either possesses or does not possess a skill and that practice does not play a significant role. Teachers' job is to emphasize the significance of practice and encourage students to actively develop their skills. Similarly, teachers' job is to organize learning activities so that the value of the social environment in skill development becomes clear to students.

The main finding of the study was that students' conceptions of skill vary. Therefore, it is important that physiotherapy teachers are aware of this variation in students' conceptions. In guiding students to become qualified physiotherapists, teachers and clinical educators are challenged to recognize the variations in their students' conceptions of skill (see, e.g., Cole and Wessel, 2008; Lindqvist et al., 2006). The process of reflection and re-evaluation among students, teachers and clinical educators must be continual in order to assess which skills and attributes are important for the development of students' competence (Jones, McIntyre, and Naylor, 2010; Viitanen and Piirainen, 2003).
Understanding the ways in which students think and act can positively influence the development of physiotherapy students and the future level of the physiotherapy profession (Wikström-Grotell and Eriksson, 2012). Students have to challenge themselves to reflect on the learning of skills and to achieve collaboration with others in order to form progressive skills (see, e.g., Piirainen and Viitanen, 2010). Students should learn to

evaluate their own learning of skills during their studies. Similarly, the teachers should conduct diagnostic evaluations of their students' skills because this enables individualization in their teaching. At the beginning of a course, teachers and tutors could allocate more resources to those students who think that skill is an unlearnable gift they lack and need more guidance and support. Pedagogical strategies could include small group or team teaching, for example. Students on different levels should work together and learn collaboratively. Peer teaching and peer evaluation could help the students with a low skill level and support students' self-directed learning. Writing skills are also important in physiotherapy. Documentation on patient treatments requires good writing skills; reflective diary writing, for instance, can be a good tool for learning those skills (see, Kurunsaari, Tynjälä, and Piirainen, 2014).

From a scientific point of view, the classification of students' broad and differing conceptions of skill may have potential for transforming the way skills are viewed in the physiotherapy profession (see, e.g., WCPT, 2013). An important challenge is to develop curricula and teaching methods that enable theoretical, practical and regulative knowledge to become truly integrated (see, e.g., Tynjälä and Gijbels, 2012). In this way, it is possible to create learning environments where skill and knowledge are no longer treated as separate entities, but where they will be deeply blended together; thus, theory would not be taught separately from practice but theoretical concepts would be used when exercising practical skills and when reflecting on practical experiences. For example, practical training periods could be organized so that students are assigned learning tasks requiring them to reflect on their practice in a learning journal with the help of some theoretical models or concepts. After the practice periods group discussions could be organized to share experiences, and, again, to examine them with the help of theoretical concepts.

In the present study, phenomenography was chosen as the methodological approach in order to spot the variation in students' understanding of skill. Marton (1990) claims that when asking people about their conception of some phenomenon, one can determine there to be a limited number of qualitatively different ways of conceiving the phenomenon. This is why conceptions of a specific issue, such as conceptions of skill in the present study, can be described in a valid way given that adequate research data are available. Thirty-five of the 40 physiotherapy students approached participated in our research and this considerable number of participants, for such a study, allows us to assume that all of

the main variations of skill conceptions are represented. According to Marton (1994), phenomenographic research can at best question self-evident conceptions and conceptualizations relating to the topic being analyzed. In the present study, the conceptions of skill are described in words similar to those used by the participants themselves. Thus, our study has produced knowledge that relates to and can be used in the development of physiotherapy education—as described earlier in the discussion on the pedagogical implications of the study.

In most phenomenographic studies, the data on students' conceptions are gathered through interviews (e.g., Marton and Booth, 2009, 130; Marton and Pong, 2005; Åkerlind, 2005a, 2005b, 2008). In our study, we decided to explore the feasibility of essay writing for this purpose because writing has been proven to be a useful functional tool for reflection and learning (e.g., Tynjälä, Mason, and Lonka, 2001), being versatile and descriptive. We believe that writing essays encouraged the students participating in our study to reflect on their experiences of different aspects of skill in a similar but more defined way as dialogue in interviews might have done (see Marton and Booth, 2009, 130).

The limitations of our study mainly relate to any potential generalizing of the findings. Our research was carried out in the Finnish context, relating to Finland's specific culture, education system and physiotherapy teachers' training in Finland. For example, reflections on Finland's good success in PISA studies have emphasized that, in many ways, the Finnish education system deviates from practices that are typical in many other Western countries (e.g., Sahlberg, 2010). In Finland, moreover, specialized education for physiotherapy teachers is available at universities, which is uncommon in many other countries (see, Piirainen, 2014; Suhonen, 2008). Therefore, further research is needed to examine and understand the conceptions of skill held by students in different cultures and education systems, as well as by individuals in other fields and professions.)

CONCLUSION

The system of categories used to describe physiotherapy students' conceptions of skill has given new insight into the different conceptions students have of skill. The four categories of skill conception reflect broad and differing views on skill, distinguishable by their focus on: I. *Talents;* II. *Skills requiring individual practice;* III. *Skills requiring social practice;* and IV. *Competence requiring collaboration.* These findings can be used as a basis for planning physiotherapy students' curriculum and supporting students on their educational path. Ultimately, physiotherapy students' awareness of different skill conceptions and developing their skills to best advise and treat their patients, will benefit both themselves and the patients.

Declaration of Interest: The authors confirm that there are no financial, employments or personal conflicts of interest associated with the present study and accept responsibility for the content of this paper.

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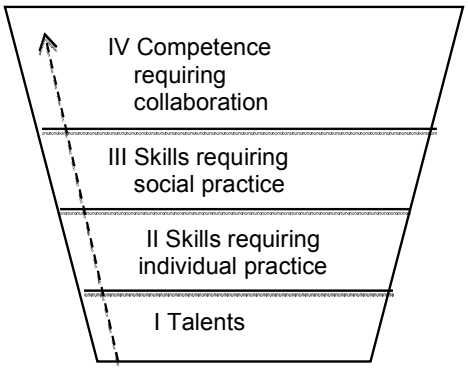

FIGURE 1 The Four Skill Categories Describing Physiotherapy Students' Conceptions of Skill.

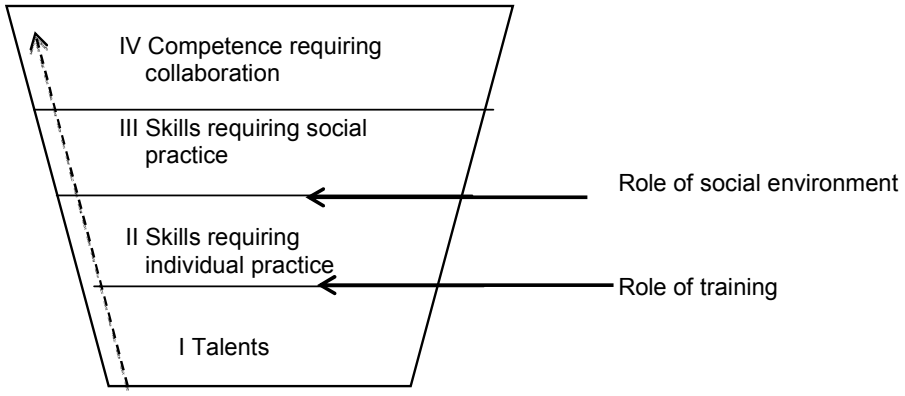

FIGURE 2 Physiotherapy Students' Conceptions of Skill and the Critical Aspects Defining the Most Important Lines Between the Categories.

TABLE 1 Physiotherapy Students' Conceptions of Skill at the Beginning of Their Studies

THEMES OF VARIATION	CATEGORIES			
	I. Talents	**II. Skills requiring individual practice**	**III. Skills requiring social practice**	**IV. Competence requiring collaboration**
Acquisition	Inborn genetic	Gradual individual practice	Practice and developmental feedback	Continuous maintaining and monitoring in collaboration
Emotions	Thankfulness vs. disappointment	Excitement and/or satisfaction vs. disappointment	Good mood vs. disappointment	Appreciation and respect vs. disappointment
Motivation	Non-significant	Personal goal	Common goal	Collective goal
Reflection	Non-significant	Self-reflection	Co-reflection	Social reflection
Evaluation	Talent recognition	Self-evaluation	Peer-evaluation	Collaborative evaluation
Agency	Passive individual agency	Active individual agency	Team agency	Responsibility in communal agency
Social Environment	Non-significant	Non-significant	As mirror, or as competition	Collaboration

II

STUDENTS' EXPERIENCES OF REFLECTIVE WRITING AS A TOOL FOR LEARNING IN PHYSIOTHERAPY EDUCATION

by

Merja Kurunsaari, Päivi Tynjälä, and Arja Piirainen 2016

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FINAL DRAFT

Students' Experiences of Reflective Writing as a Tool for Learning in Physiotherapy Education

Merja Kurunsaari, Päivi Tynjälä, Arja Piirainen

Introduction

The level of autonomy typical in the field of physiotherapy brings with it the need for accountability and responsibility, requiring professional skills in clinical reasoning, independent decision making, and documentation (see Black, Jensen, & Mostrom, 2010; Constantinou & Kuys, 2013; Larin, Wessel, & Al-Shamlan, 2005; Lindquist, Engardt, Garnham, Poland, & Richardson, 2006; Wainwright, Shepard, Harman, & Stephens, 2011). Moreover, in our complicated information-based and technological culture, health professionals need increasingly critical reflection skills. In critical reflection processes, professionals use higher-order thinking to analyse and evaluate their experiences. In such processes, theory is connected to practice, ideally leading to new understandings of dealing with patients. (Delany & Watkin, 2009; Gustafsson & Fagerberg, 2004; Mann, Gordon, & MacLeod, 2009)

In modern health care systems, reflective processes are increasingly related to writing activities. Health and social care legislation, as well as laws on data protection, require that all patient data are based on critical professional reasoning and procedures (e.g., medical treatment plans, rehabilitation, physiotherapy) must be documented and registered (Erickson, McKnight, & Utzman, 2008; Stucki, 2005). Such documentation requires autonomous thought processes, that is, profound consideration and integration of knowledge gained in practice, in order to make appropriate clinical judgements regarding patient treatment. Professionals need the ability to synthesise data and to analytically and reflectively write concise and faithful reports on patient conditions and treatments in a straightforward narrative style (e.g., Jensen, Gwyer, Shepard, & Hack, 2000; Wainwright et al., 2011).

For years, scholars in the field of writing research have regarded writing not only as a means of communication but also as a tool for developing thinking and deepening understanding; in other words, they have seen writing as a tool for learning (e.g., Bereiter & Scardamalia, 1987; Langer & Applebee, 2007; Schön, 1987; Tynjälä, Mason, & Lonka, 2001). It has been suggested that writing can serve as a mediating tool when integrating theory and practice, as a means to explicate and conceptualise professionals' practical knowledge, and as an approach to solve problems and promote the synthesis of different forms of knowledge in clinical settings (see Langer & Applebee, 2007; Tynjälä, 1998, 2001). During the writing process, content knowledge and discourse knowledge interact, which requires and therefore develops higher-order thinking and knowledge transformation through problem solving (Bereiter & Scardamalia, 1987).

Extensive research on writing in clinical settings and its effects on physiotherapy students' learning has indicated that writing facilitates reflection and meta-cognitive processes such as analytic thinking, problem solving, and decision-making (see Donaghy & Morss, 2007; Hayward, Black, Mostrom, Jensen, Ritzline, & Perkins, 2013; Jensen & Paschal, 2000; Kuisma, 2007; Maloney, Hong-Meng Tai, Lo, Molloy, & Ilic, 2013a). Writing skills are thus regarded as an important tool in the expertise development of health professionals and students, and it has been suggested that reflective practice, including complex writing tasks such as journal writing and critical essay writing, should be utilised systematically during studies from the beginning (Constantinou & Kuys, 2013; Donaghy & Morss, 2007; Plack & Greenberg, 2005; Tryssenaar & Perkins, 2001; Williams & Wessel, 2004; Williams, Wessel, Gemus, & Foster-Sargeant, 2002). This is supported by a systematic review of reflective practice in health professionals' education (Mann et al., 2009), which revealed that different forms of writing and writing tasks seemed to be the most useful learning strategy for success.

In this chapter, we describe a study in which reflective writing and video recordings of students' practical experiences were used in physiotherapy education. In previous studies, self-documentary videos have helped to stimulate physiotherapy students' reflections in both oral form (Laitinen-Väänänen, Talvitie, & Luukka, 2007; Lähteenmäki, 2005; Maloney, Storr, Morgan, & Ilic, 2013b) and written form (Maloney et al., 2013a; Maloney, Storr, Paynter, Morgan, & Ilic, 2013c). However, there are no systematic analyses of the different ways in which students may experience reflective writing based on video recordings of their practices. Therefore, the aim of the present study was to describe the variation in students' writing experiences as a tool for learning in physiotherapy education.

Reflective Writing and Professional Development

Definitions of reflection date back to the 1930s. Dewey (1933) characterised reflection as active, perseverant, and accurate deliberation that presupposes knowledge about the issue being clarified and leads to summaries and conclusions. When defined this way, reflection has clear connections to critical thinking (see Langer & Applebee, 2007; Mann et al., 2009; and Tynjälä, 2001). According to Schön (1983, 1987), reflection means understanding and thinking about one's self-awareness, learning from one's experiences, and wanting to improve one's actions and behave in a new and different way. Reflection is a mental process aimed at solving complex and unclear issues, less clear thoughts and ideas for which there are no obvious solutions.

According to Schön (1987), an essential goal of professional competence development is enhancing students' ability to reflect, which occurs best in uncertain and complex situations of clinical practice. Mezirow (1991,1998, 2003) has suggested that critical self-reflection enables transformative learning, that is, learning that leads to changes in learners' beliefs, attitudes, and other "meaning schemes" (see also Bourner, 2003). Similarly, accounts concerning the development of professional expertise have regarded reflection as a means to develop self-regulative knowledge, a main component of expertise (Bereiter, 2002; Heikkinen, Jokinen, & Tynjälä, 2012; Tynjälä, 2008; Tynjälä & Gijbels, 2012). As a result of the widely acknowledged significance of reflection in professional learning several models of reflective practice have been presented. The most cited, to mention a few, include Kolb's (1984) *experiential learning model* and Schön's (1987) concepts of *reflection-in-action* and *reflection-on-action*.

In the field of social and health care, reflection is widely recognised as a prerequisite for lifelong learning and the development of practices. Even during their education, students often encounter unpredictable challenges while working with clients and patients (see Jensen et al., 2000; Lindquist et al., 2006). To manage in those circumstances and to develop as reflective professionals, students need practice in critical reflection. Therefore, critical reflection is included in many health care curricula, such as those in physiotherapy and nursing (see, for example, Delany & Watkin, 2009; Gustafsson & Fagerberg, 2004; Piirainen, 2007; Piirainen, Julin, & Immonen-Orpana, 2007).

The role of writing in reflection is often emphasised. As an activity of "making thinking visible" (Flower, Wallace, Norris, & Burnett, 1994), writing makes it possible to explicate tacit knowledge and conceptualise experiences (Eraut, 2004; Nonaka & Konno, 1998; Tynjälä, 1998, 2001, 2008).

Bereiter and Scardamalia (1993) have recommended that, in order to develop their expertise, professionals should constantly read and write about their domains. In considering writing as a learning process, Bereiter and Scardamalia (1987) have recognised two models of writing: the *knowledge-telling model* and the *knowledge-transforming model*. The latter represents a reflective problem-solving process that enhances both writing ability and content understanding.

Classical studies of writing as a learning tool have shown that any kind of writing combined with reading leads to better outcomes than reading without writing, but that, of different writing activities critical reflection produces the best learning results (Langer & Applebee, 2007). However, certain prerequisites to functional writing assignments in professional domains can be identified. For example, Tynjälä (2001) has summarised the following prerequisites for functioning writing-to-learn assignments: tasks should promote *knowledge-transforming* (rather than *knowledge-telling*) processes; they should encourage students to reflect on and theorise their experiences, conceptions, and new knowledge; and they should enable the connection between theories and practical problems and the conceptualisation of personal experiences in the professional field.

Critical essays and reflective journal writing are examples of writing tasks that make it possible to fulfil these demands. Moreover, effective and explicit guidelines for students are needed. Langer and Applebee (2007) underlined five important components of instructional scaffolding necessary to reflect critically: students should express their own ideas, the context should be familiar, teachers should support students with commentary and plan and initiate learning activities, the relationship between students and teachers should be collaborative, and instruction should take place in a context where both the students and the teacher have an active role. Furthermore, it has been stated that assignments should be complex enough to challenge learning and reflection (Bereiter & Scardamalia, 1987; Schön, 1987, 1991; Tynjälä, 1998, 2001). For instance, complex patient case study examples can provide proper challenges to encourage critical reflection (Donaghy & Morss, 2007). In summary, the integration of reading, writing, and domain-specific practice is important to developing professional and expert knowledge (for example, see Langer & Applebee, 2007; Tynjälä, 2001; Tynjälä & Gijbels, 2012).

In the field of physiotherapy education, reflective writing has been investigated mostly with regard to written assignments during practical training. Previous research has demonstrated the effectiveness of journal writing as a tool for developing physiotherapy students' reflective skills and practice (e.g., Chirema, 2007; Constantinou & Kuys, 2013; Larin et al., 2005; Musolino & Mustrom, 2005; Tryssenaar & Perkins, 2001; Williams et al., 2002; Williams & Wessel, 2004).

There is evidence that reflective journals facilitate physiotherapy students' reflective thinking and help them to analyse their feelings and consider how they will handle different patient situations in the future (Larin et al., 2005; Williams et al., 2002; Williams & Wessel, 2004). Chirema (2007) suggested that writing journals are a valuable tool for stimulating thinking and developing new perspectives. Guided journal writing in particular seems to help students to think critically and avoid uncritical modelling in clinical placements (Constantinou & Kuys, 2013). On the other hand, it has been observed that the subjectivity of reflection and difficulties in improving related skills can confuse both students and tutors in their self-evaluations. This creates a need to focus evaluations on the reflection process itself, rather than on an individual's personal actions or on actions on a general level (Koole et al., 2012).

Methods

The purpose of this study was to examine physiotherapy students' experiences of reflective writing. In more detail, the following research question was addressed: How do physiotherapy students experience reflective writing as a tool for learning in their education?

Data collection

The participants in our study were physiotherapy students (n=32) at the bachelor's degree level who started their studies in 2009 at a Finnish University of Applied Sciences (traditionally referred to as polytechnics). During their studies (which lasted approximately three-and-a-half years), the students were tasked with video recording their own activities at school and, after their first year of university, also at practical training sites. Students chose their video-recorded situations, in which they had active and responsible roles at school and in practical training settings covering hospitals, health care centres, rehabilitation institutions, clinics, and projects. For example, they selected situations in which they practised core skills in evaluating patients, training skills, therapeutic exercise skills and counselling skills. Reflective writing was utilized to enhance students' awareness of different aspects of learning various skills. No specific genre of writing was required; instead, each student's task was to contemplate, reflect and write in his or her own way.

The study data were collected by interviewing the students on their experiences with reflective writing within the last months of their studies. The open interview question was meant for students to talk about their video-based reflective writing that had taken place throughout their university education. The individual interviews were audio-recorded and transcribed verbatim. The data were analysed phenomenographically.

Of the students participating in the study, seven were male and 25 were female. All the students were between 19 and 35 years old and had passed a matriculation examination in upper secondary school. Five had already gained a higher education degree or a vocational degree, and three had dropped out from earlier higher education studies.

Data Analysis

The data were analysed using a phenomenographic approach. Phenomenography is the study of how people experience and understand different phenomena. The outcome of phenomenographic research is a compilation of *categories of description* that illustrates the variation of conceptions and experiences in the population under investigation (Marton, 1981; Marton & Pong, 2005; Uljens, 1996; Åkerlind, 2005a). In the present study, we examined how physiotherapy students experienced reflective writing as a learning tool in their education.

The analysis of the present research was carried out by its three authors in two main phases. The first phase of our analysis focused on identifying and describing the participants' experiences of reflective writing in general terms. First, the interviews were listened to and transcribed text read as a whole several times by the first author to look for similarities and differences in the students' experiences. Next, the conceptions expressed in the interviews were grouped into meaningful clusters, tentatively, according to differences and similarities. After that, the first author formed the first draft of qualitatively different categories. A preliminary category was formed whenever there was enough evidence for an overall expression of meaning to be distinguished (Marton & Pong, 2005). Thereafter, all three authors collaborated to examine and elaborate categories, based on the original quotations, until they agreed on the descriptive categories.

The second phase of the analysis was also done in collaboration between the three researchers. It focused on examining the structural relationships between the descriptive categories. In other words, the purpose of this phase was to identify the aspects that distinguished the various ways of experiencing reflective writing. We refer to these aspects as *themes of variation*. In this phase, some last modifications were made to the categories. Finally, the descriptions of the categories were developed and agreed on by the three researchers. As in phenomenographic literature, the phases of analysis described above were necessary to ensure the trustworthiness of our findings (see Green, 2005).

According to phenomenographic principles, the categories formed must be in a structural and logical relationship with one another and form a hierarchical whole (Marton & Booth, 2009, pp. 124–28; Marton & Pong, 2005; Åkerlind, 2008). Due to the phenomenographically hierarchical nature of the categories, categories higher in the hierarchy may include aspects of categories lower in hierarchy, but not vice versa; furthermore, categories higher in the hierarchy represent more complete or complex understandings or experiences than those lower in hierarchy (see Åkerlind, 2005a).

Recent phenomenographic studies have identified pedagogically critical aspects in students' conceptions and experiences. These aspects are usually some of the themes of variation identified in the study, and they are critical in regard to changing conceptions and moving from a less developed understanding to a more developed understanding. In the present study, the critical aspects refer to things that are important when aiming to help students experience reflective writing in a deeper and complex way (cf., Marton & Booth, 2007, p. 111). Åkerlind (2005b) pointed out that the critical aspects of categories and themes have to occur in all categories and transcribed data to be considered "critical". It should be mentioned that the categories do not directly represent individual students´ conceptions of reflective writing, rather than they represent students' conceptions collectively (see Marton & Booth, 2009, pp. 124–128).

Findings

Physiotherapy students' experiences of reflective writing can be divided into four descriptive categories: 1) *writing as a useless task;* 2) *writing as a tool for deepening understanding;* 3) *writing as a tool for self-reflection;* and 4) *writing as a tool for professional developmen*t. The aspects distinguishing the categories, that is, the *themes of variation,* were named as follows: *function of writing, focus of reflection, contribution to professional learning, emotions, main attribute of writing,* and *importance for learning* (Table 1). Each of the four categories is described in more detail below. The themes of variation are shown in italics. Excerpts from relevant interviews are included to illustrate the key aspects of the four categories, citing expressions from students with fake names.

Category I: Writing as a Useless Task

In the first category, reflective writing was seen as useless in physiotherapy education. The students expressing this view did not see any *function* in writing, but regarded it as an extra task. Since

writing was regarded as unnecessary work, the *focus of reflection* was not discussed, nor was the *contribution to professional learning* recognised.

Emotions expressed in this category were negative because the students felt that they were forced to write. They described reflective writing as irritating, displeasing, unnatural and fake. They also felt that writing caused extra pressure.

One theme of variation in this category was *main attribute of writing,* that is, the overall impression about writing as an everyday activity. In this category, writing was characterised as difficult and obligatory. The students were aware of high expectations regarding their writing relating to their physiotherapy studies, also in terms of legibility, and thus experienced writing as a strain and found it easier to explain thoughts verbally.

The students did not recognise writing to have any *importance for learning*, nor as *contributing to their professional development*. Overall, they regarded writing as useless. Instead of seeing writing as a useful form of reflection, the students in this category stated that they prefer feedback from their physiotherapy instructor. They saw any personal reflection as useless and did not recognise that writing could further their studies.

> Writing is, I mean… some kind of nuisance… At first, it's quite uncomfortable to look at yourself. It's a bit disturbing, this unnatural situation; it's a fake situation…Generally, I find all reports and learning diaries and so on really painstaking… When I have to write it does not flow, my language is really rigid; so, it's uncomfortable when my text should be smart and legible. (Marja)
>
> From my personal experience, I feel that I get the best feedback from the tutor. I think that it`s a more natural way [of learning than watching the videos. (Mikko)
>
> Perhaps I can go deeper when I explain something verbally..., when I have to give someone... an explanation of what I have learned. (Saaga)

As the quotations above show, it was typical of this category that reflective writing was experienced as a useless and unnecessary task in physiotherapy education. Writing was also seen difficult, and these students seemed to feel increased pressure. Instead of self-reflection, students called for feedback from their physiotherapy instructor.

Category II: Writing as a Tool for Deepening Understanding

In line with phenomenographic research, students' understanding and experiences expanded from one category to the next. Accordingly, in the second category, students did not experience reflective writing as a superfluous task, but as a tool for deepening their understanding and developing their thinking. Unlike in the first category, students in this category discussed the *focus*

of reflection, and it concerned their own actions. *Emotionally,* students' experience of writing shifted from negative to positive from the first to the second category, as the students in the latter category came to see writing as pleasant. The perception of the *importance of writing* thus changed from seeing reflective writing as useless to seeing it as useful for learning physiotherapy.

In physiotherapy students' views, in this category, *the function of writing* was clear: the students felt that reflective writing clarified thinking and brought new and widening perspectives. They felt that writing helped connect theory with practice and join different approaches in their thinking.

> This writing in order to strengthen one's theoretical knowledge is quite good…Perhaps it will lead to resolving unclear issues. I mean that in this way, we can really focus on those things. (Seppo)

> Writing always clarifies your thinking …Yes, I do think it helps, because when you read it afterward it clarifies your thoughts. It's not just an excessive flow of information that you quickly put down on paper but something that you have to think about. (Sirpa)

With regards to the *focus of reflection,* the responding students referred to their own actions. The students felt that writing helped them become more aware of their own doings, and as a result, deepened their understanding. Thus, unlike in the previous category in which *contribution of writing to professional learning* was not recognised at all, in this category reflective writing was seen as a way of developing one's thinking.

> Well, you have to think on a much deeper level… about how you act and why you have done something…, and you need to ponder whether you could have done this and that in some other way, or what was good [in your practice] and that sort of things…, and explain why you have done everything the way you did…and consider what was good. (Riitta)

In regard to *emotions,* the respondents indicated that, at the onset, they were not very excited about reflective writing and did not enjoy it. However, the students' understanding of writing as a challenging and distressing experience eventually changed to a positive one, and writing became easier toward the end of their studies. Students still found writing to be a strain, but the strain was experienced as encouraging. Consequently, emotional charges shifted from negative to positive. While the students described reflective writing as oppressive and agonising at the beginning of their physiotherapy studies, by the end of their studies they described it as being a pleasant activity. Thus, the *main attribute* given to writing was "pleasant". Unlike students in the previous category, who saw writing as difficult and obligatory, the students soon had their own personal goals and enjoyed reflecting and writing.

> Well, at least for me, it has been rather easy to write. You just sit down and open your computer and start to write…, and the words flow –just like that. (Susanna)

As for the *importance for learning,* these respondents regarded writing as useful. They felt that it helped them to think about and analyse their own actions and experiences in a more diverse way than they would have done otherwise.

> If you do the written analysis, you have to contemplate the issue more compared to only watching the video… You really have to think about the situation, how you act, and what you could improve and do in some other way and you know – it's very good for your learning. (Minna)

Altogether, the excerpts belonging to the second category show how reflective writing was experienced as a tool for deepening understanding and developing thinking. Students felt that writing helped them analyse their own action and experiences. It was seen as pleasant and helped connect theory with practice.

Category III: Writing as a Tool for Self-Reflection

In the third category, reflective writing has turned into a more profound of self-reflection. The students felt that the writing task required personal insight and caused their focus to expand from their own actions to their interactions with others. In this category, students felt that in addition to developing their thinking, writing contributed to their wider personal growth. Compared to the previous categories, in which negative attitudes toward writing were expressed at least at the onset, the respondents in this category expressed positive feelings with respect to reflective writing from the very beginning. Writing was experienced as an enlightening activity and increasingly useful for learning.

The *function of writing* expanded from the general development of thinking to deepening self-reflection. The experiences reported by students were characterised by ideas of reflective writing as enhancing self-evaluation and self-understanding.

> It [practical training] would be kind of insufficient without the written reflection. In the video, you can actually see what's going on, but your own thoughts are left out of the situation; so, for a proper self-evaluation, I do believe that it's really important to do the written part. (Seppo)

The *focus of reflection* expanded from students' own actions to including interactions with patients and clients. For example, the students felt that writing enabled them to reflect on their communication, guidance behaviours, and other interactions with patients at the hospital.

> Well, you sort of analyse what you have learned more accurately, including how and how clearly you explain things to the clients. Yes, this method has been very good. (Niina)

The *contribution of reflective writing to professional learning* was seen as physiotherapy students personal growth both during their studies and for when they would become practitioners in the future (unlike in Category I, in which the contribution to professional learning was not recognised at

all; or in Category II, in which professional learning was mostly seen as the development of thinking). Here, the students had personal development targets and appreciated the usefulness of self-documentary videos and reflective writing in professional growth.

> I feel more complete through that evaluation. I remember when I wrote the first video analysis of a therapeutic exercise in the course, where I was practising a KELA coordination test. I only evaluated how the test should have done, small faults and deficiencies and so on. But now, I notice that I have started to think when I described the client doing this circuit training gym programme that I planned... So now [in planning], I mainly think about how certain movements would suit a specific client, as well as what alternative movements may be good…I think about this from the patient's point of view…I think about whether we have the right equipment, are using the best movements, and so forth. (Juho)

Regarding *emotions,* positive experiences dominated in this category and students expressed that they were interested in writing. Since the students experienced writing as useful for their learning and professional development, the *main attribute describing writing* was *"*enlightening"; that is, students found writing about their own experiences informative and interesting, and they also expressed their personal readiness and positive attitudes in regard to reflective writing. Students had their own personal targets for self-evaluation and writing. Unlike in Category I, in which writing was seen as obligatory, or in Category II, in which writing was mostly seen as pleasant, students in this third category had better experiences of self-reflection through writing and saw writing as illustrative. The respondents were more aware of their learning processes, and they assessed their own reflective writing critically.

> It really opened my eyes…You can see for yourself whether or not you have done something the way it should be done. (Maija)

> When you write it done thoroughly, you can analyse it thoroughly…Writing focuses your attention on the activity and you remember it clearer and understand what you have to develop. You get a better, more detailed and precise conception of it. (Roosa)

In sum, in this category, the physiotherapy students described that it was useful and interesting to open up and analyse their work with patients and clients. Writing was seen as a tool for self-reflection and the students felt that it deepened their self-understanding. Writing was experienced as pleasant as well useful for learning and the development of critical thinking.

Category IV: Writing as a Tool for Professional Development

In the final category, the role of reflective writing in students' learning widened further from being a tool for self-reflection to one for choosing one's professional direction. The fourth category addresses students' experiences of writing as developing their professional competence, know-how and identity. The focus of reflection expanded from the students' actions and interactions with patients to their interaction with the professional community. The students' understanding of and

collaborations with clients, colleges and multi-professional workplaces widened. The perceived usefulness of writing thus expanded from improving one's personal development to enhancing one' own social growth as a member of a community. The emotions related to reflective writing were positive and broadened even to the point of students feeling inspired and motivated. As a result, the role of writing in physiotherapy studies widened to one of empowering activity. Overall, the meaning and significance of writing developed to such a degree that it was seen as necessary for learning.

The *function of writing* in professional development was seen not only as a tool for self-evaluation, but also as an activity strengthening professional competence and identity in physiotherapy. The students felt that reflective writing tasks enhanced the development of their professional competence.

> It is important that you grow as a professional and also as a human being, and that you can evaluate yourself realistically and see your action from an outside perspective. (Juho)

The *focus of reflection* in reflective writing widened from the students' own actions and interactions to their collaboration with others in the professional community. For example, students imagined themselves as members of professional communities in hospitals and health care centres, as team members in inter-professional groups, and as partners in cooperative project work.

> At the clinic…even the actions of the different physiotherapists diverged a lot. One doctor might find one thing and you another. But anyway, we physiotherapists examine patients' functioning more, whereas doctors conduct other kinds of examinations. (Sanna)

While in the previous category, the *contribution of writing to professional learning* was related to the students' own growth, in this category the experiences reported by the students expressed efforts to contribute not only to their personal but also to their social development, such as their ability to work together with clients and physiotherapists in a professional community.

> One of my physiotherapy tutors has been working in this particular department at the hospital for only a short time. He said that he has solicited the other physiotherapists' assistance quite often, such as when he has noticed… that muscle and therapeutic training does not help a patient and he does not know why. Even he does not have enough knowledge or experience…; so, together, we have both asked for help and recommendations as to what shall we do since some of the other physiotherapists have more experience. (Leena)

> Well, you sort of analyse what you have learned more accurately …, including how and how clearly you explained things to clients, and so on. Yes, this method of reflective writing has been extremely good. (Niina)

Students' *emotions* developed from positive to flowing experiences. Physiotherapy students expressed, for example, excitement and feelings of empowerment due to personal reflective writing.

> They [reflective writing tasks] are incredibly good for your professional growth. (Maija)

Video recordings were considered important as a basis for reflection.

> Well, in the video you can see very well what you are really like in those situations. For example, regarding the latest video that was shot during my advanced practice: somehow, you think of yourself so differently. It's kind of exciting to watch it, even my voice sounds so different; but somehow, I have quite a positive view of it. (Niina)

The *main attribute given to writing* varied throughout the categories. While in Category I writing was seen as difficult, in Category II it became pleasant. Further, in Category III, in which the students began to see writing as useful for their personal development, reflection through writing was seen as an enlightening experience. Finally, in Category IV, writing was experienced even more as an empowering activity. Some students described writing in terms of knowledge transformation (cf., Bereiter & Scardamalia, 1993).

> When you have time to write things down, you get a lot of it… When you first write them down and then read them, you realise that otherwise you wouldn't have thought about these things in the first place, but now you are sort of processing them. I mean, you can take it further when you can go through it again compared to when you first thought about it and put it on paper... Yes, I think it's better to write things down properly. (Juho)

Due to the very positive experiences of reflective writing, the *importance of writing for learning* was clear in this category. Writing was given an extended meaning, and was thus seen as important to students' professional development as physiotherapists and as necessary for *professional learning.*

> It's absolutely necessary if you want to develop and look at yourself. (Eino)

In sum, in the fourth category, the role of reflective writing extended to a tool for social development, professional competence and identity. The focus of reflection was on interaction with the professional community. Writing was experienced as positive and it was regarded necessary for learning.

The structures of the categories

The formed categories and their distinctive features, that is, the *themes of variation*, are summarised in Table 1. As mentioned earlier, the themes of variation were named as follows: *function of writing, focus of reflection, contribution to professional learning, emotions, main attribute of writing,* and *importance for learning*. The categories are hierarchically structured, so that the categories on the right side of Table 1 represent a more diverse experience of reflective writing than the categories on the left side of that table. For this reason, Categories II, III and IV may include some aspects from the categories on their left, but not vice versa. In other words, Category II may include the same experiences and aspects as Category I, Category III may include the same aspects

as Categories I and II, and Category IV experiences from Categories I, II and III. For example, in Category IV, the first-mentioned theme of variation, *function of writing,* is "strengthening professional competence and identity". This identified function includes the function identified in Category III, "deepens self-reflection and self-understanding", as well as the function identified in Category II, "develops thinking". In contrast the function of writing in category II does not include the functions "deepens self-reflection and self-understanding" and "strengthening professional competence and identity".

Table 1 *Physiotherapy Students' Experiences of Reflective Writing*

THEMES OF VARIATION	**CATEGORIES**			
	I. Writing as a useless task	II. Writing as a tool for deepening understanding	III. Writing as a tool for self-reflection	IV. Writing as a tool for professional development
Function of writing	Extra task	Develops thinking	Deepens self-reflection and self-understanding	Strengthens professional competence and identity
Focus of reflection	Not discussed	Own action	Own action and interaction	Professional community
Contribution to professional learning	Not recognised	Development of thinking	Personal growth	Personal and social development
Emotions	Negative	Shift from negative to positive	Positive	Positive, flow
Main attribute of writing	Difficult, obligatory	Pleasant	Enlightening	Empowering
Importance for learning	Useless	Useful	Useful	Necessary

Discussion

Although writing skills have been regarded as an important tool in health professionals' and students' expertise development, little attention has been paid to the variation in students' experiences of writing. This study reveals that students have wide-ranging experiences and conceptions of reflective writing. While a few students do not see any value in writing as part of their education, others see reflective writing as a useful or even necessary tool for professional development. These findings have important implications for educational and pedagogical planning and practices in the field of physiotherapy.

The findings of our study revealed four qualitatively different ways of experiencing reflective writing as a tool for learning in physiotherapy education. The first category, the identification of writing as being a useless task, represents the simplest experience, while the fourth and most advanced category, the recognition of writing as a tool for strengthening professional competence, represents the most complex and developed experience. The categories were delimited from each other and organised hierarchically on the basis of six themes of variation: *function of writing, focus of reflection, contribution to professional learning, emotions, main attribute of writing,* and *importance for learning*. In relation to these themes, three pedagogically critical aspects can be discerned: *function of writing, emotions,* and *focus of reflection.* These aspects are critical from the viewpoint of moving from one way of experiencing reflective writing to another, more complicated way (Figure 1).

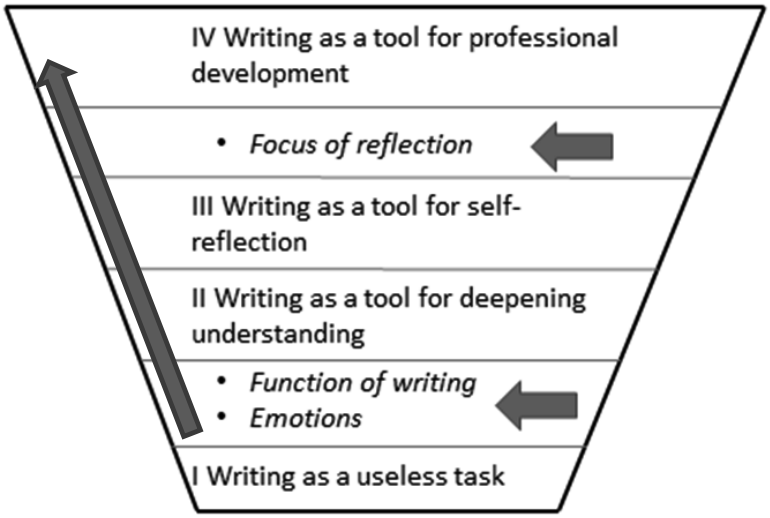

Figure 1. *The descriptive categories of physiotherapy students' experiences of reflective writing and the pedagogically critical aspects from the viewpoint of moving from the lowest to the highest category in the phenomenographic hierarchy.*

The first significant turning point in students' experiences seemed to be between the descriptive Categories I and II, where the students' way of experiencing reflective writing changed from regarding writing as a useless, superfluous, difficult, and obligatory task to experiencing writing as a tool for deepening understanding. Here, the *function of writing* radically changed from something seen to be useless to something that was experienced as being conducive to learning. Therefore, from a pedagogical point of view, it is important to convince students of the value of writing from the very beginning of their studies. This could be done, for example, by presenting them with quotations from more advanced students who had positive experiences, emotions and attitudes, such as those reported here.

Another pedagogically critical aspect was that of *emotions,* and it also appeared strongest between the Categories I and II. This is in line with several recent studies that have stressed the role of emotions in learning (e.g., Arpiainen, Lackéus, Täks, & Tynjälä, 2013; Järvenoja & Järvelä, 2005; Pekrun, Frenzel, Goetz, & Perry, 2007). The findings of our study showed that for many students the feelings related to writing shifted from negative to positive during studies, whereas for others either negative or positive emotions remained as such throughout their education. For effective learning results, it is important to give support in writing-to-learn activities, especially for those students who experience negative feelings. We suggest that in order to decrease anxiety, especially

at the beginning of studies, students should be encouraged to practise free-style writing, that is, writing without regard for grammar, spelling or other formalities, so that they can gain experiences of writing without fear of linguistic mistakes or failure. Some students (e.g., dyslexic students and students with writing problems) need more individual tutoring and guidance, and possibly flexible deadlines to allow them sufficient time to think about tasks and write (see Kerr, 2010). At the same time, there are other students who require more challenging and complex writing assignments. In general, previous studies suggest that all students benefit from the combination of various learning methods, such as reading, writing, group exams, and discussions (e.g., Kuisma, 2007).

Writing not only raises emotions but can also be used to deal with emotions. In some studies, reflective writing has been shown to be an effective channel for a variety of emotional expressions and their handling (Nevalainen, Mäntyranta, & Pitkälä, 2010). This was evident in the present study as well. Given that emotions play an important role in learning processes, it is important that there are tools for expressing and dealing with them. In this respect, reflective writing seems to function well.

The third critical aspect, *focus of reflection*, appeared strongest at the crossover point between Categories III and IV, in which the emphasis of *writing to learn* shifted from self-reflection to a wider perspective of professional competence. In Category III, students found that writing deepened their self-reflection, self-understanding, and personal growth, a finding that confirms previous research studies' results (cf., Donaghy and Morss, 2007; Larin et al., 2005; Maloney et al., 2013a; Williams et al., 2002). In Category IV, the focus of reflection further widened to social development and professional communities in the students' training places. Thus, using reflective writing as a learning tool in physiotherapy education supports the idea that teachers should guide students to reflect more from the point of view of developing their social competence and improving their interaction with the professional community, especially toward the end of the education. Becoming a physiotherapist is a process of cultural learning, with the aim of growing as a member of a community of practice (see Lindquist et al., 2006; Piirainen & Viitanen, 2010; Roessger, 2013; Wenger, 1999).

To summarise, in this study, we examined how physiotherapy students experienced reflective writing based on self-documentary videos of their school lessons and clinical placement practices. The findings revealed a variety of experiences ranging from seeing writing as a useless task to regarding it as necessary for professional development. The various experiences raise pedagogical challenges and suggest the need for support especially those students who do not see the value of

writing in their studies. For most students, however, the combination of video recording and reflective writing proved to be a valuable and effective learning tool (cf., Maloney et al., 2013c). On the basis of our findings, we recommend that reflective writing be used more systematically and frequently in a variety of ways in the field of health education.

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III

GRADUATING PHYSIOTHERAPY STUDENTS' CONCEPTIONS OF THEIR OWN COMPETENCE

by

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ORIGINAL PAPER

Graduating Physiotherapy Students' Conceptions of their own Competence

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Abstract A competence-oriented approach has recently emerged in higher education and thus far, not much attention has been paid to how "competence" itself is understood in education. The purpose of this study was to examine how graduating physiotherapy students perceive their competence at the end of their studies. The data comprised interviews with 33 graduating physiotherapy students. The data were analysed with the phenomenographic approach. The findings indicated that graduating students had different and wide-ranging conceptions of what competence in physiotherapy entails and what their own competence covers. The descriptive categories – *mastering core skills, understanding the theoretical basis of physiotherapy, having a holistic view of physiotherapy*, *engaging in and developing multi-professional collaboration* – varied hierarchically on the basis of seven themes. From a pedagogical point of view, four critical aspects were identified: *focus of reflection, professional agency, cultural awareness and communication.*

Keywords Professional competence · Conceptions of competence · Graduating students · Physiotherapy · Physiotherapy students · Phenomenography

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Introduction

A competence-oriented approach has emerged in higher education discussions and research all over the world in recent decades. For example, to ensure compatible and comparable qualifications among graduates within the European Union, the European Commission has launched the European Qualifications Framework (EQF), specifying skills, knowledge and competences at different educational levels (EQF 2008; European Commission 2014). On a more global level, the OECD recently conducted an international feasibility study on measuring learning outcomes in higher education (AHELO 2013; Organisation for Economic Co-operation and Development 2014; Tremblay et al. 2012).

In higher education the movement from content-centred teaching toward competence-based education has expanded in general (e.g., Bergsmann et al. 2015; Wesselink et al. 2010). At the same time, the roles of students and teachers have changed. Students are expected to be responsible for their own learning, and are encouraged to evaluate and reflect on their personal learning needs and the development of their competences. The teacher's role has transformed from "sage on the stage" to "guide on the side" (King 1993), that is, from just transmitting knowledge to guiding the learning process and encouraging students by mentoring and coaching them to reflect on their own learning processes (e.g., Mulder 2013; Nicoll and Salling Olesen 2013) and develop metacognitive, metastrategic, and epistemological competence (Rapanta et al. 2013). Furthermore, it has been stated that identifying students' competence levels will improve students' learning processes (e.g., Achcaoucaou et al. 2014). The overall aim is to better prepare students for working in different and dynamic professional communities and for facing their professional career with more flexibility and adaptability (Mulder 2013).

In general, competence-based education (CBE)] can be defined as an educational model based on students' academic competence. The starting point of the curriculum design is the description of professional competences to be achieved, rather than disciplinary contents. Thus, learning outcomes are expressed in terms of competence statements that describe performance of professionally related functions or knowledge, skills and attitudes thought to be essential to the performance of those functions (Tuxworth 1989). Other important features of CBE include the use of realistic learning tasks, authentic learning settings and authentic assessments (Bergsmann et al. 2015; Koenen et al. 2015; Mulder et al. 2009; Mulder 2012). Studies on CBE have been carried out in different fields from the perspective of teaching and assessment. For example, some studies have focused on implementing CBE in higher education (Koenen et al. 2015) or on developing and facilitating students' competence development using web technologies and e-learning environments (Schneckenberg et al. 2011). Some other studies have aimed to develop the concept further in order to improve the evaluation of competence-based teaching (Bergsmann et al. 2015), or to evaluate the validity of a self-report instrument for measuring competence (Khaled et al. 2014). Despite a number of studies on the subject, there are still difficulties both to explicitly describe and implement CBE (Struyven and De Meyst 2010; Yanua and Watson 2011).

In fields such as physiotherapy, medicine and nursing, professionals need diverse practical skills and competences when working with patients. Despite the wide interest in the development of professional competences, less attention has been paid to how

"competence" itself is understood in education. Since competence development is the main target of education, it is important for all parties involved to have an explicit understanding of what competence is in the context in question. Therefore, in general, and in the context of physiotherapy in particular, there is a need for conceptual analysis regarding how teachers, students and curriculum developers conceive competences required in their field. In the present study, we begin such an analysis by examining physiotherapy students' conceptions of their own competence, because knowing how physiotherapy students see their competences may suggest critical areas that education should pay attention to in supporting students' learning and professional development. We were particularly interested in students' academic comprehension at the end of their studies, and we belief that research on graduating physiotherapy students' conceptions of their competence may also have relevance for other fields in higher education.

Competence and Competence Development

The concept of 'competence' is widely used in higher education, but a variety of interpretations and even confusion prevails in related literature concerning the term's meaning and conceptualisation (Koenen et al. 2015; Wesselink and Wals 2011. Related concepts include terms such as 'knowledge', 'skills', 'ability', 'capability', and 'expertise'. In recent times, professional 'agency' has also been seen as closely intertwined with those concepts (see Eteläpelto et al. 2013).

Mulder (2011); see also Mulder et al. 2009) has added some structure to the wide and diversified field of competence theory and research. He differentiates between the three approaches to competence. The first one, 'competence as behaviouristic functionalism', refers to 'competencies' as trainable and isolated skills and knowledge not related to occupational epistemologies. The second perspective, 'competence as integrated occupationalism', sees competence as a holistic concept that integrates factors of knowledge, skills and attitudes that are in balance together and transform those elements into an integrated personal capability to achieve results. In the third approach, 'situated professionalism', competence gets its meaning in a specific context and through interaction with other professionals; here, the theories and practices of professional development are closely related.

In recent research literature, it has been typical to see competence as a holistic concept that integrates factors of knowledge, skills and attitudes, and at the same time acknowledges the situated and contextual nature of competence (Mulder et al. 2009). Professional competence refers to a generic, integrated and internalised capability that enables an effective performance in certain task situations, in a real performance context in the professional domain (Mulder 2014). The development of professional competence is a long process that always requires learning as well as what Ericsson et al. (1993) have called *deliberate practice,* that is, the intentional pursuit toward the improvement of performance. This enables an individual to work effectively in different and changing situations, and to learn and develop his or her own competence (e.g., Mulder et al. 2009; Mulder 2011).

The development of competence has often been described as a progression through different stages from beginner to expert level (e.g., in studies on nurses: Benner 2000) or as a series transformational steps such as noted in transformative learning theories (e.g., Mezirow 1990), or as a process of integrating different forms of knowledge as proposed

as part of the integrative pedagogy model (Tynjälä 2008; Tynjälä and Gijbels 2012; Tynjälä et al. 2016). A significant characteristic in competence development is the increase in workers' tacit knowledge, which is deeply related to skills and acquired mainly through practical experience (Eraut 2004).

Competence has particularly been studied in vocational education, where skills, knowledge, attitudes, environments and workplace situations are seen as part of the concept of competence (e.g. Bound and Lin 2013). Various studies have attempted to assess competence in higher education contexts; for example, in regard to newly graduated nurses' competence (Wangensteen et al. 2012), medical students' end-point competence in procedural skills (a systematic review, Morris et al. 2012), and problem-solving competence in case study tasks (Uys et al. 2004).

In the field of physiotherapy, the main focus of the profession is on human movement and function. Thus, professional competence has been related to practitioners' examination and assessment of patients, the provision of advice and guidance, the handling of manual therapies and therapeutic exercise, as well as to supporting clients in achieving optimal freedom of movement and the ability to function, and to promoting health and wellness using evidence-based knowledge. Having good communication skills and cultural competence as well as being able to consult other professionals are also regarded important in physiotherapy (see for example, ENPHE 2012; Larsson and Gard 2006; Lindquist et al. 2010; Thiele and Barraclough 2007; Ven and Vyt 2007; WCPT 2011; Włoszczak-Szubzda and Mirosław 2013). Furthermore, it has been emphasised that physiotherapists need to be versed in various special competencies, such as skills in chronic disease management, monitoring and making early referrals in addition to having disease-specific knowledge (Briggs et al. 2012).

Increasingly, researchers in the field of physiotherapy education and practice have begun to pay attention to the competence perspective; in other words, to how physiotherapy students acquire generic and professional skills and competence for qualification. Their studies have focused on, for example, clinical reasoning skills and manual skills (e.g., Hendrick et al. 2009; Phillips et al. 2009), competence to cure and care for patients (Dahl-Michelsen 2015), argumentation skills (Rapanta et al. 2013), generic professional competence (Shields et al. 2013), cultural competence (Fougner and Horntvedt 2012; Wickford 2014) and interprofessional skills (e.g., Robson and Kitchen 2007).

There are only few studies that have focused on how physiotherapy students themselves view their competence. One of these few is a study by Grace and Trede (2013), who found that students understood professionalism to consist of personal characteristics and behaviours such as punctuality, effectiveness, the ability to handle difficult situations, keeping abreast of the impacts of current research on practices, and trying to advance patient-oriented care.

Research Context and Method

Aim and Research Question

The purpose of the present study is to deepen the understanding of physiotherapy students' perceptions of their profession and, more specifically, to investigate their conceptions of their own professional competence at the end of their studies. The following research question was addressed: *How do graduating physiotherapy students perceive their professional competence?*

Participants

The research participants (n = 33) were final-year physiotherapy students. At the beginning of the first year of their studies, these same students had been asked to participate in a follow-up study spanning from their first year to the end of their studies, and they had confirmed their willingness by giving their signed consent. Participation was voluntary and the participants were free to withdraw from the study at any time. Of the original 35 students, 33 participated in this study to the end. The students were studying at the Bachelor's degree (BA) level at a Finnish university of applied sciences. Of the 33 participants, 7 were men and 26 were women. At the end of their studies, these participants were between 22 and 37 years old (average = 24.7 years) and had studied 2.5–4.5 years. The Bachelor's degree programme (210 credits) consisted of theory studies and practical training (70 credits) at the school and in clinical placements. Eight participants had partly trained or studied abroad, either as international exchange students at a university or in clinical placements.

Data Gathering

The present study was conducted using the phenomenographic method. In phenomenographic research, data on individuals' conceptions and experiences are usually collected through interviews (e.g., Paakkari et al. 2010; Åkerlind 2008). In the present study, the data were gathered by interviewing the students during the last months of their physiotherapy studies. At the beginning of the interview, the students were asked to talk about their life and study process. The open interview approach was adopted to stimulate and encourage students to freely describe their experiences and the development of their skills and competence throughout their university education. The concept of competence was not defined for the students, but they were free to express themselves in their own terms and speak about their personal development and professional competencies on the basis of their own understanding. However, the interviewer directed the interview discussions and encouraged the students to elaborate on their views and experiences in order to ensure that the students would focus sufficiently on their professional development and competencies. Typical clarifying questions were: "Can you give an example of […]?" or, "Could you tell me more about […]?"

The individual interviews, which lasted from 19 to 43 min, were audio recorded and transcribed verbatim. The resulting data consists of 159 A4-pages. For the analysis, the sections of the interviews where students spoke about how they perceive their competence were selected. The students spoke Finnish and the quotations that we have selected were later translated into English. The first translation was undertaken by the first author and discussed with the other researchers, and finally proofread by a professional. The university granted the permission for the implementation of the study. Strict confidentiality and anonymity was ensured throughout the reporting of the results.

Data Analysis

As mentioned above, this study followed the phenomenographic method, which is a data-driven analytic approach focusing on research participants' experiences, understanding or conceptions of a particular phenomenon (e.g. Marton and Booth 2009;

Marton and Pong 2005; Åkerlind 2005, 2012). Previous phenomenographic studies have examined, for example, professionals' and students' conceptions of knowledge and learning (Larsson and Gard 2006; McLean et al. 2015; Paakkari et al. 2010; Skøien et al. 2009; Stenfors-Hayes et al. 2013; Åkerlind 2008). In the present study, the phenomenographic method was used rather than other qualitative methods since it provides a systematic way to explore differences in students' conceptions of the nature of their physiotherapy competence and involves tools that enable elaborating the characteristics of the differences found. The participants' conceptions are illustrated in descriptive categories, which present the *variation* in participants' understanding of the phenomenon in question (Marton and Pong 2005; Åkerlind 2012). The categories are logically related to one another and organised in a hierarchical way: in other words, some conceptions can be seen as more complex and more complete than others (Marton and Pong 2005; Åkerlind 2008). The categories represent the students' understandings on a collective level (Marton and Booth 2009, 128).

The phenomenographic analysis in the present study followed the principles presented in the field's literature (e.g., Bowden 2005; Marton and Pong 2005; Åkerlind 2012), and the analytic process was carried out in two main phases by the three authors. The first phase involved identifying and describing the students' conceptions of their own competence in general terms. First of all, the first author listened to the interviews and thoroughly read the verbatim transcriptions as a whole, several times, to identify differences and similarities between the students' conceptions. Next, the conceptions that were emerged in the interviews were grouped into preliminary clusters. The first draft of qualitative categories was formed by the first author in this way. After that, all three authors together compared the preliminary categories against the data and elaborated the categories when needed. In the second phase of the process, the structural relationships between the descriptive categories were examined. In other words, the *themes of variation* (aspects differentiating the categories) were identified and some last modifications were made. At the end of the analytic process, the descriptions of the qualitative categories of students' conceptions of their own competence were developed and agreed on by the three researchers.

Results

Graduating physiotherapy students' conceptions of their own competence were divided into four descriptive categories: 1) *mastering core skills;* 2) *understanding the theoretical basis of physiotherapy;* 3) *having a holistic view of physiotherapy;* and 4) *engaging in and developing multi-professional collaboration* (Table 1). The formed categories can be seen to be hierarchically structured, so that the categories on the right side of Table 1 represent a more complex conception of competence than the categories on the left side of the table. In addition, categories II to IV may include aspects from the categories on their left, but not vice versa. Regarding the aspects distinguishing between the categories, the themes of variation were named as follows: *nature of competence, communication, knowledge acquisition, focus of reflection, emotions, cultural awareness,* and *professional agency* (Table 1). Each of the four competence categories is described in more detail below. The themes of variation are written in italics where mentioned for the first time in a category. Excerpts from relevant interviews are included to illustrate the key aspects of the four categories, citing responses from both female (F) and male (M) participants.

Table 1 Graduating physiotherapy students' conceptions of their own competence

Themes of variation	Categories I. Mastering core skills	Physiotherapy competence as:		
		II. Understanding the theoretical basis of physiotherapy	III. Having a holistic view of physiotherapy	IV. Engaging in and developing multi-professional collaboration
Nature of competence	Individual skills	Theoretical bases for different skills	Integrated competence	Boundary-crossing competence
Communication	My way to communicate	Understanding patients' communication	Co-operation	Multi-professional collaboration
Knowledge acquisition	Patient data	Evidence-based data (for patients' physiotherapy)	Evidence-based data for developing professional PT	Evidence-based data for multi-professional collaboration
Focus of reflection	Own skills and actions	Interaction with patients	Whole physiotherapy process	Organisations, multi-professional rehabilitation
Emotions	Negative emotions dominate	Coping with emotions	Dealing with emotions with a professional attitude	Dealing with emotions professionally and collaboratively
Cultural awareness	Knowing other cultures	Comparing cultural differences	Widening one's own cultural concept of PT	Ruminating over different social and health care approaches
Professional agency	Focusing on ones' own skill development and growing as a person	Application of theoretical knowledge in practice	Evaluating and developing PT practices	Evaluating different social and health care systems

Category I: Mastering Core Skills

In the first category, competence was seen as the mastering of core skills in the field of physiotherapy. The first identified theme of variation was the *nature of competence,* which in this category consists of individual skills related to the assessment of patients, manual therapy, therapeutic exercise and instruction skills. The students described, for example, skills for planning and organising patients' physiotherapy. The second theme of variation, *communication*, focused on students' own way of interviewing patients; in other words, the students were not completely aware of the different kinds of mechanisms involved in interacting with patients but were more focused on their own speaking. In this category, the third theme, *knowledge acquisition,* was related to the physiotherapist familiarising him- or herself with the patient data by putting active personal effort into data searching; accordingly, skills in reading, writing and understanding patient documentation were seen to be important. Regarding *focus of reflection,* the students paid attention to their own actions and skills, evaluating their own activities in order to recognise their faults. As for the next theme, *emotions,* the physiotherapy students in this category expressed mainly negative feelings such as the fear of themselves or their family members losing the ability to walk or the fear of meeting sick patients or experiencing disappointment or frustration because of patients' difficulties with training activities.

The theme of variation identified as *cultural awareness* was related to knowing other cultures and learning new languages. In this category, cultural awareness was expressed as being able to communicate with foreigners using at least some basic words with patients and their relatives and being able to instruct foreign patients in physiotherapeutic self-treatments and therapeutic exercises. The theme of variation called *professional agency* refers to individuals' way of making choices, taking stances regarding their work and having influence over their work. In this category, professional agency appeared to be focused on the development of students' own skills and on growing as a person. For example, students described that as a result of their studies they had started to increasingly value their own life and began to change their lifestyle to include more exercise and healthy habits. These students also realised that their manual skills were poor and that they needed more practice to develop them.

The view of competence as mastering core skills often emerged in students' statements describing their own individual skills, actions and development, as well as regard to their negative emotions, their own way of communicating, the importance of understanding patient data and knowing other cultures, and focusing on their skill development and growing as a person. These points are illustrated in the following quotes (with the source code shown in parentheses following each excerpt):

> My interview skills are well developed and I can learn step by step what I have to take into account when planning physiotherapy with patients. (M1)

> The most serious thing that could happen would be that I or a family member loses the ability to walk, or contracts a serious illness. (F4)

> I learned a lot about new cultures and I learned a new language, Swahili – at least some basic words to communicate with and instruct patients. (F5)

> My own life has changed; I exercise and consider my health more; I have more awareness of my body and feelings. (F28)

Category II: Understanding the Theoretical Basis of Physiotherapy

In line with the phenomenographic research principles, students' understanding and experiences of competence expanded from one category to the next. Accordingly, **in the second category**, students did not experience the *nature of competence* merely as separate skills and were also considering the theoretical basis of different skills. Thus, physiotherapy competence was seen as understanding the theoretical basis of physiotherapy. In these students' view, theoretical fundamentals such as anatomy, biomechanics, physiology, physiological exercise, motor skills and knowledge of exercise were seen to be particularly relevant for physiotherapy. Understanding patients' *communication* was seen to be important in this category. Communication was also seen as a means to justify treatments, correct patients' knowledge and motivate them by using theoretical arguments. As for the next theme, *knowledge acquisition*, in this category students were searching for evidence-based data to support physiotherapy planning.

In this second category, the *focus of reflection* expanded from the students' own skills and actions, now also including considerations regarding their interaction with patients. The students felt that self-reflection helped them to deduct, solve problems and make decisions in patient situations. Regarding *emotions,* positive experiences dominated and students expressed that they are able to cope with their emotions, control their own feelings and fears, and that they have developed a lot of awareness of their own body and feelings. The students still found new situations and challenges emotionally heavy or worrying but also rewarding. As for the next theme, *cultural awareness,* in this category the students compared other cultures' physiotherapy treatments to Finnish ones. In these students' view, different cultures use different approaches to treating patients and the theoretical bases of some treatments differed; for example, treatments to reduce swelling caused by an operation. Students' *professional agency* covered patients' therapy; the students felt that they have strong and wide-ranging theoretical knowledge and the ability to apply it in physiotherapy practice, although they seemed to need more practical training in applying theory to practice. The following quotations illustrate the views belonging to the second category:

> In order to ensure that my tests and assessments will be reliable and objective enough I practice patient examination and use specific assessment tests. (F9)

> I am client-centred, and I feel that communication and creating a trusting relationship is easy for me. I also feel that I am quite skillful in sort of 'selling' something. For example, I had a patient who used to be a doctor, and this old doctor said that when he swallows, food lodges itself in his 'musculus piriformis'. But this is a muscle of the buttock!

So, I just ignored that and we started with another topic." (F9)

[Physiotherapy involves] critical reflection on risk factors characteristic of patients; for example, an overload in the articulation of the muscles and also malpositioning. (M26)
A feeling of inadequacy took over when treating mentally disabled patients, but it was very rewarding [as a learning experience]. (F29)

A client asked why she can't lift up her arm even though she doesn't feel pain. I had to begin with the basics, from the cell level, and explain that the fracture can't bear any weight; I had to explain the reasons. (F23)

Category III: Having a Holistic View of Physiotherapy

In the third category, competence was seen as taking a holistic approach to physiotherapy. The students expressing this view experienced the *nature of competence* as an integrated entity. In other words, they felt that the human body is a complicated whole where everything interacts and affects everything else, such as the physical, social and psychological aspects of functioning as well as psychic and mental elements. Holistic approach was seen to be important and the key point in physiotherapy. The students described, for example, skills to observe, plan and treat patients using complicated processes, the competence to assess patients' development and progress, and the effectiveness of treatments. The second theme, c*ommunication,* expanded from understanding patients' communication to co-operation with patients and their relatives. Establishing a proper emotional atmosphere and gaining the confidence of the patient were experienced to be relevant when aiming at patients' successful commitment to physiotherapy. Noticing a patient's life crisis, or calming a broken-hearted patient, or communicating nonverbally and verbally in order to gain an understanding of an ALS (amyotrophic lateral sclerosis) patient's neurological state were examples of this kind of communication.

Regarding *knowledge acquisition* students emphasised evidence-based research, theory and current care guidelines (evidence-based clinical practice guidelines), which they were acquiring in an active and critical way. This active, systematic and broadened search for theoretical knowledge based on evidence was seen to enhance students' holistic view of physiotherapy and their holistic professional competence.

As for the next theme, *focus of reflection,* the students paid attention to the whole physiotherapy process. In other words, students' reflection was critical and helped them to plan a more effective therapy process in co-operation with their patients, to change goals when patients' physical or psychic function changed, and to choose relevant and innovative combinations among the physiotherapy treatment options. In this category, *emotions* were not only coped with but approached with a professional attitude so that these students were able to bracket their negative feelings while handling their patients and deal with their own emotions afterward. Students expressed that they are able to cope and work with different kinds of very ill or demanding patients and that they appreciate even small achievements. Regarding *cultural awareness*, students' conceptions of how the cultural dimension is relevant to physiotherapy further broadened. The students compared Finnish physiotherapy and the Finnish way of communicating with patients to the approaches taken in other

cultures. Students described, for example, that in Kenya the whole family gets involved in physiotherapy treatment sessions, helping the patient with the therapeutic exercises according to the physiotherapy student's instruction, or that in some countries small villages are so poor that they do not even have walking aids available and that the student actually built the physiotherapy device with the physiotherapist.

The theme of variation labelled *professional agency* reflected active agency more so than in the previous categories that focused on evaluating and developing physiotherapy practices. Here, the students were also more concerned with ethical principles, and they were interested in evaluating and developing such principles. They felt more competent and motivated, and their development was more intentional.

The view of competence entailing the development of a holistic view of physiotherapy often appeared in expressions describing competence in association with integrated competence, co-operation, evidence-based data, professional attitude, the physiotherapy process as a whole, the widening of one's own cultural conceptions relating to physiotherapy, and the evaluating and developing of physiotherapy practices incorporating ethical considerations. These points are illustrated in the following quotes:

> I consider patients' life situations and motivation, and their social, psychological, psychic and mental resources. (M1)

> I actively and critically search for evidence-based data and conduct research on what kinds of treatments are most likely to be effective; I feel that I can help to heal patients' suffering. (F10)

> I noticed and could follow patients' progress throughout the training period, particularly when comparing the assessment of the treated function at the end of the treatment with that at the beginning. (F27)

> I compare physiotherapy communication and treatment sessions in Finland to those in Taipei. (M21)

> To modernise the old traditions of patient treatment, more effective methods need to be developed. (F24)

Category IV: Engaging in and Developing Multi-Professional Collaboration

In the **fourth category,** which is the final and most advanced as well as complex of the four categories, students understood and experienced competence as developing multi-professional, collaborative work skills. The first theme of variation, the *nature of competence,* expanded here to a kind of boundary-crossing competence. Students expressed that they possess the competence to plan and instruct patients and athletes in collaboration with other professionals from different organisations and societies.

As for next theme, *communication*, the students' co-operation broadened to involve multi-professional collaboration. Students described multi-professional teamwork with nurses, doctors, insurance companies and coaches. In this fourth category, *knowledge*

acquisition was seen to enhance multi-professional collaboration skills through participation in multi-professional documentation and conducting different kinds of evidence-based, research, for example.

The *focus of reflection* expanded to involve reflecting on multi-professional rehabilitation programmes and organisations. Students reflected critically and attention was paid to the whole physiotherapy process. The students still found reflection challenging because every organisation has its own treatment tradition. As for the next theme, dealing with *emotions,* students described a similar professional way of dealing with emotionally challenging situations as the students in the previous category, but now adding an aspect of collaboration. Thus, their individual emotional work expanded to collaborative activity where they discussed their feelings and emotions with their peer students, colleagues and other professionals, from whom students also gained a lot of positive feedback. These students seemed to be particularly concerned with their patients' well-being and the patients' ability to cope in difficult situations.

Regarding *cultural awareness,* the students ruminated over different social and health care approaches. These students were comparing, for example, the roles of patients in Finnish and other cultures regarding care, treatments, hospitals and societies, and they noticed that they differ from each other. The theme of *professional agency* expanded and diversified to include evaluating different social and health care systems as well as guidelines for treating different diseases. The examples below illustrate the views of students in the fourth category:

> Getting in touch with KELA (Kansaneläkelaitos; independent social insurance institution supervised by Finnish parliament) and other insurance companies, for example, and writing expert reports for them, reading up on doctors' medical referrals for physiotherapy, rehabilitation [and so on]; these represent different kinds of multi-professional work and collaboration with other professionals. (F9)

> I wanted to learn more from and be challenged by other colleagues, it was not easy to actively practice critical reflection on other physiotherapists' work or training, for example, in regard to evaluating patients' spasticity […] all organisations have their own customs or traditional treatment methods. (F29)

> In large social and health care service organisations, such as central hospitals, they have their own social and health care service systems and they plan and update their own guidance paths and current care guidelines, including rehabilitation guidelines for different diseases. (M1)

Discussion

While previous literature on professional competence has focused on clarifying the concept of competence in general (e.g., Mulder 2011), or on describing physiotherapy lecturers' and students' understandings of professionalism in their field in particular (Grace and Trede 2013), our study directly examined how graduating physiotherapy students described their own professional competence. It is important to investigate

students' conceptions of competence to see whether there are gaps between graduates' views and the goals of education. The added value of our phenomenographic approach is that the findings concretely show that there is large variation in graduating physiotherapy students' understanding of their competences, and they reveal the critical aspects that need to be considered in order to support students in developing their understanding from less advanced toward more advanced conceptions. In our study, physiotherapy students' conceptions of their physiotherapy competence at the end of their studies could be divided into four descriptive categories: 1) *mastering core skills;* 2) *understanding the theoretical basis of physiotherapy;* 3) *having a holistic view of physiotherapy;* and 4) *engaging in and developing multi-professional collaboration*. The first category represents the simplest conception, while the fourth represents the most complex and developed one. The categories varied hierarchically on the basis of seven themes: *skills, communication, knowledge acquisition, focus of reflection, emotions, cultural awareness* and *professional agency* (Table 1).

In combination with previous knowledge on physiotherapy education, the findings of the present study can be used as a tool for developing pedagogical practices in physiotherapy education to transform students' competences and professionalism. Below, we discuss the implications of the study for educational and pedagogical planning as well as for practices in the field of physiotherapy and possibly other fields. From a pedagogical point of view, four critical aspects can be identified as categories: *Focus of reflection, Professional agency, Cultural awareness,* and *Communication*. These aspects are critical from the perspective of supporting students to understand professional competence in a broader sense.

The *focus of reflection* expanded from physiotherapy students' own skills and actions in category I to the interaction with patients in category II, and developed further to include the whole physiotherapy process as well as multi-professional collaboration with various organisations and rehabilitation professionals in categories III and IV. From a pedagogical point of view, the interesting question is what kind pedagogical practices can promote this kind of expansion in the focus of reflection. Some studies suggest that conversations with different professionals and reflective writing tasks develop physiotherapy students' reflection skills (e.g. Hendrick et al. 2009; Kurunsaari et al. 2015; Lindquist et al. 2006). Thus, in order to bring about development in the focus of reflection, it is important to guide students' reflection with learning tasks that support reflection on different foci. Timely feedback from a tutor to facilitate physiotherapy students' learning (Francis-Coad and Hill 2014) is also valuable. All in all, our findings suggest that reflecting both at the individual and collective level can transform a student's professional competence. Similarly, Grace and Trede (2013) found that students' self-awareness and articulation regarding their own values may develop their professionalism through learning by doing.

The second pedagogically critical aspect, *professional agency*, expanded in a similar way as the focus of reflection, that is, from individual aspects of professional competence toward reflection on and participation in social and system-wide practices. This kind of transformation can be induced by providing students with opportunities for collaboration and multi-professional work, such as with doctors and nurses. It is interesting that in a previous study by Grace and Trede (2013), physiotherapy students' understandings of professionalism did not include multidisciplinary teamwork or preventive health care, whereas, in our study, these came up as important elements in Finnish students' conceptions of professional competence. This probably reflects the

Finnish health care system, which emphasises multiprofessional preventive work and counselling in health care and in physiotherapy in a way that is quite unique in the world. Previous studies have also suggested that interprofessional learning is effective in improving student physiotherapists' awareness of role issues and the ability to develop collaborative work relationships (see Davies et al. 2011). In supporting a multiprofessional approach to working among students, clinical placements play a crucial role. These types of placements have also been found to be central to providing quality in learning achievement, such as in developing a sense of trust and a balance between being supported and challenged (Vågstol and Skoien 2011), and has also been emphasised in Mulder's (2011) *situated professionalism* perspective. Furthermore, work relationships, as well as the quality of guidance given by clinical educators, can contribute to a positive learning environment for physiotherapy students to develop their own learning in workplaces (Patton et al. 2013), and also for clinical instructors and role models to influence students in evidence-based practice (Olsen et al. 2013), as seen in our study. All of this supports Mulder's situated professionalism perspective. Thus, clinical educators should be encouraged to facilitate students' active participation in a workplace, due to its critical contribution to student learning (Virtanen et al. 2014).

The third critical pedagogical aspect in our findings is the role of *communication*. Earlier studies have shown that versatile communication skills are important in physiotherapy (for example, see Hiller et al. 2015). In our study, experiences of understanding patient *communicatio*n clearly emerged within category II, where the students expressed experiences of having the ability to respect all patients and the 'know-how' to co-operate and communicate effectively, and feeling able to cope with challenging situations and to win patients' confidence. These students used theoretical arguments to justify treatments, to motivate patients and to correct patients' knowledge (cf. Rapanta et al. 2013). Skills like having an empathic understanding of patients and respecting patients' feelings, sensations and individual life situations, as well as having an informed understanding of disabilities has seen as essential for physiotherapy students to develop. Similar findings have appeared in numerous other studies as well (cf. Shields et al. 2013; Włoszczak-Szubzda and Mirosław 2013). In this regard, for example, training with simulated patient interaction may reduce students' anxiety and increase confidence in communicating with different kinds of patients (Lewis et al. 2013; Dandridge et al. 2014). Further, communication skill development requires adequate learning time (Parry and Brown 2009) and timely feedback from a tutor in practical training (Francis-Coad and Hill 2014). The learning context and with whom students are learning is generally important (Lindquist et al. 2010).

In times of globalisation, internalisation and increasing immigration, we can regard *cultural awareness* as the fourth critical pedagogical aspect in our findings. In the earlier mentioned Australian study (Grace and Trede 2013), cultural competence was not part of physiotherapy students' understanding of professionalism, whereas in our research for the present study this aspect clearly came up in students' experiences. Developing awareness of other cultures by training in a multicultural environment or by studying abroad through international exchange programmes at foreign universities or in clinical placements is recommended is recommended in the guidelines for students in Finnish physiotherapy education (Finnish Finnish law of University of Applied Sciences 14.11.2014/932).

Pedagogically, it is important that students gain a broad understanding of cultural differences and are able to compare their own circumstances with those of clients from other

cultures. Our findings suggest that studying other cultures in one way or in another broadens one's conception of physiotherapy, and learning in diverse contexts prevents confrontations and misunderstandings based on myths and stereotypes (also found in other studies e.g., Fougner and Horntvedt 2012; Mostert-Wentzel et al. 2013; Wickford 2014). Cultural awareness can be supported during professional studies by including teachings about other cultures in the curriculum, by participating in practical training in different countries, by studying in multinational groups, by participating in intensive multicultural courses such as in summer school, and by systematically reflecting on one's own experiences.

Altogether, the four pedagogically critical aspects described above show the focal points in students' progression from one category to the next regarding their conception of competence. First, we recommend supporting students' *reflection* during physiotherapy studies, or in any higher education studies, so that the focus of reflection gradually moves from personal and individual issues toward social and societal spheres, as this is a key to the development toward a socially responsible professional. Second, paying attention to the ways of *communication* and the development of communication skills seems to support the move from individualistic reflection toward social responsibility. Third, our findings imply that supporting the development of students' *professional agency,* especially in workplaces that provide multiprofessional opportunities, is of crucial importance. Finally, the findings highlight the importance of developing *cultural awareness* in our multicultural world.

The main limitation of this study is typical for qualitative research, that is, the small sample; although, a whole group of physiotherapy students was examined. At the same time, the advantage of this is that a small data set makes it possible to go deeper in order to understand a phenomenon better. In fact, some phenomenographic studies have found that the saturation point can be as small as 11 participants (Mason 2010; Täks 2015, 48–49). Another limitation, related to the previous one, is the fact that the research was conducted in only one discipline. However, we believe that the findings about physiotherapy students'conceptions of their own competence can also be of relevance to other fields of higher education.

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IV

STORIES OF PROFESSIONAL DEVELOPMENT IN PHYSIOTHERAPY EDUCATION

by

Merja Kurunsaari, Päivi Tynjälä, and Arja Piirainen

(submitted)

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