

# Reflective Practice

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# Practical work in physiotherapy students' professional development

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## ABSTRACT

Learning practical work through cooperation between school and working life is part of physiotherapy higher education. Students learn practical work through the integration of theoretical, practical, tacit and situational knowledge in a socialization process. Workplace practices and habits direct students' learning. This study answers the question: What kind of conceptions of learning practical work do physiotherapy students have? Longitudinal data written by 21 volunteer students (mean age 25 years) was collected over three and a half years. Thematic analysis was used to analyse the data. Learning practical work proceeds in five phases: (1) the basis of practical work, human movement and action and therapeutic tools is learned at school; (2) the meaning of the profession and practical work takes shape in an interaction with clients and observing how professionals work in real workplaces; (3) the wholeness of the practical work takes shape by gradually participating in the work processes; (4) critical reflection of the work processes – thinking, construction, evaluation and reasoning – develops; and (5) the conception of practical work widens. This study brings new information about learning practical work for developing healthcare education and its curricula. The role of workplaces is huge in learning tacit knowledge of the profession.

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## KEYWORDS

Practical work; physiotherapy student; professional development; thematic analysis

## Introduction

Immersing themselves deeper into the world of work, the writers paid attention to various concepts used in this area, including practice, practical skills, practical training, practical judgement, instructed practical training, work-based learning, practice-based learning, agency and work agency. The multiplicity of terms used around work demonstrate how complex and difficult a phenomenon it can be to define. Every term has a subtle difference in meaning. The focus of this study is to understand the students' view in learning physiotherapy practical work. For ease of articulation and understanding, the writers use the term 'practical work' to describe all the dimensions and skills learned and needed in work practices.

Aristotle wrote about practical wisdom, an early version of the so-called knowledge and knowing what to do in practice. Dewey (1938, pp. 19–20) highlighted a necessary relationship

between the processes of actual experience and education. The process of experiential learning starts from concrete experience and it includes critical reflection. Learning occurs by reflecting critically upon earlier habitual expectations, revising them and acting according to the revised point of view (Malinen, 2000, pp. 134–140; Mezirow, 1990, pp. 4–5). In every profession, there are the ‘need to know’ issues. In addition to that, previous life experience, internal motivation, problem or life centred orientation and capacity to learn in real-life situations play an important role in adults’ learning (Knowles, 1980, p. 43). Transformative learning from the learner’s point of view includes as many different transformative learning stories as there are people who experience transformation (Cranton, 2006, pp. 19–20).

Students’ professional identity and expertise are built in real work situations and through cooperation between school and working life in the healthcare education sector (Lähteenmäki, 2006; Laitinen-Väänänen, 2008; Piirainen & Viitanen, 2010). Practical training is required in physiotherapy education programs. The Finnish Ministry of Education requires 75 European Credit Transfer and Accumulation System (ECTS) in practical training out of 210 ECTS in physiotherapy education. Practical training consists of workshops at school, working life orientated projects and clinical internships (Mämmelä, 2015; Ministry of Culture & Education, Finland, 2006).

Learning practical work prepares students for their occupations, work roles and identities. Workplace practices and habits direct students’ activities and learning (Higgs, 2013; Evans, Hodkinson, Rainbird, & Unwin, 2006, pp. 3–8). Interactions in the work environment and the employee’s preoccupation affect agency at work (Eteläpelto, Vähäsantanen, Hökkä, & Paloniemi, 2013). Agency at work may be individual oriented or externally oriented. Individual activity focuses on making a difference in or for oneself and one’s own learning and career shaping. The external focus is to make a difference in the current work practice, developing and creating new work practices (Harteis & Goller, 2014).

Students learn formally and informally, experientially, within the bounds of context, within specific fields and by working alone and collaboratively (Billett, Barker, & Smith, 2006; Virtanen, Tynjälä, & Collin, 2009). Learning at work is often informal and incidental, and reflection is needed to make learning more effective and also to unearth erroneous assumptions and mistakes (Watkins, Marsick, & de Álava, 2014). When learning at work for education, pedagogical practices also matter and the integration of conceptual/theoretical, practical/experiential, self-regulative and socio-cultural knowledge is beneficial in the learning perspective (Tynjälä & Gijbels, 2012; Tynjälä, Häkkinen, & Hämäläinen, 2014; Tynjälä, Virtanen, Klemola, Kostiainen, & Rasku-Puttonen, 2016).

Students gather valuable experience and learn a variety of skills by gradually participating in work practices. Students’ development into experts grows with interaction with the workplace’s material, cultural and social environment. Learners become familiar with the tacit knowledge of experts and the working culture (Wenger, 1999, pp. 214–215). Students’ professional identity and expertise are built in real work situations. They get to combine theoretical and practical knowledge, deepen theoretical thinking and practice clinical reasoning and practical skills. In real work, students can also find meanings for what they have learnt at school (Laitinen-Väänänen, 2008). Work increases all the various general and vocational skills and knowledge of students, thinking skills, self-regulative skills, workplace practices, everyday routines, self-confidence and chances of finding employment opportunities (Virtanen et al., 2009).

When starting their own branch studies, physiotherapy students utilize practical ways of learning and are instructed in practical training periods in different physiotherapy areas (e.g.

Laitinen-Väänänen, 2008; Lindquist, 2006), which have been found to be important for their professional development. Nevertheless, physiotherapy students' agency at work and work practices have been the subject of only limited research. A systematic literature review using keywords 'work practices' AND 'physiotherapy students' AND 'professional development' generated one appropriate finding on 5 January 2017 (CINAHL, Medline, Academic search Elite and Eric). Öhman, Salomon, and Finch (2002) see that adapting professional identity is closely connected to the process of socialization. Professional socialization starts at the beginning of the educational program and continues by learning formal knowledge, skills and rules, as well as informal and tacit knowledge, norms, values and loyalties within the profession. Clinical placements have a major role in the socialization process and instructors act as the most frequently chosen role models for the students (Öhman et al., 2002).

The aim of this study was to examine physiotherapy students' conceptions of learning practical work. The following research question was addressed: What kind of conceptions of learning practical work do physiotherapy students have?

## Methods

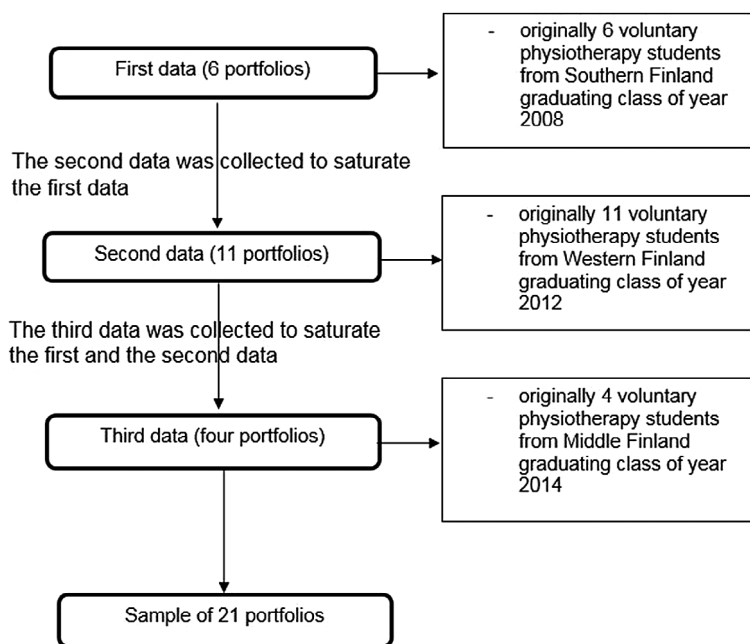
The study had a qualitative approach to obtain knowledge of physiotherapy students' conceptions of learning practical work. Students were building their identities as emerging professionals in their portfolios. They wrote about themselves as learners, gradually becoming physiotherapy community members. Workplaces are strongly present in students' stories and they tell a lot about their participation in different actions in real work (Bruner, 1987; Deppermann, 2013).

### *Data collection and participants*

This study is part of a wider research project that concentrates on the healthcare teacher education. This article focuses on the students' view in learning practical work in their professional development. The data was gathered from physiotherapy students' portfolios during the whole three-and-a-half-years of study.

The data was collected in 2008, 2012 and 2014 from three different higher education institutions from different parts of Finland. Longitudinal data was collected over the course of three and a half years in all institutions. Students wrote portfolios during their whole study time. The data consists of 2002 typewritten A4 pages of their own learning experiences. They wrote about subjects including *What kind of a learner am I?* and *My professional development*. The writing consisted of students' free narration. Students wrote their portfolios every six months, exploring their learning experiences and feelings. Finally, the portfolio consisted of a single report of their study time. The data consisted of portfolios from 21 volunteer students studying in different parts of Finland (Figure 1).

Twenty-one 22- to 37-year-old students (mean age 25 years), who finished their studies in 2008, 2012 and 2014 participated in the study. Three of the students were male and 18 were female. Participants were selected from those educational institutions where portfolios were written during the whole study time. Physiotherapy units were contacted and with the help of teachers, a meeting was scheduled in which graduating students were told both orally and in writing about the study. After the meeting, volunteer students gave the researcher their portfolios, which the researcher copied for herself. In one educational



**Figure 1.** Study design and sampling flow chart.

institution, the students sent their e-portfolios to the researcher via email. Other portfolios were scanned to the same external hard drive. Four students had earlier experience of higher education. Two had studied at university. Five had graduated from vocational upper secondary education, four as practical nurses and one from the catering branch. Five had also been masseurs in their previous profession. Eighteen students out of 21 had taken the matriculation examination. All students had work experience from both childcare and elderly care and some of them also had experience in instructing physical activity groups. In addition, some students had work experience in other branches (Appendix 1).

Permission for the study was requested from educational institutions as well as the students themselves. Participation in the study was voluntary.

## Analysis

Thematic analysis was used to analyse the data. The theme in the analysis includes something that is essential to the research question and it aims to show different points of view regarding the central themes of the research (Braun & Clarke, 2006; Guest, MacQueen, & Namey, 2012, pp. 10–11). The portfolios were read many times to obtain a sense of the whole. After this, narratives were written about every student. Every student's writing – segments in sentences or chapters – about practical learning were collected (A–U, 21 students) and analysed without the researchers employing any previously stated frames and premises. The results, i.e. the themes, were derived from the data via an abstraction process from the content area (Graneheim & Lundman, 2004). Key themes from the texts were identified and coded appropriately. Thematic analysis needs interpretation from the researchers (Guest et al., 2012, pp. 17). Three researchers took part in analysing the data, two of them experienced PhD

**Table 1.** Practical work in physiotherapy (PT) students' learning process.

| Main theme and learning phases  | Key themes and subthemes                |  |
|---------------------------------|---|--|
| Learning practical work         | Learning work agency and practices      | Learning physiotherapy competence                  |
| Basis of the work               | Motivation to study practical work      | Enthusiasm for professional development to be a PT |
| Meaning of the work             | Observation of the PT professional work | Interaction with real clients                      |
| Wholeness of the work           | Belonging to the work community         | Instruction and examination at work                |
| Critical reflection on the work | Developing a working life               | Clinical reasoning                                 |
| Widening the work               | Informal learning in different contexts | Widening the work culture                          |

researchers, the third a PhD student. A process of reflection and discussion resulted in agreement on themes. The relationships between the themes and phases can be seen in Table 1. The results include direct citations from the research material. The researchers were not working in the organizations where data was collected, but each of them has experience of the healthcare education area. The themes that arose from the data are described and reported in more detail in the results section below. Learning practical work was categorized into five phases and into two key themes, both of which consist of five sub-themes (Table 1).

## Results

When starting professional study, students generally considered practical ways of learning and instructed practical training periods to be important from the perspective of learning and professional development. Generally, students wanted more practice. Information was learned by a variety of learning at school and in the workplace.

Themes attached to practical learning clearly emerged, and they are described in more detail in the following section. The main theme, *learning practical work*, was formed in the analysis. It describes the whole turning point in studying. The basis of the profession was learned at school. The central themes for learning practical work were *human movement and action* and *therapeutic tools*. Theoretical knowledge was integrated into practical ways of studying. After the basis of the work was learned, the students needed a real client and also a real workplace to deepen their learning. Tacit and situational knowledge had an essential role in learning in real work contexts. Key themes for learning practical work sharpened in *learning physiotherapy competence* and *learning work agency and practices*. Reflection and feedback were needed in all learning.

There were also sub-themes attached to the key themes. Sub-themes in learning work agency and practices consisted of motivation to study practical work, observation of professional physiotherapy work, belonging to the work community, developing a working life and informal learning in different contexts. Sub-themes in learning physiotherapy competence consisted of enthusiasm for professional development, interaction with real clients, instruction and examination at work, clinical reasoning and widening the work culture.

### ***Basis of the practical work learned at school***

#### ***Studies of their own branch attached students to the physiotherapy profession***

The students eagerly awaited starting the physiotherapy branch studies. They gained a new kind of enthusiasm for their professional development. They gradually got the chance to

make use of physiotherapeutic working methods. Practical observation of human movement and action were interesting experiences.

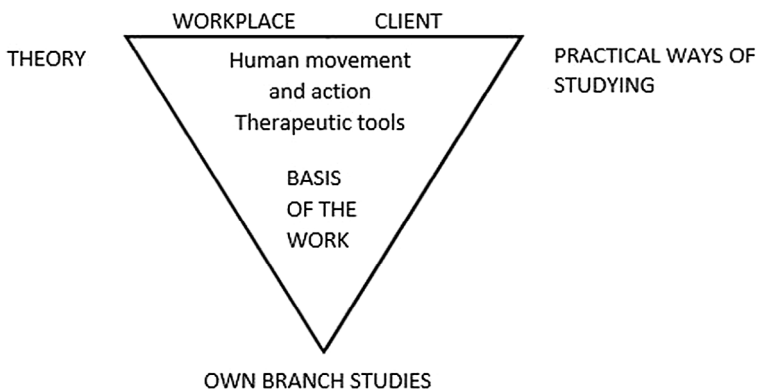
### ***A wish for more practical ways to study***

*Practical lessons* were generally thought to be useful and more of them were wanted, for example transition exercises and practice tests. Students got new ideas for practical work but they also learned a lot of new information, which they would use as the basis for all work (Figure 2). They could also apply the theoretical knowledge learned earlier to their practice. New practical skills were constructed based on previous knowledge. Knowledge was deepened and more was learned about the tools for better functioning. Students also liked taking a practical test as a way of completing the course because they could show learning in a different way than in writing. In addition, feedback of their accomplishment was immediate.

Other *practical ways of studying* were generally praised by the students. *Functional seminars* where students got to try different kinds of treatments in practice were considered interesting and good learning experiences. The students also learnt a lot in *case tutorials* because concrete examples of real patients were used in them. Theoretical knowledge, problem solving and reasoning were connected to practical themes and were discussed with peers and teachers. These cases also helped students in instructed practical training because they saw that real people have the same problems, which they had studied at school theoretically. *Days for practical instruction, testing and exercise* were also experienced as beneficial to learning; in particular, the stories students heard gave new perspectives on their practical work. Before the actual instructed training periods started, *meetings with clients* were experienced to teach a great deal about the physiotherapy process.

### ***Work agency and work processes were learned in real workplaces***

Students felt that it provided variety to their study to get into a workplace. They encountered new experiences, information, viewpoints and aspects for their professional development. Courses to do with physiotherapists' own branch of work were found to be important and practical lessons at school were useful, but many students thought that it was actually at



**Figure 2.** Basis of the practical work at school.

the workplace that they started to understand the content better. Students' theoretical knowledge deepened and extended through practice. Issues were also easier to remember with the help of concrete situations. Experiencing real work also strengthened their career choice to become physiotherapists.

Tacit and situational knowledge of the physiotherapy and rehabilitation sector were learned in real work situations. In the first practical training students concentrated on evaluating their own practical skills and agency with clients. Gradually they also started to see rehabilitation from the clients' point of view and gave responsibility to the clients in their rehabilitation. Themes that arose from real work for their practical learning were understanding the work agency and practices and understanding the physiotherapy process. Getting feedback and reflection was important in all learning. Expertise was learned in a variety of ways at work, which will be explained in more detail below.

### ***Learning work agency and practices***

The role of the *physiotherapy profession*, and rehabilitation and health sector generally, took shape *by observing real work*. At the first workplace students learned a lot by following how professional physiotherapists worked. Students paid particular attention to customer-orientation and how therapists respected clients' feelings and life situations. Professionals also supported and encouraged clients and were assertive. Gradually students' understanding about various aspects that affect rehabilitation deepened. By following clients' holistic rehabilitation, they gained knowledge about care paths and multi-professional rehabilitation. Observations in different environments widened their tacit knowledge about the different roles physiotherapists had with different patient groups and placements.

First instructed practical training went well in every sense and there was enough interesting stuff to be followed. I believe I have got quite a varying picture about the activities in a healthcare centre and particularly about physiotherapy, as varying as one can get during two weeks. (G3)

*Gradually deepening participation in work practices* increased a sense of belonging to the physiotherapy community and beyond it. Step-by-step independent survival in the workplace became more of a goal for the students. If workplace personnel trusted students to take care of their own share of the work and communicated openly, it increased belonging to the work community. When students were familiar with the therapy methods used in the workplace they could concentrate on their agency at work better. Some students had the opportunity to participate in a multi-professional rehabilitation team, which increased their understanding of the rehabilitation sector. *Learning by developing in working-life projects* inspired development activities for the physiotherapy branch. Students became enthusiastic about developing new kinds of action in cooperation with working life. Being in a project was regarded as hard work and students threw themselves into it with full energy. They learned management, organization, delegation and entrepreneurship generally. The role of networking became important and students gained the courage to discuss their experiences with others.

Practical work processes became more secure *by informal learning*. Some students gained practical experience by doing paid work during the study time. Some students instructed sports groups, some massaged and many students had summer jobs before their graduation. Students' practical work experiences helped their professional development and also gave valuable experience for meeting clients. Students learned to plan, implement and evaluate the work processes and take more responsibility for their own work.

### **Learning physiotherapy competence**

The professional identity and the meaningfulness of the profession started to develop when *facing real clients*. Understanding the totality of the human being and considering situational circumstances were understood by the end of the studies. As a result, facing diversity in people and communicating with them became easier. Communication skills, verbal and non-verbal interaction, listening, good senses and the ability to be present in a situation were needed. Physiotherapy students understood meeting the client as a part of the physiotherapy process.

My professional identity started developing in the first instructed practical training. The patient, a counterpart of every physiotherapist, and comprehensive facing of him was needed for it. After this experience the meaningfulness of the whole profession opened up. Here one is in touch with real and concrete, literally tangible things. (H11)

The wholeness of the practical work started to form when *observing clients functioning, participating in the examination and progressing through the physiotherapy process*. It was important to understand clients' functioning and feelings. Examination skills got better by practising at work. Advancing the physiotherapy *process* and self-confidence for students' practical skills got better *by learning by doing*. *Instruction skills*, manual, oral as well as visual, also developed through practice. Students wanted to learn how to motivate, encourage and support their clients for better outcomes. However, some students experienced that they could still be more vigorous and demanding in their instructions in order to achieve the intended development in physiotherapy. At the same time students had to consider their clients' life situations.

During both the instructed practical trainings I noticed how important the role of the physiotherapist is as the supporter of the rehabilitation of the patient. It is important to encourage and be assertive enough so that the goals can be achieved. (Q2)

Students were generally timid in using manual instruction at the beginning of the studies. Manual skills developed gradually by practising, especially in those workplaces that specialized in that branch. *Variability of the exercises* and the use of different kinds of therapeutic tools increased through practice. The use of different therapy methods became easier in the later part of the studies after understanding the wholeness of physiotherapy.

My own 'exercise bank' has grown since the instructed practical trainings started, which adds to the flexibility in physiotherapy situations; if one exercise does not for some reason succeed, I have some other exercise in mind, which helps in achieving goals. (S5)

*Reporting skills* developed through practising understanding the situational needs. Students learned how to report essential issues during therapy visits and to compile statistics. Nevertheless, students had to concentrate on writing and on what was appropriate to report in certain situations.

My writing/reporting skills have also developed in a direction appropriate to reporting even though I sometimes still notice that I have to stop to think how to say things in a way that they make sense, and at times my reporting could be even more accurate. (T26)

*Clinical reasoning* – thinking skills, constructing and evaluation – was done simultaneously with the actual practical work. Figuring out the real problem with real customers felt interesting. At work students also started to understand why clients acted the way they did. Examination situations needed planning, because many things had to be considered. Students practised how to synthesize the collected information from clients and they learned to construct a physiotherapy diagnosis.

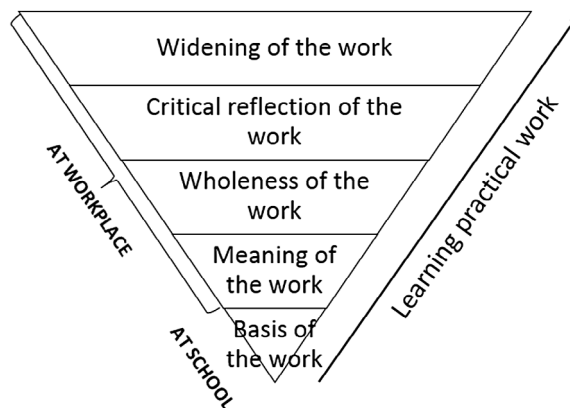
I had to take into consideration the client's ability to act and move and build up the physiotherapy diagnosis in the client report so I had to particularly observe this information during the normal physiotherapy situation. (U14)

Students also practised how to construct appropriate goals for physiotherapy and they gradually became more realistic in it. Setting little goals forwards helped to create the belief that the client would be able to act independently, step by step. When learning to make concrete goals it was easier to choose suitable therapy methods. Rationalizing why certain exercises needed to be done was experienced as challenging. The clinical reasoning and evaluation process got easier towards the end of the study time when students had enough information about different client groups and their ongoing rehabilitation as well as practical experience of physiotherapy.

*Experiencing an international instructed practical training period* widened the understanding of the physiotherapy process. Different habits and different treatments were used in practice in different countries and students got new points of view on their own work. In addition to new therapy methods, students learned communication skills, openness and their self-confidence increased. They developed and matured as human beings, because they had survived in a foreign culture. They could manage in different situations in the future.

## Summary

Learning practical work proceeds in five phases in the socialization process for the physiotherapy profession. In conclusion (see Figure 3), the results of the study are combined from the following key themes: learning work agency and practices, and learning physiotherapy competence. In Phase 1, the basis of the practical work is learned at school; learning physiotherapy competence, work agency and practice develops at real work. In Phase 2, the meaning of the practical work takes shape in interactions with clients and by observing how real physiotherapists work. Phase 3 focuses on the wholeness of the profession, which takes shape through gradual participation in physiotherapy work practices by observing, participating *in* and practising examination and instruction. Phase 4 focusing on critical reflection on the practical work – thinking, construction and evaluation – develops by getting experience of clinical reasoning and working life projects. Phase 5 on the conception of



**Figure 3.** Learning phases for physiotherapy practical work.

physiotherapy practical work widens through gaining international and informal work experience.

Reflection and getting feedback were important in all learning in this study. It was important for students to be welcomed to the workplace and to get *feedback* on their work. Feedback helped students to develop their practical skills. A positive attitude towards the students, explaining issues and discussing with them as well as replying to their questions were considered important. Students were grateful for guidance, instruction, tips, getting new perspectives and for their instructors sharing their experiences and latest knowledge with them. *Reflection* on the experiences was also understood to be educational. Especially towards the end of the studies, the meaning of reflection was better understood. Reflection was done by writing portfolios during the whole study time, but mostly it was done during the instructed practical training periods.

Students experienced that their physiotherapy education had been intense, but they had learned a lot. Students were waiting for graduation, but the transition to working life felt exciting. There still seemed to be a lot to learn. After a long period of studying students were, however, satisfied with their achievements. On the verge of the graduation, the students had adopted an attitude to lifelong learning. It was always possible to learn something new and become a better expert. Students were ready to enter the world of work and turn into professionals in the physiotherapy work.

## Discussion

Students reflected deeply upon their practical work in their portfolios and it was to a large extent their educative goal to learn to practice physiotherapy as a profession in real working life. Students' professional identity and expertise, i.e. their funds of practice (Esteban-Guitar, 2012), were built in real work situations and through cooperation between school and working life (Lähteenmäki, 2006; Laitinen-Väänänen, 2008; Piirainen & Viitanen, 2010). Approximately one third of the education programs are implemented in real work contexts (Mämmelä, 2015; Ministry of Culture & Education, Finland, 2006). This study showed that maybe a lot more about the physiotherapy profession and practical work is actually learned in different work contexts. Tacit and situational knowledge plays a huge role in physiotherapy students' professional development. This is not to underestimate the role of the schools and curricula, since all the basics of practical work, the 'hearth' of the profession – human movement and action and therapeutic tools – are still learned at school.

Öhman et al.'s (2002) approach to learning practical work has a similar base to this research, whereby learning practical work and the tacit knowledge of the profession with the help of a socialization process takes place in different placements during a student's education.

Their own branch studies attached students to the physiotherapy profession. The basis of the practical work was learned by the integration of theory and practical ways of learning. At this stage the conceptual and theoretical understanding (Tynjälä & Gijbels, 2012; Virtanen et al., 2009) started to develop, but the understanding deepened in real work in the later phases of learning practical work. At the curriculum level, integrative pedagogy is needed to consider the needs and starting points of the students and also to understand the requirements and practices of working life (Tynjälä & Gijbels, 2012; Tynjälä et al., 2014, 2016). It is important to understand how adults learn (Knowles, 1980) and how important a role work plays in their lives (Billett et al., 2006, Watkins et al., 2014). Thus, learning needs to be seen

more than just a series of situations. As Lindeman (1926/1989, p. 121) has stated, 'education is life' for adults. That is why these stories of becoming professionals have huge meaning for the individuals who participated in this study (see Cranton, 2006).

For learning practical work further, real situations with real patients and real workplaces were needed. The meaning of the profession took shape by facing real clients and observing how professionals worked. In addition, the picture of the rehabilitation and healthcare sector was built by following the clients' care paths in real work situations. Bartlett, Lucy, Bisbee, and Conti-Becker (2009) report that professionalism and communication develop at the beginning of physiotherapists' socialization process in real work. Students recognized the importance of developing trust with clients through communication. First practical experiences awakened many emotions for students and the emotions were linked to self-confidence, which could not be that high while performing practical work at this stage (Bartlett et al., 2009). Direct involvement with patients is regarded as a quality experience (Morris, 2007). By listening to clients' life stories and interacting with them, students gradually found it easier to understand clients' different life situations and recognize diversity in people.

The wholeness of the physiotherapy practical work was understood by gradually participating in the work practices (Wenger, 1999). Knowing how to do physiotherapy work independently was key to being accepted in the work community. Participating in workplaces means engaging in learning work, which includes individual learning but also the remaking of cultural practices that comprise their work (Billett et al., 2006). Those two dimensions of learning work were also seen in physiotherapy students' stories. They concentrated on developing their own practical skills, but at the same time they were learning work agency and practices. Workplace practices and circumstances directed students' learning (Eteläpelto et al., 2013; Evans et al., 2006; Higgs, 2013). For learning physiotherapy competence, students practised by doing different tasks at work and the variety of the therapeutic tools increased at real work. Gradually students learned the habits and tools professionals used in different situations and developed a tacit knowledge and working culture (Wenger, 1999). Work agency was individual-oriented at this point and students focused on their own learning (Harteis & Goller, 2014). At this stage, students' practical skills and competences developed, including specific skills needed in physiotherapy and also generic skills needed in working life (Virtanen et al., 2009). Students also had a more active role in managing their emotions in order to build their self-confidence, which increases when studies in practical work take place (Bartlett et al., 2009; Wessel & Larin, 2006).

Critical reflection on practical work became easier after students had gained experience. Clinical reasoning in the physiotherapy process and participation in working-life projects developed students' thinking, construction and evaluation skills. Evaluation of the process was experienced as difficult and practical experience and theoretical knowledge of the different client groups were needed in order to learn to evaluate clients' progression. Students were generally enthusiastic in developing work practices in cooperation with working life and they learnt valuable skills like entrepreneurship and planning their own work. Learning by developing in projects involving work agency was more externally oriented and the focus was on developing and creating new work practices (Harteis & Goller, 2014). At this stage, students' self-regulative skills developed (Virtanen et al., 2009).

Students' understanding of practical work widened with their wider experience from different workplaces. Non-curricular experiences and different workplaces for instructed practical training increased the students' preparedness for working life (Atkinson & McElroy,

2016; Bennett & Hartberg, 2007). Experiencing a practical work period abroad widened the conception of the physiotherapy process because different tools and habits were used in therapy in different countries. In addition, communicating in a foreign language and understanding different cultures taught openness in interaction. Students also gained experience informally by doing paid work and their work processes became more secure. They learned to take more responsibility for their practical work. In all conceptual and theoretical understanding, practical skills and competences and self-regulative skills became more fluent and it was possible for practical work to be done independently in changing circumstances (Virtanen et al., 2009). Inter-professional training also widens understanding of the healthcare sector. It is important to cooperate in real working life (Lindh Falk, Hammar, & Nyström, 2015).

Students' learning of physiotherapy practical work in cooperation with school and working life was connected to the socialization process of the working culture of the profession and also to the culture of each workplace. In a professional socialization process, students gradually learned tacit, situational and informal knowledge, habits, tools, values, loyalties (Bartlett et al., 2009; Öhman et al., 2002, Richardson, 1999), professional identity, hidden structures and tacit cultural dynamics of the profession (Hammond, Cross, & Moore, 2016). Students need to learn physiotherapy competences and work practices in different workplaces and also learn accepted behaviours of the profession before their agency at work develops to be independent and secure. Work agency is still developing during their education. Students need to go through the socialization process in the profession in order to learn independent practical work in physiotherapy.

### **Conclusions and clinical implications**

Learning practical work proceeds in five phases in the socialization process for the physiotherapy profession: (1) basis of the work; (2) the meaning of the work; (3) the wholeness of the work; (4) critical reflection on the work; and (5) widening of the work. Feedback and reflection are needed in all phases.

The study brings new information about learning practical work for developing healthcare education and its curricula. The role of the workplace is huge in learning tacit knowledge of the profession, which is essential to the practical work in physiotherapy.

### **Ethical issues**

There was a desire to recognize students' own conceptions and own 'voices' about learning practical work. The portfolio process during the study time gave students a tool for their reflection and for becoming aware of their own learning process (Bakhtin, 1981; Braun & Clarke, 2006; Guest et al., 2012).

The progress of the analysing process has been described consistently. Researchers have also taken care to obtain enough observations about the studied phenomenon. The results were derived from the data and include direct citations of the research material. The results of the study were discussed with the theories used and also with previous studies from the subject (see Tong, Sainsbury, & Craig, 2007).

Participation in the study was voluntary and permission for the study was requested from both educational institutions and the students themselves. The anonymity of the participants has been maintained during the whole process and that is why the students' real names

were not used in this study. Good ethical principles are used in the study and it has a research permit from the University of Jyväskylä and additionally from the other higher education institutions.

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No potential conflict of interest was reported by the authors.

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## Appendix 1

**Table A1.** Education and work experience of the participants.

| Sex (f/m)    | Age (years) | Earlier education   | Working experience (years) | Year of graduation |
|--------------|-------------|---|----------------------------|--------------------|
| Anna, f A    | 29          | <ul style="list-style-type: none"> <li>• matriculation examination</li> <li>• 3 years of studying in a university of technology</li> </ul>      | 10                         | 2008               |
| Eeva, f B    | 25          | <ul style="list-style-type: none"> <li>• vocational upper secondary education (catering branch)</li> <li>• masseur</li> </ul>                   | 5                          | 2008               |
| Liisa, f C   | 34          | <ul style="list-style-type: none"> <li>• matriculation examination</li> <li>• vocational upper secondary education (practical nurse)</li> </ul> | 7                          | 2008               |
| Tiina, f D   | 22          | <ul style="list-style-type: none"> <li>• vocational upper secondary education (practical nurse)</li> </ul>                                      | 2                          | 2008               |
| Kaija, f E   | 24          | <ul style="list-style-type: none"> <li>• matriculation examination</li> </ul>   | 1                          | 2008               |
| Minna, f F   | 27          | <ul style="list-style-type: none"> <li>• matriculation examination</li> <li>• vocational upper secondary education (practical nurse)</li> </ul> | 5                          | 2008               |
| Maria, f G   | 22          | <ul style="list-style-type: none"> <li>• matriculation examination</li> </ul>   | 1                          | 2012               |
| Sonja, f H   | 37          | <ul style="list-style-type: none"> <li>• matriculation examination</li> <li>• MPhil</li> </ul>  | 12                         | 2012               |
| Anni, f I    | 22          | <ul style="list-style-type: none"> <li>• matriculation examination</li> </ul>   | 1                          | 2012               |
| Emmi, f J    | 24          | <ul style="list-style-type: none"> <li>• matriculation examination</li> </ul>   | 1                          | 2012               |
| Hannele, f K | 22          | <ul style="list-style-type: none"> <li>• matriculation examination</li> </ul>   | 1                          | 2012               |
| Satu, f L    | 23          | <ul style="list-style-type: none"> <li>• matriculation examination, half a year of nursing studies</li> </ul>                                   | 1                          | 2012               |
| Antti, m M   | 23          | <ul style="list-style-type: none"> <li>• matriculation examination</li> </ul>   | 1                          | 2012               |
| Päivi, f N   | 24          | <ul style="list-style-type: none"> <li>• upper secondary vocational education (practical nurse)</li> <li>• sports masseur</li> </ul>            | 3                          | 2012               |
| Merja, f O   | 25          | <ul style="list-style-type: none"> <li>• matriculation examination</li> <li>• few months of study for community health nurse</li> </ul>         | 3                          | 2012               |
| Johanna, f P | 23          | <ul style="list-style-type: none"> <li>• matriculation examination</li> <li>• sports masseur</li> </ul>   | 1                          | 2012               |
| Aleksi, m Q  | 23          | <ul style="list-style-type: none"> <li>• matriculation examination</li> </ul>   | 2                          | 2012               |
| Seija, f R   | 25          | <ul style="list-style-type: none"> <li>• matriculation examination</li> <li>• masseur</li> </ul>  | 1                          | 2014               |
| Jaana, f S   | 28          | <ul style="list-style-type: none"> <li>• matriculation examination</li> </ul>   | 5                          | 2014               |
| Anselmi, m T | 23          | <ul style="list-style-type: none"> <li>• matriculation examination</li> </ul>   | 1                          | 2014               |
| Susanna, f U | 23          | <ul style="list-style-type: none"> <li>• matriculation examination</li> <li>• sports masseur</li> </ul>   | 1                          | 2014               |