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Practical knowledge of preservice physical education teachers: Content and influence of acculturation

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Abstract:

The objective of this exploratory study was to identify the content of preservice teachers' practical knowledge and the influence of their acculturation experiences on their practical knowledge. Informed by teacher occupational socialisation theory, a mixed method design was used to examine 26 first-year preservice physical education and health (PEH) teachers' practical knowledge construction during their first PEH course. Data collection included a written assignment in which the preservice teachers, based on their learning experiences during the PEH course, were asked to describe 10 significant didactical milestones (DMs) (practical knowledge) that would guide their future teaching in PEH. The early stage of teacher socialisation, their acculturation phase, was examined and analysed by using a questionnaire gathering information about their background and previous experiences. Results showed that the content of these preservice PEH teachers' practical knowledge was mainly pedagogical and focused most often on instructional strategies. The preservice teachers showed a relative lack of focus on knowledge concerning curriculum aims and contextual issues related to school and society. Furthermore, the results showed significant individual differences in the content of their practical knowledge. Consequently, we must acknowledge that acculturation and professional socialisation of individual preservice teachers will not be similar and that there is fundamentally multifaceted interaction between the structure of teacher education, different stages, and content. Teacher educators need to consider the complexity between individual learning experiences and the importance of how the content is organised in a differentiated approach.

Key words: practical knowledge, occupational socialisation, teacher education, physical education.

Introduction

Teacher cognition research is, at the moment, closely related to teacher education practice, with the main focus to support teacher learning (Borg, 2015), and there has been an attempt to understand what teachers know and how that knowledge is constructed (Carter, 1990; Tsangaridou, 2006). There is a strong focus on the complexity of teacher cognitions, where knowledge and beliefs are seen as inseparable: beliefs are more regarded as a personal component and referring to individual values, attitudes, and ideologies, whereas knowledge is seen as a content-related component with a focus on teachers' more factual propositions (Meijer, Verloop, & Beijaard, 2001; Witterholt, Goedhart, & Suhre, 2015).

The concept of teacher knowledge has over time expanded and broadened significantly, however with a focus on the personal aspects of knowledge (Ben-Peretz, 2011). Several researchers focused their research on teachers' practical knowledge (Clandinin, 1986; Elbaz, 1981) since the practical context is also central for teachers (Black & Halliwell 2000). When practical knowledge is constructed by teachers in the context of their work, it integrates experiential knowledge, formal knowledge, and personal beliefs (van Driel, Beijaard, & Verloop, 2001). In Elbaz seminal work, (1983, 3) she described that teachers' practical knowledge refers to "the complex sets of understanding which teachers actively use to shape and direct their teaching", a definition also adopted in this study.

According to Verloop, Van Driel, and Meijer (2001) practical knowledge is an overarching, inclusive concept that includes a variety of mental processes, from conscious and well-balanced opinions to unconscious and unreflected insights that are grounded in teachers' actions in practice. They pointed out that "in the mind of the teacher, components of knowledge, beliefs, conceptions, and intuitions are inextricably intertwined" (Verloop et al., 2001, 446). Studies have shown that teachers' practical knowledge can have a real impact on instructional decisions and actions in teaching PEH (Rovegno, 1995; Tsangaridou, 2002).

Educational researchers have identified several features for practical knowledge. First, it is person specific, which arises from teachers' experience and background, teacher education, and reflection (Berliner, 2004; Black & Halliwell, 2000; Elbaz, 1991; Fenstermacher, 1994). Secondly, the context plays a central role in shaping teachers' practical knowledge in understanding the situation-specific nature of teaching and learning

(Ben-Peretz, 2011; Connelly & Clandinin, 1985; Rovegno, 2003). Finally, practical knowledge is often tacit or implicit knowledge, and teachers are not always able to articulate their practical knowledge (Berliner, 2004; Borg, 2015; Elbaz, 1991). These features can be seen in how Siedentop and Tannehill (2000) noted that physical education (PE) teachers with strong practical knowledge can convert their knowledge about the content into actual instructional practices in a complex situation.

Although teachers' practical knowledge is strongly related to personal experiences and individual situations, there are structures of teachers' practical knowledge, which are shared by many teachers (Gatbonton, 2008; Verloop et al., 2001). Researchers have identified categories of teachers' practical knowledge in general education as (a) subject matter, (b) students, (c) student learning and comprehension, (d) purposes, (e) curriculum, and (f) instructional techniques (Verloop et al., 2001; Witterholt et al., 2015). In relation to preservice teachers' practical knowledge, researchers have structured the content in somewhat different ways (Buitink, 2009; He, Levin, & Li, 2011; Levin & He, 2008; Maaranen, Pitkäniemi, Stenberg, & Karlsson, 2016; Pitkäniemi, Karlsson, & Stenberg, 2014). However, our review of these studies shows that they have used similar themes, such as teachers, teaching and instructional activities, classroom context, students, sociocultural aspects, and curriculum. Furthermore, Buitink (2009) noted that preservice teachers' with well-developed practical knowledge showed richness in content, coherence in structure, focus on students' learning processes, and awareness of underlying principles of teaching.

During teacher education programmes, preservice teachers develop their thinking about teaching and learning in PE (Pike & Fletcher, 2014). Therefore, we need to know more about the knowledge they construct and which knowledge will guide their future behaviour in the gym (Elbaz, 1983). It is also important to know which underlying principles of teaching and learning can be found in their practical knowledge, that is, what the practical knowledge is about (Verloop et al., 2001). Therefore, this study was about teacher learning during PE teacher education (PETE). Although PE preservice teachers' learning has been the focus in several studies (Graber, 1996; Tsangaridou, 2006), none has specifically addressed their learning in the form of practical knowledge during initial teacher education. Accordingly, the objective of this exploratory study was to identify the content of preservice PEH teachers' practical knowledge from participation in learning activities. Practical knowledge has person- and context-specific features, such as preservice teachers' background and experiences, which have a profound influence on how they understand and enact teaching and learning to teach. Therefore, and encouraged by other scholars (Richardson, 1996; de Vries, Jansen, Helms-Lorens, & van de Grift, 2015; Herold & Waring, 2011), the second objective was to obtain information about the influence of their previous acculturation on their practical knowledge.

Theoretical framework

As the process of preservice teacher knowledge integration is guided by teachers' personal experience, occupational socialisation will serve as the theoretical framework in this study. Research in teacher socialisation is generally attributed to understanding the processes whereby an individual teacher becomes an active member of the society of teachers (Zeichner & Gore, 1990). Consequently, teacher socialisation research exposes the social, psychological, and political dynamics of working as a teacher as well as agencies and mediators of the socialisation (Templin & Richards, 2014). Based in teacher socialisation theory (Lortie, 1975), occupational socialisation theory represents one theoretical perspective that provides an understanding of why teachers think about and teach PE as they do (Lawson, 1983a, 1983b; Schempp & Graber, 1992). Teacher socialisation is conceptualised by phases of acculturation, professional socialisation, and organisational socialisation (Richards, Templin, & Graber, 2014). These phases reflect the influence before teacher education, during formal teacher education, and during work socialisation in schools, respectively (Pike & Fletcher, 2014; Richards et al., 2014; Schempp & Graber, 1992; Templin & Richards, 2014).

Early socialisation or acculturation begins at birth and reflects childhood and adolescent participation in and experiences of PE and sport, where they are influenced by family, friends, teachers, and coaches. Through this "apprenticeship of observation" (Lortie, 1975) preservice teachers develop their beliefs, values, and understandings of what it means to be a PE teacher (Schempp & Graber, 1992; Templin & Richards, 2014), and this is an important time in their development. Professional socialisation begins when preservice teachers enrol in a teacher education programme, where they, over the course of several years of formal studies, are expected to gain PE knowledge, start to think and act as a physical educator, and develop a professional identity for the school context (Pike & Fletcher, 2014; Templin & Schempp, 1989). The last phase, organisational socialisation, is the workplace socialisation that occurs on the job and is ongoing (Richards et al., 2014); it will, however, not be attended to in this study.

Scholars have employed occupational socialisation theory as a reference point to study how innovative pedagogical practices are implemented in teaching PE. While most preservice teachers are unfamiliar with such curricular frameworks, there is a unique opportunity to identify how factors within occupational socialisation are realised in the beliefs and actual teaching of preservice PE teachers. Most researchers have, through a case study approach, focused on one or two teachers (e.g., preservice or recently qualified teachers) (Deenihan & MacPhail, 2013; McMahon & MacPhail, 2007; O'Leary, 2014; O'Leary, Longmore, & Medcalf, 2014; Romar, Ahlroos, Flykt & Penttinen, 2015; Stran & Curtner-Smith, 2009), while others have studied four to 13 teachers (Li &

Cruz, 2008; Curtner-Smith, Hastie, & Kinchin, 2008; Sutherland & Stuhr, 2014). These different research approaches and settings will, of course, lead to somewhat conflicting results, although a general conclusion would support that the influence of professional socialisation during PETE can have a significant impact on teachers implementing innovative pedagogical practices. In addition, researchers have reported how the influence of occupational socialisation differs between teachers in the same study, emphasising the person-specific features in teacher thinking and actual teaching (Curtner-Smith, Hastie, & Kinchin, 2008; Romar et al., 2015; Sutherland & Stuhr, 2014).

Above described studies have investigated both teachers' cognition and actual teaching through observations and interviews. Moy, Renshaw, and Davids's (2014) focus was on a group of 49 preservice teachers' beliefs, and they found that recruits possessed very strong teaching beliefs focused on custodial, traditional, and reproductive PE games. This supports Lawson's (1983a, 1983b) socialisation theory of acculturation that previous school and sporting experiences are powerful influences on preservice teachers' initial beliefs about PE teaching practice. They noted that preservice teachers developed a significant, meaningful change in beliefs towards the constraints-led approach during a unit within a research-informed pedagogical framework. However, preservice teachers' acculturation, that is, the level of success in sports, influenced their receptiveness to the alternative pedagogical approach, where preservice teachers with a background of limited achievement in competitive sports were significantly more receptive. In addition, Adamakis and Zounhia (2016) studied preservice teachers' beliefs regarding PE outcome goals with a cross-sectional investigation. They concluded that the PETE programme did not seem to affect preservice teachers' beliefs and athletic level and time spent in sports did not influence the results. In addition, international research has shown that preservice teachers' personal school PE experiences as students and a physically active background were linked to their perceived competence and attitudes towards teaching PE (Morgan & Bourke, 2008; Morgan & Hansen, 2008; Penttinen, 2003; Valtonen, Autio, Reunamo, & Ruismäki, 2012; Webster, 2011).

Acculturation from teaching and coaching experiences was also positively correlated with preservice teachers' intentions to teach PE and perceived teaching strengths (Penttinen, 2003; Valtonen, Hirvensalo, Reunamo, & Ruismäki, 2014). Kari (2016) reported recently that preservice teachers' previous physical activity experiences were reflected in their development as PE teachers during the PETE programme. Thus, once preservice teachers enrol in a teacher education programme, they filter new understanding through their preformed conceptions. Levin and He (2008) found that acculturation experiences have a strong influence on preservice teachers' beliefs about the classroom context and about teachers. Therefore, studying previous acculturation experiences that contribute to their professional learning will develop our understanding of teachers' learning processes.

Method

Context of the Study

The preservice teachers in this study were enrolled in a five-and-a-half-year PETE programme (330 European Credit Transfer System [ECTS]) in the north of Sweden. The programme consisted of general education studies, studies of two school subjects, sequential practicums, and a final research project. During their first semester of the programme, the preservice teachers had an introduction to the teacher profession and general education studies (30 ECTS) together with other subject preservice teachers.

During the second semester of the TE programme, when data for this study was collected, the preservice teachers studied their initial PE semester. The PETE programme (90 ECTS) was covered over the course of three semesters and consisted of PE and health (PEH), nutrition and health, and sport medicine. The overall aim of the PETE programme was to educate teachers in the subject matter and prepare the preservice teachers to teach PEH at all levels in school but with a special focus on upper secondary school. PE subject matter and pedagogy were integrated and taught in three courses (one in each semester) which emphasised the application of teaching the content at the upper secondary school level: Leadership for Learning in Physical Education and Health (18 ECTS); Body, Knowledge, and Health (15 ECTS); and Teaching and Learning in Physical Education and Health (22.5 ECTS).

The first PE course was cotaught by five teacher educators (8 to 32 years of teacher education experience), of which two had a doctoral degree. This course was framed around three main areas; practical experiences, leadership training and seminar sessions. The practical experiences involved participation in the outdoors and adventure, invasion ball games, and rhythmic movement activities through the idea of "live and learn". Leadership skills were emphasised through one peer-teaching and one regular teaching assignment where the preservice teachers also had to observe and reflect on instructional principles and apply their teaching to selected literature. In addition, seminar sessions with focus on observation as a research method, ethnicity, and teaching styles were included in the course.

Teacher education in PE has recently received some attention among Swedish scholars. Backman and Larsson (2014) analysed curriculum documents and highlighted a decontextualisation of knowledge that contributes to knowledge reproduction in future PE teachers and a lack of critical reflection on their practice. Other researchers (Larsson, 2009; Maivorsdotter, Lundvall, & Quennerstedt, 2014) noted that preservice

teachers have a strong focus on the practical parts during PETE. Finally, Backman and Pearson (2016) studied teacher educators' work with practical movement skills and pointed out a dualistic position held by the teacher educators. Therefore, to receive a comprehensive view of PETE in Sweden, preservice teachers and how they learn need to be included in the knowledge construction (Backman & Pearson, 2016).

Participants and Data Collection Methods

The study was an exploratory study with a mixed-method design, and it included 26 first-year preservice PE teachers. Among the participants, 10 were female, and 16 were male, with a mean age (22.8 ± 3.9 years) representative of a typical PETE cohort at the university. The data collection included a written assignment in which the preservice teachers, based on their experiences during the study course, were asked to describe 10 significant didactical milestones (DM) (practical knowledge) that would guide their future teaching in PEH (Elbaz, 1983). In order to obtain information on the preservice teachers' backgrounds and acculturation experiences, they also completed a questionnaire. The data were not collected only for research purposes, as it was also the first step in the process of encouraging preservice teachers to reflect on learning in the form of their practical knowledge.

Written Assignment

Before the written assignment, the preservice teachers were informed that a DM was defined as a thought, theory, or philosophy that the preservice teachers believed could guide their future work as a teacher in PEH. We also explained that a DM was an example of practical teacher knowledge, defined as the teacher's knowledge of teaching and practical challenges, and could thus be seen in meaningful actions. The aim of this process was for students to try to make implicit learning explicit and to give students the possibility to reflect on coursework in the form of structuring their practical knowledge. The students were also instructed that each DM should have a heading and a short description of what the DM meant for them. During the course (12 weeks), students had a chance to ask questions and were reminded several times to write down DMs as they appeared and not to leave the work to the last week (day) of the study course. While previous studies on preservice teachers' practical knowledge and beliefs have used a survey instrument to collect data from all participants during one specific occasion (Adamakis & Zounhia, 2016; Buitink, 2009; Levin & He, 2008; Maaranen et al., 2016; Pitkaniemi et al., 2014), He, Levin, and Li (2011) suggested that other data collection methods could be useful. So, informed by Black and Halliwell (2000), our intention was that preservice teachers should in writing construct their practical knowledge along with the coursework.

Questionnaire

The areas treated in the questionnaire were based on previous research on the acculturation phase in the occupational socialisation theory in PE (Adamakis & Zounhia, 2016; Elliot et al., 2013; Ferry & Lund, 2016; Morgan & Bourke, 2008; Valtonen et al., 2014) and examined the preservice teachers' backgrounds and acculturation experiences.

The questionnaire was divided in five sub areas related to their acculturation. The items on *family sport socialisation* included questions on the amount of parental support at age 12 (parents attending training and competitions) and how much their family (father, mother, siblings) had influenced their sport and physical activity habits. *School success* included items about their upper secondary PEH grade and upper secondary average grade merits. Items on *sport background* considered their participation in school sports, highest sport level, and the type and extent of club sports experiences. *PEH experiences* included items about their perceived athletic ability in relation to peers and their perceptions of PEH and the PEH teacher in school. Finally, the items related to *teaching and coaching experiences* included their teaching and coaching experiences as well as formal coaching education.

Descriptive statistics for the preservice teachers' acculturation are reported in Table 1. The data show that among the preservice PE teachers, a higher proportion were male, many were supported by their family at age 12, and they perceived that their sports and physical activity habits had been influenced by their family. They had relatively high grades in PEH, they had participated in relatively many sports, most had participated in both individual and team sports, and there was great variation in the highest attended sport level. Moreover, they perceived themselves as better in PEH compared to peers, some of them had practical experience as coaches or teachers, and many had no or only some formal coaching education.

Data Analysis

Written Assignment

The preservice teachers' DMs were analysed both qualitatively and quantitatively in order to derive a more comprehensive picture of the data. The qualitative analysis involved identifying the content of their milestones and categorising them on the basis of common themes and categories. The quantitative analysis noted the frequency of the identified themes and categories. A content analysis of all 260 DMs was conducted to identify themes and categories to describe the content. Content analysis is used to analyse data within a specific context in view of the meanings someone attributes to them (Krippendorff, 1989). The data analysis started by segmenting the documents according to their milestones and giving each a label to reflect its content. During this initial phase, author 1 and author 2 read all DMs to sort heading, words, and phrases into conceptual categories

for further coding. Preliminary categories were modified and refined jointly to establish linkages and relationships between and among emerging categories. The development of coding categories involved an iterative process that entailed considering relevant literature about theories on teaching and learning processes in classrooms and exploring the data. Seventeen categories were identified for the DMs based on our initial open coding. These categories were generated from the DMs, and discrepancies were resolved through negotiation between the two authors. At this stage, a coding manual also was created with category labels and specific examples from the data for each category. Finally, to identify the relationship among the categories, we compared the coding labels to related literature on teachers' practical knowledge. Five new themes were identified that seemed similar to common aspects of teaching described in previous research (Buitink, 2009; Levin & He, 2008; Maranen et al., 2016; Schwab, 1983; Stenberg et al., 2014). These were the curriculum (what) that is taught by the teacher (who) through instructional strategies (how) to the students (whom) in the classroom (where). The first two authors then used the final 17 categories to recode all the DM data.

Table 1: Preservice Teachers' Backgrounds and Acculturation Experiences

Variable		Categories	n	%	Sign.*
Sex	Sex	Men	16	61.5	n.s.
		Women	10	38.5	
Family sport socialisation	Parental support at age 12	Low	3	11.5	$p < .05$
		Medium	8	30.8	
		High	15	57.7	
	Family influence on sport and PA habits	Low	4	15.4	n.s.
		Medium	11	42.3	
		High	11	42.3	
School success	Average grade merits	Low (10–13.75)	7	26.9	n.s.
		Medium (13.76–17.50)	9	34.6	
		High (17.51+)	10	38.5	
	Grades in PEH	Low (Pass)	2	7.7	n.s.
		Medium (Pass with distinction)	6	23.1	
		High (Pass w. special distinction)	18	69.2	
Sporting background	Attended school sports	Yes	14	53.8	$p < .05$
		No	12	46.2	
	Sporting extent	Low (Participated in 0–2 sports)	13	50.0	$p < .05$
		Medium (Participated in 3–4 sports)	10	38.5	
		High (Participated in 5–6 sports)	3	11.5	
	Type of sports	None	1	3.8	n.s.
Individual sports		2	7.7		
Team sports		9	34.6		
Both individual and team sports		14	53.8		
None		1	3.8		
Highest sport level	Low (Club sport or district)	10	38.5	n.s.	
	Medium (Regional)	5	19.2		
	High (National or international)	10	38.5		
PEH experiences	Self-perceived ability in PEH	Low	5	19.2	$p < .05$
		Medium	9	34.6	
		High	12	46.2	
	Perception of PEH and PEH teacher in school	Bad	4	15.4	n.s.
		Medium	14	53.8	
		Good	8	3.8	
Teaching and coaching experiences	Practical experience as teacher or coach	None	15	57.7	$p < .05$
		Some	5	19.2	
		Extensive	6	23.1	
	Formal coaching education	None	11	42.3	n.s.
		Some	12	46.2	
		Extensive	3	11.5	

* A comparison of preservice teachers' five DM themes in relation to their acculturation experiences with Chi-square test, n.s. = non-significant.

Several steps were taken to ensure the credibility and trustworthiness of our DM data and the analysis. To prevent socially desirable answers and expectance effects, we used documents the preservice teachers produced as part of the study programme, and they did not have to do additional work for this study. The documents were not used for assessment purposes, and they were graded as "pass" when they were turned in regardless of the content. All data were analysed after the preservice teachers had completed this course in order to minimise the grading power. The DMs were coded independently by the first and second authors and placed in one of the 17 categories. Initially, the coders had 78% intercoder reliability. All conflicts were resolved collaboratively by discussing the heading and content of the milestones, and a consensus was reached with regard to coding the few discrepant DMs.

Questionnaire

IBM SPSS Statistics, version 23.0, was used for the statistical analyses. In the comparisons of the preservice teachers' five DM themes in relation to their acculturation experiences, Chi-square tests were used. In

cases where there were not enough responses for each item option to perform a Chi-square test, the item options were merged. The significance level was set at 5% ($p < .05$).

Findings

In order to answer both research questions, this part is divided into two sections. Firstly, with regard to the content of the preservice teachers' practical knowledge, the data show a typology of different content in their practical knowledge, which shows how preservice teachers make personal interpretations of formal course knowledge and develop their own teaching pedagogies for school contexts. Secondly, in order to analyse the influence of their acculturation experiences, previously identified variables were compared with the content of the preservice teachers' practical knowledge.

The content of the preservice teachers' practical knowledge is presented according to five themes, of which the *Curriculum* had 16 DMs that were related to the importance of the school subject and how it is structured (see table 2).

The theme *Teacher* was found in 76 DMs that addressed being a professional teacher, teacher development, teacher content knowledge, and being sensitive in student interactions. In the theme *Instruction*, we identified 88 DMs that described how teachers apply and adapt content and activities, teacher planning and flexibility, teaching methods, lesson structure, clear task presentation, and teacher feedback. In the theme *Students*, 39 DMs were combined into three categories that described including every student, being sensitive to all students, and a student-centred learning approach. Finally, the theme *Classroom*, with 41 DMs, focused on teachers' work in classrooms to create a supportive climate, to enhance motivation, and to maintain control. Most of these preservice teachers' practical knowledge as measured by DMs was related to instruction (33.7%) and the teacher (29.1%), while the fewest number of DMs were about curriculum (6.5%) (see table 3). The themes *Students* (15.0%) and *Classroom* (15.7%) generated similar percentages of all DMs. With regard to individual categories, the preservice teachers' practical knowledge was most often concerned with being a professional teacher (40 DMs), who can apply and adapt teaching content (29 DMs) and similarly enhance student motivation (21 DMs).

For the second objective of this study, to obtain information about the influence preservice teachers' previous acculturation experiences had on their practical knowledge, the analysis showed significant differences for some items (see table 1). Preservice PE teachers with high parental support at age 12 showed a higher proportion of DMs in the themes *Instruction* and *Curriculum*. Those who had attended sport schools had a higher proportion of DMs categorised in the theme *Classroom*, and those who had not attended had higher proportions of DMs in the theme *Instruction*. Furthermore, preservice PE teachers with a low sporting extent had a higher proportion of DMs in the themes *Curriculum* and *Classroom*, whereas those with a higher extent showed a higher proportion of DMs in the themes *Instruction* and *Teachers*. Preservice teachers having a high self-perceived ability in PEH compared to peers reported a higher proportion of DMs categorised as *Instruction* and *Teachers*. Finally, preservice teachers with teacher and coaching experiences had a higher proportion of DMs in the themes *Curriculum* and *Students* compared to those with no practical experience as a teacher or coach.

Even though we identified some general categories of practical knowledge and a few significant acculturation differences, the content of their practical knowledge on an individual level showed a large variation. For a specific preservice teacher and with regard to the content of their teachers' practical knowledge, the categories in figure 1 show a typology of different content structure in three preservice teachers' practical knowledge.

Acculturation data show that Maria and Simon (pseudonyms) had similar profiles. Their earlier acculturation had a strong association with sports and a sporting career, and Simon is still active in his sport. However, the influences from their former PE teachers differed. Maria had positive experiences with her PE teachers, whereas Simon was more modest about his former PE experiences and questioned his teacher's subject matter knowledge. For each preservice teacher, the quality of their practical knowledge differed in terms of what they saw as important. While Simon mainly expressed practical knowledge towards the theme *Instruction*, which focusses on the actual teaching situation and how to organise, adjust, and instruct, Maria's pattern showed a broader spectrum, where the teaching climate, as well as her role as a teacher, received more attention. Josef, on the other hand, had a background that completely differed from most of the students in this group. With no prior involvement or interest in sports, as well as with negative experiences and perceptions of his former PE teachers, he seemed, however, to have appreciated the subject during upper secondary school. His practical knowledge was focused on his role as a *Teacher*, where teacher development, professionalism, and the links to the curriculum were central.

Table 2. Categories of Content of Practical Knowledge about what, who, and whom (DMs)

Categories	No.	%	Examples of practical knowledge
What (Curriculum)	17	6.5	
<i>Curriculum, steering documents</i>	17	6.5	<ul style="list-style-type: none"> * PEH teachers need to show adolescents how important this [PEH] is and what are the consequences of a sedentary lifestyle. * Each lesson should have a clear purpose and goal. * The subject is called physical education and health, but my experience is that 90% is about sports. The health part is forgotten.
Who (Teacher)	76	29.1	
<i>Subject matter knowledge</i>	11 14.5%*	4.2	<ul style="list-style-type: none"> * Knowledge of the child's maturity, development, and learning is important. * That teachers do not know how it is performed with the correct technique. I myself have experienced this in other subjects, and I completely lost respect for the teacher. * The teacher should be interested and acquire knowledge in different areas in order to be an expert in more than his own leisure activities.
<i>Teacher development</i>	15 19.7%*	5.8	<ul style="list-style-type: none"> * Develop my leadership in all different areas. This is so that I do not end up on the same old track after a few years as a teacher. * I, as a teacher, do not want to get stuck in old patterns; rather, [I] want to dare to try new things all the time to become a better educator. * Always reflect on and evaluate my own work. What was good and what was not so good and why.
<i>Professionalism</i>	40 52.6%*	15.3	<ul style="list-style-type: none"> * To be able to work with appropriate? language, both in class and beyond. * Show engagement. Show students that you think it is fun and really believe in what you do. * PEH teacher is your job, not your hobby.
<i>Personal & private</i>	10 13.2%*	3.8	<ul style="list-style-type: none"> * To be able to be personal with students but not private. * Being personal will lead to students gaining trust in me. * That you actually should not be a friend to your students but, in fact, a teacher.
Whom (Students)	39	15.0	
<i>Inclusive intentions</i>	15 38.5%*	5.8	<ul style="list-style-type: none"> * Always conduct the lesson so that everyone is included and can participate even if they have different abilities. * It is the teacher's job to include everyone in each subject, but it is particularly important when you have a subject like PEH. * Try adapted sports (for disabled persons).
<i>Attention to all students</i>	13 33.3%*	5.0	<ul style="list-style-type: none"> * During every lesson, ensure that each student feels that they are seen by me. * Not favouring and instead try to create an education that is as equal as possible for all students. * As a teacher, I think it is important to not focus on only certain students, but all should be seen.
<i>Student-centred approach</i>	11 28.2%*	4.2	<ul style="list-style-type: none"> * To be able to appreciate the student and to dare to listen to what s/he has to say, instead of believing that I know better. * Working in pairs and giving students tools so they can observe their partner and so they can help each other. * To be receptive to students and listen to their suggestions for changes.

* = percentage of DMs within the theme

Table 3. Categories of Content of Practical Knowledge about how and where (DMs)

Categories	No.	%	Examples of practical knowledge
How (Instruction)	88	33.7	
<i>Planning and having a plan B</i>	15 17.0%*	5.7	<ul style="list-style-type: none"> * Plan the lessons carefully so that students do not have to stand and wait. * It does not always go as you intended; have the courage to change from your initial plan. * Plan, have many options, be prepared if what you planned does not work.
<i>Lesson structure</i>	11 12.5%*	4.2	<ul style="list-style-type: none"> * Gather the group before the lesson and inform them of what will happen during the lesson. Gather them after as well. * Time-out during team games. I see this as an important part. One or more times during gameplay, you should stop and let the students talk about a new strategy. * Make sure that the warm-up is carried out so that students are warm before the actual activity starts.
<i>Clear instructions</i>	11 12.5%*	4.2	<ul style="list-style-type: none"> * When the teacher explains what to do for a group, avoid walking with the students as a group to each station. * To be able to give good instructions for each activity, so that everyone understands. * You can prevent a lot of irritation and inefficiency by being very clear in explaining the lesson content.
<i>Methods</i>	13 14.8%*	5.0	<ul style="list-style-type: none"> * Something that I myself will work on and try to strive to develop is to know which method is the best [in each] situation. * Guide your class in the right direction instead of standing and controlling and just pointing out what students should do. * Reciprocal Method: Take advantage of the experts in the class.
<i>Adapt and adjust lesson content and activity</i>	29 33.0%*	11.1	<ul style="list-style-type: none"> * Progressions during the lesson. You can start simple and basic and then increase the challenge during the lesson. * Learning by playing. Let students learn through play, not only through skill practice. * Break down exercises; make them different but with the same/similar rules.

<i>Feedback</i>	9 10.2%*	3.5	* Give students a lot of feedback. Help students develop by giving them feedback. * Provide feedback to the students. This is needed to be able to feel motivated and that they should be able to develop. * Encouragement and praise is for me an obvious ingredient in teaching.
Where (Classroom)	41	15.7	
<i>Classroom climate</i>	12 29.3%*	4.6	* Create a positive atmosphere during PEH classes, and create an environment where students feel that it is acceptable to make “errors”. * All students should be able to feel safe during PE lessons. * To create a pleasant environment for students so that they feel motivated to participate in the lessons.
<i>Arousal of motivation</i>	21 51.2%*	8.0	* A teacher is responsible and obligated to help and motivate students. * Not all students appreciate that it often is about competition during lessons because they feel they are not at the same level. * To initiate some sort of motivation for the students, so they find interest in playing sports outside [school].
<i>Clear</i>	8 19.5*	3.1	* Dare to be determined, therefore, to be determined/strict but in a nice way. * Of course, one should not be mean and unfriendly with the students, but you have to dare to be authoritarian and decide, if it comes to it, to show who’s the boss. * I absolutely believe that students need to feel that there are expectations for the students.

* = percentage of DMs within the theme

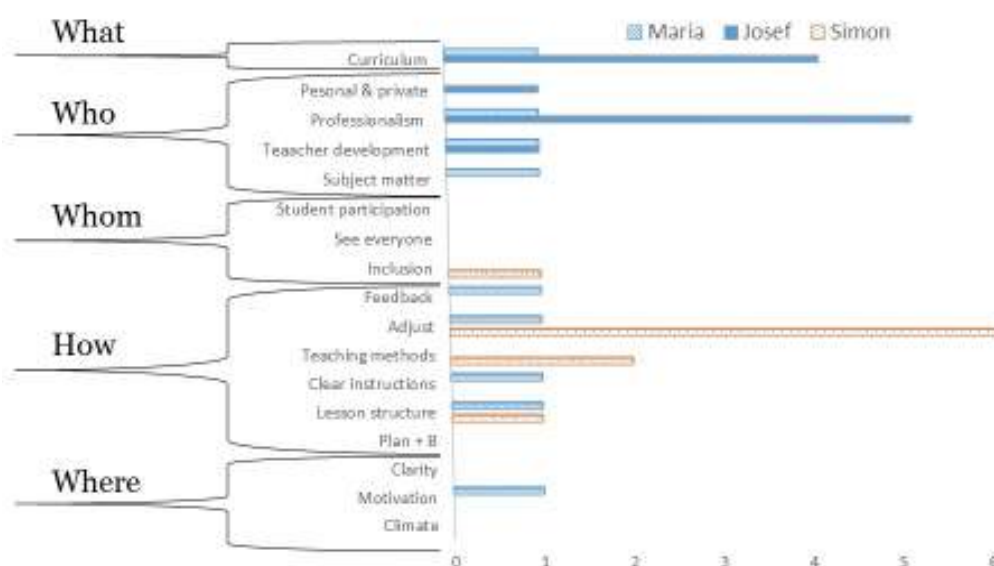


Fig. 1. Comparison of three students' practical knowledge (DMs)

Discussion

The purpose of this study was to identify the content of preservice teachers' practical knowledge from participation in learning activities and to obtain information about the influence of their previous acculturation on their practical knowledge. To identify preservice teachers' practical knowledge, the approach in this study was to ask them to write down important conclusions made during their first PEH semester and then for us to comprehend from their accounts the content of practical knowledge as expressed in their written DMs. Qualitative as well as quantitative data analyses were used. The qualitative analyses allowed us to identify categories describing the preservice teachers' practical knowledge. The quantitative analyses yielded numerical information useful for comparing and contrasting similarities and differences within this group of preservice PE teachers. Together, these two methods generated an in-depth understanding that would have been impossible with either analysis alone. The understanding of the extent to which the fundamental principles of teaching and learning are part of a student teacher's practical knowledge will assist teacher educators in realising what is learned during the teacher preparation programme. Therefore, we were interested in the content of preservice teachers' practical knowledge, or in other words, what their practical knowledge is about.

As a whole group, the content of these preservice PE teachers' practical knowledge was mainly pedagogical and focussed most often on instructional strategies for delivering the curriculum followed by the roles and responsibilities of the teacher, student qualities and interactions, and finally, the general classroom environment. Clearly, less emphasis was placed on curriculum issues. This result is in line with previous research findings in general education (Levin & He, 2008; Maaranen et al., 2016), which concluded that preservice teachers' practical knowledge was related to planning, instruction, and organisation, classroom management, the qualities of a good teacher, and their knowledge about who students are. Buitink (2009) also noted that preservice teachers' practical knowledge showed a coherent structure, richness in content, a focus on student learning processes, and awareness of essential principles of teaching, while Stenberg et al. (2014) found

that practical knowledge mostly focused on the pedagogical interaction between teacher and student. Research in PETE has also reported that PE teachers had strong and well-articulated curricular, pedagogical, and social theories about teaching and student learning (Tsangaridou & O'Sullivan, 2003). Similarly, Graber (1995) noticed a focus on general pedagogical knowledge that guided preservice PE teachers when managing and organising classes, disciplining students, motivating students, instructing, and providing feedback. Conversely, the themes and categories in this study indicate that teacher practical knowledge represents a complex range of understanding (Elbaz, 1983).

Given the fact that preservice teachers' practical knowledge is rooted in their personal context (Van Driel et al., 2001), our findings support Verloop et al., (2001) conclusion that shared components of teachers' practical knowledge can be found among teachers from a similar context. Additionally, the themes and categories identified in this study are also in line with the practical knowledge categories defined by Meijer et al. (2002) (subject matter knowledge, student knowledge, knowledge of student learning and understanding, knowledge of purposes, knowledge of curriculum, and knowledge of instructional strategies). However, these shared components showed for each individual preservice teacher a separate pattern, as Cheng et al. (2014) also reported personal differences in preservice teachers' pedagogical understanding with a case study approach.

At this early phase of their professional socialisation, these preservice teachers had already acquired or were in the process of acquiring practical knowledge that was easily recognisable as connected with the act of teaching. In terms of teacher education, the preservice teachers in this study had completed their first PEH course. In addition, they had one semester of general teacher education studies together with other subject matter preservice teachers. In terms of teaching experience, they had two microteaching assignments in the PE course. However, because no preliminary assessment was included in the study, it is unclear if they already had started their teacher education programme with initial knowledge about teaching PE (cf. Ralph & MacPhail, 2014). Nevertheless, the majority of the preservice teachers' practical knowledge focussed on pedagogical issues related to teachers and their students. This indeed is a central part of the teaching profession and, particularly, teaching PE (Tannehill, van der Mars, & MacPhail, 2015). Accordingly, many preservice teachers situated themselves as teachers at the beginning of their teaching education. This is a promising finding: that preservice teachers' practical knowledge is connected to the teaching process and the role of the teacher. At this time of their teacher education, they must make a shift from recently being students to now starting to think and act as a teacher (Borg, 2003; Flores & Day, 2006). The first logical step might be what is seen in this study, to start to focus on the role of the teacher as well as how to instruct and motivate students in PEH.

In addition to identifying certain basic properties of teaching and the teacher role at the beginning stage of teacher education, an analysis of the content of practical knowledge revealed a low focus on subject matter knowledge. It seemed that preservice teachers considered "how to teach" more important than "what to teach". Research in PETE has typically indicated that preservice teachers and teacher educators perceive subject matter knowledge to be highly valued (Backman & Pearson, 2016; Larsson, 2009; Maivorsdotter et al., 2014) and that deficits in subject matter knowledge had implications for their confidence in teaching (Herold & Waring, 2009). In this study, there was more of a focus on how to apply and adapt teaching content to motivate their learners, which might come from the assignment, where preservice PE teachers had to construct their practical knowledge. However, a DM was defined as a thought, theory, or philosophy that preservice teachers believed could/should guide/direct their future work as a teacher in PE, which still is rather broad and can include a variety of topics of practical knowledge.

The missing link, or what is not evident in their practical knowledge, is also an important result. The preservice teachers in this study showed a relative lack of focus on knowledge concerning curriculum aims and contextual issues related to school and society. This study clearly adds to the existing literature, especially in regard to the absence of practical knowledge related to how the curriculum and wider school context issues are related to teachers' work (Herold & Waring, 2011; Pitkäniemi et al., 2014; Stenberg et al., 2014). This finding clearly indicates that these preservice teachers were at the beginning phase of their professional socialisation. In addition, there was a complete lack of focus on assessment, an area that recently has been identified as challenging for PE teachers by several international researchers (Borghouts, Slingerland, & Haerens, 2017; Leirhaug & MacPhail, 2015; Tolgfors & Öhman, 2016). In summarising these missing links by preservice teachers in this study, there is a need for further development of preservice teachers' individual practical knowledge by moving from instructional and pedagogical issues to a more comprehensive understanding of how education and the wider aims of education relate to the teaching profession.

The second objective was to analyse how the acculturation phase was connected to preservice teachers' practical knowledge. Our results show, similar to previous studies, that those who enter the PETE programme generally have had positive experiences of PE in school and are interested in and enjoy sport and physical activity (Capel et al., 2011). Furthermore, although the study was exploratory and only included 26 first-year preservice PE teachers, the results show that their acculturation phase influenced their practical knowledge in teaching PEH. Acculturation factors such as family sport socialisation, sport background, PEH experiences, and teaching and coaching experiences were connected with the contents of their practical knowledge. The results indicate that acculturation experiences were most frequently noticed in the themes *Instruction* and *Curriculum*; however, in order to explain these patterns in depth, further and larger studies are needed.

On a general level, findings from the quantitative analysis of practical knowledge and acculturation gave only minor support to previous socialisation research in general education (Morgan & Bourke, 2008; Morgan & Hansen, 2008; Penttinen, 2003; Valtonen et al., 2012; Webster, 2011). However, we were not interested in preservice teachers' perceived competence, beliefs, or attitudes towards teaching but rather in their learning in the form of the development of practical knowledge during this PEH course. This is a major difference compared to previous research where acculturation factors have been connected to various educational constructs, measured on one occasion through a paper and pencil test. Nonetheless, the preservice teachers' learning processes displayed substantial individual differences in the content of their practical knowledge. These personal differences support the notion that teachers' practical knowledge is person specific based on previous experiences and background (Berliner, 2004; Elbaz, 1991; Fenstermacher, 1994). The small sample is a limitation of the study, and a larger sample could perhaps have provided a different result. A conclusion would be that, because of the personal nature of preservice teachers' practical knowledge, it has been difficult to make generalisations about the influence of acculturation based on case studies (Deenihan & MacPhail, 2013; O'Leary, Longmore, & Medcalf, 2014; Romar et al., 2015; Stran & Curtner-Smith, 2009), and for larger studies, it is challenging to collect and analyse different constructs in order to present any trends or patterns (Adamakis & Zounhia, 2016; Moy et al., 2014).

According to Borg (2015), teachers' practical knowledge is dynamic and therefore defined and redefined through educational and professional experiences during teachers' lives. Research also indicates that teaching experience in different school contexts as well as additional time in teacher education influences teachers' learning and development (Ingersoll, Jenkins, & Lux, 2014; MacPhail, Tannehill, & Goc Karp, 2013; Richards & Templin, 2011), so this study shows only preservice teachers' practical knowledge at the moment when these data were collected. Another limitation was that the study was carried out in one teacher education department with one student group. Therefore, future studies should investigate more students from different programmes and even from a different context. To receive a deeper understanding of the development process of practical knowledge, researchers also need, through a qualitative approach, to examine how and why preservice teacher knowledge construction is stimulated. In addition, the understanding of teacher development during teacher education would improve by investigating how preservice teachers' practical knowledge matures during the whole teacher education programme as well as during teaching practice.

Conclusions

Overall, this study not only provided an understanding of the initial learning and the shared content of preservice teachers' practical knowledge but also showed the person-specific knowledge construction of individual preservice teachers. These findings will help teacher educators broaden their understanding, which similarly might enhance the quality of PETE. Preservice teachers need time and opportunities to be engaged in learning opportunities which primarily affect their future work. Therefore, the contents and structure of teacher education need to be understood and developed as a sequence during the whole teacher education programme when learning is a continuous process. In addition, teacher educators must recognise and attend to early acculturation experiences, so prior beliefs and thoughts are not only reinforced during the teacher education programme. Because acculturation experiences will influence preservice teachers' practical knowledge and thereby inform their decision making, teacher educators need to consider how to guide the reflection and action process where previous experiences are analysed and discussed. This process should be implemented during all courses to integrate meaningful learning experiences.

Finally, whereas we must acknowledge that acculturation and teacher education experiences of individual preservice teachers will not be similar as well as the fundamentally multifaceted interaction between these different stages, teacher educators need to consider structure, content, and learning experiences that are organised in a differentiated approach. This is a challenge, but it would mean that preservice teachers can and must individualise their study programme based on previous experiences. Our own learning experiences are evident in how we need to deliberately and progressively work with missing issues in the future courses with the group of preservice teachers that participated in the study. We will also search for possibilities to adapt our programme and give students different options. In addition, we also plan to continue using the practical knowledge process with DMs in our programme as a way to promote reflection and enhance learning.

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