DISSERTATION FROM THE
NORWEGIAN SCHOOL OF
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2018

Mats Hordvik

Developing as a teacher educator

Using self-study of teacher education practices as a pedagogy for professional development: A rhizomatic consideration

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Mats Hordvik

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Summary

Professional development of teacher educators is deemed important for both teacher education and the educational system as a whole, emerging as a hallmark for what it means to become and learn as a teacher educator.

This doctoral thesis aims to add to research on processes of teacher educator professional development. Particularly, the purpose is to investigate my teacher education teaching and research practice. That is, I consider the processes of a beginning teacher educator's practices, experiences, contexts and knowledge construction. The following research question evolved from the research process, "How does a teacher educator negotiate his teaching and research practice as he develops professionally?"

I used the self-study of teacher education practices methodology together with rhizomatics (a nonlinear philosophy that emphasizes relationships among a multitude of interacting components in a given social situation) to provoke, challenge, and illuminate readers' thinking about teacher educator professional development. Particularly, I used the rhizomatic concepts of "assemblage" to generate different thinking about the relational and constantly evolving processes of my professional development.

Specifically, this doctoral project examines a beginning teacher educator's teaching and research practice as I aimed to develop my personal pedagogical skills and knowledge for teaching pre-service teachers and become research active. This examination involved two interrelated layers. One layer was composed of four physical education teacher education courses (two content courses and two school placements) divided into five phases. Data were generated over a 17-month period and included video and audio of my teaching, my reflective diary, pre-service teacher focus groups and in-depth interviews, and pre-service teacher coursework. The other layer focused on the actual research process. Data were generated over the four-year doctoral period and included audio data from meetings with my supervisors.

This doctoral project highlight the ways multiple human (i.e., the teacher educator, the pre-service teachers, the school students, the cooperating teachers) and non-human elements (i.e., the specific content, the national, program and course tradition) combine and interact, co-producing teacher educator practice and pre-service teachers' school placement experiences. While study I and study II conveyed that human and non-human elements influence practice, study III and study

IV conveyed the way these elements combined and interacted. Further, study V highlighted the nonlinear and fundamentally relational process of constructing understanding in self-study of teacher education practices.

I discuss my professional development by drawing on examples from the studies and the concept of “assemblage”, and argue that teacher educators are part of a constantly evolving assemblage that co-produce different practice, pedagogy, and learning. To help readers acknowledge my lines of thinking, I begin by looking at the connection and interaction between the five studies. Second, I discuss the ways assemblage functioned as two layers in this doctoral project: classroom-assemblage and research-assemblage. Third, I discuss the process of the interrelated relationship of teacher education pedagogy, considering the processes of interaction between the pre-service teachers and myself, and the ways non-human elements influenced the relationship. Finally, I discuss the non-linear and ever-evolving learning as a teacher educator.

I suggest a decentered conceptualization of teacher educators that posits them as prominent figures who, although influenced by a variety of elements and forces, are engaged in continuously steering or “orchestrating” practice towards desired outcomes. Subsequently, I introduce the notion of orchestration and try to develop it as a means to conceptualize teacher educator practice.

I argue that this doctoral thesis shows that self-study of teacher education practices represents a valuable methodology to strengthen teacher education programs. That is, it has the potential to both improve the individual teacher educators’ practice as well as the international understanding of teacher education.

Keywords: Physical education teacher education, preservice teacher education, Deleuze, practitioner inquiry, qualitative research, teaching about teaching, learning about teaching, Sport Education.

Sammendrag

Profesjonell utvikling for lærerutdannere anses å være viktig for både lærerutdanning generelt og utdanningssystemet som helhet. Profesjonell utvikling fokuserer på hva det betyr å bli og lære som lærerutdanner.

Dette doktorgradsprosjektet tar sikte på å styrke forskningen som belyser prosesser i en lærerutdanners profesjonelle utvikling. Hensikten var å undersøke min undervisnings- og forskningspraksis som lærerutdanner. Konkret betyr dette å undersøke prosessene til en lærerutdanners praksis, erfaringer, kontekster og kunnskapsutvikling. Det følgende forskningsspørsmål ble utviklet i forskningsprosessen: "Hvordan forhandler en lærerutdanner sin undervisnings- og forskningspraksis som en del av hans profesjonelle utvikling?"

Jeg brukte selvstudiet-metodologien sammen med rhizomatics (en ikke-lineær filosofi som legger vekt på samspillet mellom en rekke komponenter i en gitt sosial situasjon) for å utfordre lesernes tenkning om lærerutdanneres profesjonelle utvikling. Jeg brukte det rhizomatiske konseptet "assemblage" (Ensemble, samvirkende helhet) for å generere tenkning om relasjonelle og stadig utviklende prosesser i min profesjonelle utvikling.

Dette doktorgradsprosjektet undersøker en ny lærerutdanners undervisnings- og forskerpraksis med mål om å utvikle mine personlige pedagogiske ferdigheter og kunnskaper for å undervise lærerstudenter, og bli forskningsaktiv. Prosjektet involverte to sammenknyttede lag. Ett lag besto av gjennomføring og utforskning av fire lærerutdanningskurs (to fagligpraktiske kurse og to skolepraksiser) delt inn i fem faser. Data ble generert over en 17-måneders periode, og inkluderte video og lyd av min undervisning, min reflekterende dagbok, fokusgrupper og dybdeintervju med studentene, samt deres mappeinnleveringer. Det andre laget fokuserte på den faktiske forskningsprosessen. Data ble generert over den fireårige doktorgradsperioden og inkluderte lydopptak fra møter med mine veiledere.

Dette doktorgradsprosjektet fremhever hvordan menneskelige elementer (dvs. lærerutdanneren, studentene, elevene, praksislærerne) og ikke-menneskelige elementer (dvs. det spesifikke innholdet, den nasjonale tradisjonen, og program- og kurstradisjonen) interagerte, og sammen produserte lærerutdannerens undervisnings- og forskningspraksis, og studentenes erfaringer fra skolepraksis. Mens studie I og studie II formidlet at menneskelige og ikke-menneskelige elementer påvirker praksis, formidlet studie III og studie IV måten disse

elementene kombinerte og interagerte på. Videre formidlet studie V at kunnskapsutvikling i selvstudie metodologien er en ikke-lineær og fundamentalt relasjonell prosess.

Jeg diskuterer min profesjonelle utvikling ved å bruke eksempler fra studiene og konseptet ensemble, og hevder at lærerutdanneren er en del av et konstant utviklende ensemble som samspiller i produksjonen av forskjellig praksis, pedagogikk og læring. Jeg begynner med å se på sammenhengen og samspillet mellom de fem studiene. Deretter diskuterer jeg hvordan ensemble fungerte som to lag i dette doktorgradsprosjektet: klasserom- ensemble og forsknings-ensemble. Jeg diskuterer så de relasjonelle forholdene innenfor lærerutdanningspedagogikk, hvor jeg fokuserer på samspillet mellom studentene og meg selv, og hvordan ikke-menneskelige elementer påvirket samspillet. Til slutt diskuterer jeg min ikke-lineære og konstant utviklende læring som lærerutdanner.

Jeg foreslår en desentrert konseptualisering av lærerutdannere hvor de blir sett på som fremtredende figurer som, selv om de er påvirket av en rekke elementer, er engasjert i å kontinuerlig styre eller "orkestrere" praksis mot ønskede resultater. Deretter introduserer jeg begrepet orkestrering og prøver å utvikle det som et verktøy for å konseptualisere lærerutdanneres praksis.

Jeg argumenterer for at dette doktorgradsprosjektet viser at selvstudie representerer en verdifull metodologi for å styrke lærerutdanningsprogrammer. Det vil si at det har potensial til å både forbedre den enkelte lærerutdanners praksis, samt den internasjonale forståelsen av lærerutdanning.

Nøkkelord: Faglærerutdanning i kroppsøving og idrettsfag, lærerutdanning, Deleuze, praktikerforskning, kvalitativ forskning, undervise om å undervise, lære om å undervise, Sport Education.

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Study I

Hordvik, M., MacPhail, A., & Ronglan, L. T. (2017a). Teaching and learning Sport Education: A self-study exploring the experiences of a teacher educator and pre-service teachers. *Journal of Teaching in Physical Education*, 36(2), 232-243.

Study II

Hordvik, M., MacPhail, A., & Ronglan, L. T. (2017b). Learning to teach Sport Education: Investigating a pre-service teacher's knowledge development. *Sport, Education and Society*. doi:10.1080/13573322.2017.1322948

Study III

Hordvik, M., MacPhail, A., & Ronglan, L. T. (Under review, submitted December 13, 2017). Developing a pedagogy of teacher education using self-study: A rhizomatic examination of negotiating learning and practice. *Journal of Teacher Education.*

Study IV

Hordvik, M., MacPhail, A., & Ronglan, L. T. (Under review, submitted January 3, 2018). Encountering the reality of teaching Sport Education: The experiences of pre-service teachers while on school placement. *Physical Education and Sport Pedagogy.*

Study V

Hordvik, M., MacPhail, A., Tannehill, D., & Ronglan, L. T. (Accepted, September 4, 2017). Decentering the 'self' in self-study of professional practices: A working assemblage. In K. Strom, T. Mills, & A. Ovens (Eds.), *Decentering the researcher-subject in intimate scholarship: Complex, materialist, and posthuman methodological perspectives*: Emerald Books.

INTRODUCTION: "COMING INTO COMPOSITION" WITH THE DOCTORAL THESIS

Teacher education provides education for the teaching profession that essentially concerns handling uncertainties in a knowledgeable and competent way (Smith, 2011). The main aim of teacher education is to educate pre-service teachers (i.e., prospective teachers, student teachers) in "understanding the problematic nature of teaching, how that influences teaching and learning about teaching, and how knowledge of such practice is developed from an evidential base" (Loughran, 2009, p. 199). Therefore, teacher educators have to be multi-faceted as they are expected to take on a number of seemingly conflicting roles, at least when acknowledging the available time and energy they have to divide between teaching, research, and administration (Smith, 2011). Despite the obvious complexity of teacher educator practice,

> Most teacher educators ... have never received education and training in methodologies of teaching, co-operation and learning appropriate for *adult learners* (student teachers and professional teachers). A number of problems of teacher education could arise from the fact that the whole issue of education of teacher educators has been rather neglected. (Bucherberger, Campos, Kallos, & Stephenson, 2000, p. 56)

While the quote above from the "Green Paper on Teacher Education in Europe" is almost two decades old, we continue to "*assume* that teacher educator learning and teacher educator preparation are similarly complex [as teaching and teacher learning] " (Knight et al., 2014, p. 268). Although national (Lunenberg, Dengerink, & Korthagen, 2014; Østern, 2016) and EU founded (Vanassche et al., 2015) initiatives provide valuable first attempts in addressing the education of teacher educators, there continues to be a lack of attention in this area (Bates, Swennen, & Jones, 2011; Murray, 2016; Smith, 2003).

In this doctoral thesis, I use the self-study of teacher education practices (S-STEP) methodology together with rhizomatics (Deleuze & Guattari, 1987) (a nonlinear philosophy that emphasizes relationships among a multitude of interacting components in a given social situation) to "provoke, challenge, and illuminate rather than confirm and settle" (Bullough & Pinnegar, 2001, p. 20) readers' thinking about teacher educator professional development. I used rhizomatic concepts to generate different thinking about the relational and constantly evolving process of my practice as I engaged with the S-STEP methodology as a pedagogy for my professional

development.

Specifically, this doctoral project examines a beginning physical education teacher educator's teaching and research practice as I aimed to develop my personal pedagogical skills and knowledge for teaching pre-service teachers and become research active. This examination involved two interrelated layers. One layer was composed of four physical education teacher education courses (two content courses and two school placements) divided into five phases. Data were generated over a 17-month period and included video and audio of my teaching, my reflective diary, pre-service teacher focus groups, pre-service teacher in-depth interviews, and pre-service teacher coursework. The other layer focused on the actual research process. Data were generated over the four-year doctoral period and included audio data from meetings with my supervisors. Taken together, the aim of this doctoral thesis is to add to research on processes of teacher educator professional development.

Importantly, my four-year educational doctoral journey has influenced the main constructs of this thesis. Observant readers will, from the list of studies alluded to above, notice that Sport Education (a student-centered approach to teaching) together with physical education teacher education functioned as two prominent constructs in the beginning of this doctoral project. However, through multiple connections and interactions, I began to pursue other goals for my doctoral project and this thesis. Subsequently, professional development, the complex nature of teacher education, and rhizomatics became prominent constructs in this thesis.

Plugging the self and the reader into the thesis

Currently I consider teacher (educator) professional development and practice as complex and relational. However, this has not always been the case. As a school teacher and team handball coach, I practiced a rather teacher-centered approach. Teaching in an urban upper-secondary school in a relatively high socioeconomic neighborhood, I experienced few difficulties and felt confident that teaching content knowledge at university would serve as nothing more challenging than in schools. Entering the doctoral program, I therefore had a rather linear view of teaching, teacher learning and teacher education. That is, the teacher educator is a teller that transfers or fills pre-service teachers with content knowledge and the golden standard of teaching. When becoming school teachers, pre-service teachers further transfer this content knowledge to school students. The transfer ends when school students exhibit knowledge on a test or in the end of a period.

Developing this doctoral project and reading the literature on teacher education, I started to acknowledge the need for student-centered approaches to teaching and teacher education, while starting to appreciate the need to teach pre-service teachers about the nature of teaching. However, while understanding more about the nature of teacher educator practice, I still had a rather simplistic view of teacher education. Consequently, the challenges I encountered when teaching pre-service teachers overwhelmed me.

While the first phase of my S-STEP research made me appreciate the complexity of teacher education, I lacked the language to explicate and understand the ambiguity, tensions and resistance I experienced in my practice. Hence, the work of Deleuze and Guattari functioned as a catalyst for my thinking and conceptualization of teacher educator practice and professional development. That is, I consider it as a complex, nonlinear process that is continuously changing as a result of the interaction between a multitude of elements and forces, such as the teacher educator (e.g., my history, education, previous experiences, personal characteristics), the environment (e.g., the classroom and pre-service teachers, the university, colleagues and particular collaborators, the teacher education community), and the practice of teacher education itself (e.g., curriculum, pedagogy, and research).

As you perhaps already have noticed, the headlines of this doctoral thesis are not consistent with common guidelines for writing up the summary of an article-based doctoral thesis. So, why have I deliberately chosen alternative headings for this doctoral thesis?

Rhizomatics resists the positivist linear and binary logic that “endlessly develops the law of the One that becomes two, then of the two that becomes four” (Deleuze & Guattari, 1987, p. 5). Instead, we are urged to think of multiples, flux, differences, and view the world as open-ended with no determined starting or ending point (Deleuze & Guattari, 1987). This made Strom and Martin (2017) question whether Deleuze and Guattari’s thinking are compatible with any articulated qualitative research protocol.

For a qualitative doctoral project, this involves following a set of steps in order to construct valid knowledge. The candidate should start reading the available research literature, then develop research questions and a procedure for data collection, follow interpretive guidelines, and finally share the findings through multiple articles and the final summary. Yet, despite Deleuze and Guattari’s resistance, Strom and Martin (2017) admit that we do exist in a stratified academic system over-coded by rules, “To produce a book [or a doctoral thesis], one must be able to impose

order, to organize thoughts and information in particular, conventional ways, to generate a text composed of linear sentences stacked on top of another" (p. 26).

Subsequently, thinking with Deleuze and Guattari's concepts in this thesis, I acknowledge both readers and the Committee for Postgraduate Education's (KFU) Standard regulations for the doctoral degree. KFU's guideline states that, "as a general rule", the doctoral summary should contain the following components: introduction, theoretical framework, methodology, a brief summary of each article with an explanation of the choice of research questions, a general discussion and conclusion, and a bibliography.

Consequently, in this summery of my article based doctoral thesis, I meet these components. However, I do not provide headings that allow for an easy linear path of reading. I hope this different heading ambition allow readers to appreciate the nonlinear nature of carrying out a doctoral thesis. Most importantly, I strongly encourage readers to avoid a linear trail through this thesis. My aim is not to show that I have followed a qualitative protocol to find *the* answer to the practice and professional development of teacher educators. I invite you to engage with the rhizomatic concepts and alternate your reading of the multiple sections, figures, articles, and appendix materials (e.g., rhizomatic maps). Think of yourself forming an assemblage with this doctoral thesis, that is, " 'come into composition' and 'plug' yourself into it, to create a machine (Deleuze & Guattari, 1987). Take out of it ideas that you can think with productively, and overall, *differently*, in your own context(s)" (Strom & Martin, 2017, p. xiii).

CHAPTER 1: THE COMPLEXITY IN DEVELOPING AS A TEACHER EDUCATOR

Professional development of teacher educators is deemed important for both teacher education and the educational system as a whole (Smith, 2003), emerging as a hallmark for what it means to become (i.e., transfer from school teacher to teacher educator) and learn as a teacher educator (Bates et al., 2011; Loughran, 2014). Given that there appears to be a general agreement that developing professionally as a teacher educator is complex (Knight et al., 2014; Korthagen, 2016; Loughran & Hamilton, 2016), it is remarkable that their learning and practice is under-studied and under-supported (Korthagen, 2016; Murray & Male, 2005). Subsequently, although research on teacher educators has grown in the last ten years, teacher educators remain a poorly understood and ill-defined occupational group (Murray, 2014, 2016) with no codified knowledge base for beginning teacher educators or set curricula for their induction (Cochran-Smith, 2003; Murray, 2016).

Studies of teacher educators' induction learning needs emphasizes the importance of developing a personal pedagogy and knowledge for teaching teachers and becoming research active (Murray, 2016). However, despite teacher educators' strong desire for professional development programs (Czerniawski, Guberman, & MacPhail, 2017) and positive results from such educational programs (Hadar & Brody, 2010), there is an absence of educational opportunities that specifically help teacher educators develop professionally (Goodwin et al., 2014). Teacher educators are therefore forced to seek professional learning opportunities alone or collectively (Gallagher, Griffin, Parker, Kitchen, & Figg, 2011), most frequently taking professional development into their own hands (Bates et al., 2011). Teacher educators researching their own practice for their professional development report experiences of ambiguity (e.g., Ritter, 2011) and tensions (e.g., Berry, 2007) in their personal efforts to develop an effective pedagogy of teacher education.

Loughran (2014) presented a framework (see figure 1) that sought to capture the research journey that shapes a teacher educator's professional development. His framework draws attention to the multi-faceted nature of teacher educators' practice and offers insights into the ways in which teacher educators' professional development might be better understood and interpreted. The framework attends to crucial shaping components in teacher educator professional development: (i) the transition associated with becoming a teacher educator, (ii) the nature of teacher education

itself, and (iii) the importance of researching teacher education practices (Loughran, 2014).

Below, I begin elaborating on each of the three shaping components of teacher educator professional development before specifying the doctoral thesis aim, purpose, and research question.

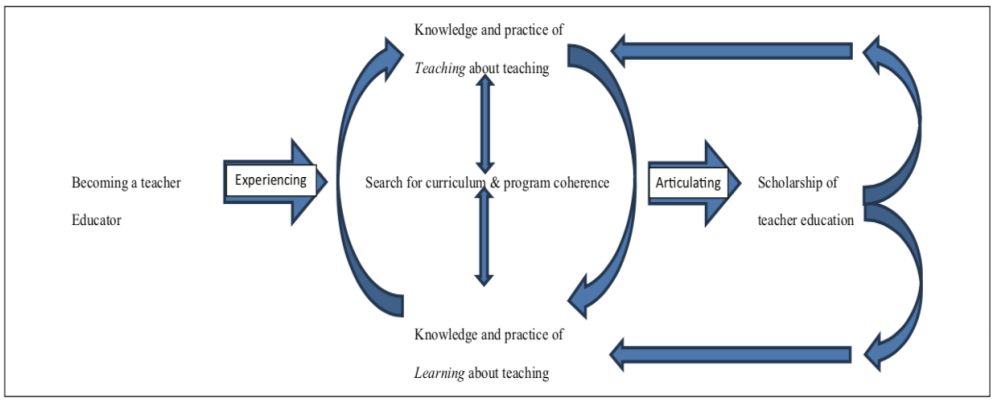

Figure 1. A research journey that shapes a teacher educator's professional development (retrieved from Loughran, 2014, p. 2).

Becoming a teacher educator

There is a common assumption that effective teachers naturally become effective teacher educators (Korthagen, Loughran, & Lunenberg, 2005). However, research indicates that the transition from classroom teacher to teacher educator is not necessarily a seamless transition (e.g., Casey & Fletcher, 2012; Ritter, 2007), but rather characterized by high levels of uncertainty and anxiety (Murray & Male, 2005). Confronted with several different and complex tasks (Williams, Ritter, & Bullock, 2012), beginning teacher educators experience challenges, "identity shock" (Davey, 2013) and subsequent identity changes, and distinct shifts in knowledge and pedagogies (Murray, 2016). Thus, teacher educators' identity negotiations and construction of professionalism are both complex (Murray, 2014) and constructed over time, rather than being linked solely to the new role as teacher educator (Goodwin & Kosnik, 2013).

While the above research acknowledges that becoming and learning as a teacher educator involves a continuous process, other researchers (e.g., Davis & Sumara, 1997; Grossman & McDonald, 2008; Ludlow et al., 2017) argue for a multi-perspective view that more fully accounts

for teacher education's interconnecting contexts and processes. Rather than considering teacher (educator) identity as a fixed phenomenon or a linear process, in such a view becoming a teacher educator is as an ongoing, dynamic, constantly evolving process, shaped both by the teacher educator and the settings in which the teacher educator is implicated (e.g., Beijaard, Meijer, & Verloop, 2004; Ovens, Garbett, & Hutchinson, 2016; Ovens, Strom, & Garbett, 2016; Strom & Martin, 2017).

The nature of teacher educator practice

In this thesis, I define practice as all the activities in which someone engages as part of a particular profession (Pinnegar & Hamilton, 2009). Subsequently, teacher educator practice does not only involve teaching teachers. It also involves teacher educators fulfilling roles such as curriculum developer (Grossman, Hammerness, & McDonald, 2009), researcher (Lunenberg et al., 2014) and gatekeeper (Smith, 2007) within which their associated practices emerge in a complex interplay between curriculum, pedagogy, and research (Gallagher et al., 2011; Loughran, 2014).

Below, I begin with a consideration of teacher educators' different approaches to curriculum. Then, I provide a consideration of the pedagogy of teacher education. Thirdly, I consider the teacher educator as researcher with a particular focus on S-STEP research. Given that this thesis centers around the teacher educator's teaching and research practice, it is anticipated that this section will be appreciated by readers in providing context to the associated constructs.

Curriculum

Korthagen, Kessels, Koster, Lagerwerf, and Wubbels (2001) distinguished between a "traditional" teacher education program and that of a "realistic" teacher education program. Central to the differentiation between the two is the way the program structure shapes the curriculum, and in so doing, influences the ways in which teaching and learning is interpreted and carried out in practice (Loughran, 2014). In a traditional program, teacher educators tend to be concerned with their subject of expertise or area of teaching and are assigned typically described courses (e.g., foundation subjects or method subjects). In a realistic program, the curriculum is designed to create coherence where action and intent of teaching and learning is both closely aligned (e.g., Bullough, Young, & Draper, 2004), and tailored around the needs and concerns of pre-service teachers (Korthagen et al., 2001).

My understanding is that realistic teacher education programs are often closely aligned with

what has been called the “practical turn” (Reid, 2011) in teacher education. Grudnoff et al. (2017) argued that there are many different meanings of the term “practice” or a “practice-based” teacher education that reflect different views of teaching and learning. One approach to teacher education is driven by a technical view, which assumes that the teacher education curriculum should focus on teaching pre-service teachers management techniques that is understood as explicit, uniform, predictable sequences of teacher behaviors (e.g., Lemov, 2010). Another approach to teacher education is to center the curriculum on teaching key practices to pre-service teachers (e.g., Grossman et al., 2009). In this view, while the key practices are considered complicated, they are predictable and stable across contexts. In contrast, a complex approach to teacher education grounds the curriculum in a belief that teaching is non-linear, holistic, and not a fully predictable activity that is more than the sum of its parts (Opfer & Pedder, 2011).

Pedagogy

A pedagogy of teacher education is defined as the theory and practice of teaching about teaching and learning about teaching (Loughran, 2006). While a pedagogy of teacher education is in its infancy as an academic area (Korthagen, 2016), researchers (e.g., Darling-Hammond, 2006; Korthagen, 2016; Zeichner, 2005) who advocate for a pedagogy of teacher education argue that it involves a knowledge of “teaching about teaching and a knowledge of learning about teaching and how the two influence one another in the pedagogical episodes that teacher educators create to offer students of teaching experiences that might inform their developing views of practice” (Loughran, 2008, p. 1180).

Teaching about teaching in ways that strongly influence pre-service teachers’ learning comprises (at least): (a) a serious focus on pedagogy, (b) conceptualizing teaching as being problematic, (c) making the tacit nature of practice explicit, (d) developing a shared language of teaching and learning, and (e) the ability to articulate principles of practice (Loughran, 2006, 2014). According to Loughran (2014), learning about teaching needs to be acknowledged as it constitutes the second aspect of the interrelated relationship between teaching and learning that is the core of a pedagogy of teacher education. Learning about teaching is “concerned with the knowledge and practices related to the ways in which students of teaching [i.e., pre-service teachers] come to learn from, and then develop as a consequence of, their teacher education experiences” (Loughran, 2014, p. 5).

Given that pre-service teachers’ learning agenda includes learning about the specific

content being taught, learning about learning and learning about teaching, both teacher educators and pre-service teachers need to consciously operate on two levels (Loughran, 2006). The first level is concerned with the nature of the "content" being examined in the teaching and learning environment, while the second level is concerned with the nature of the teaching that is being employed. Loughran (2006) argued that considering only the "what" and "how" of teaching provides a narrow view of teaching and learning about teaching. He believed that teacher educators need to pay attention to the "why" of teaching, and additionally both know and be able to articulate the what, how, and why of teaching through the very experience of teaching and learning (Loughran, 2006). In this way teacher educators move away from transmitting a "recipe" of teaching through the "showing, telling, guided practice" (Myers, 2002) that still underpins some teacher educators' practices.

Self-study of teacher education practices research

The birth of S-STEP in the early 1990s has been labeled as "the single most significant development ever in the field of teacher education research" (Zeichner, 1999, p. 8). It refers to a network of teacher educators who hold an inquiry-oriented stance towards researching one's own practice, reflecting their "desire to be *more*, to *improve*, to *better understand*" (Ovens & Fletcher, 2014, p. 7). S-STEP researchers systematically investigate their practices in order to improve them, based on a deepened understanding of these practices, as well as the contexts in which these practices evolve. By making their understanding public, S-STEP researchers simultaneously aim at contributing to a shared knowledge-base of teacher education.

S-STEP is a methodology that allows teacher educators to purposefully examine the relationships in their practice (Loughran, 2006). While there are examples of S-STEP researchers (e.g., Berry, 2007; Ní Chróinín, Fletcher, & O'Sullivan, 2017) that consider the obvious complexity of teaching and learning in teacher education (Loughran, 2006), I argue that it continues to be a need for S-STEP research that examines in detail the interrelated relationship of teacher educator practice.

Hamilton and Pinnegar (2014) present S-STEP as a research methodology that can be used pedagogically to explore the practice of teacher educators and, as such, function as a pedagogy of professional development. They argued that S-STEP has several characteristics that position it as a form of professional development. These include its focus on, and reflection on, self in relation to others in practice; its focus on ontology; and its use of dialogue as a process of understanding

(Pinnegar & Hamilton, 2009). Engaging with such characteristics, S-STEP research can support the individual professional development of teacher educators as well as contribute to the research conversation in teacher education (Hamilton & Pinnegar, 2014).

Aim, purpose, and research question

Researchers advocate for an "ontological turn" (Lather & St. Pierre, 2013) in teacher education research (Strom, 2015; Strom & Martin, 2017), encouraging a focus on the relational process(es) of teacher educator professional development and practice rather than the outcomes alone. Specifically, rich qualitative research that uses non-linear frameworks (such as rhizomatics (Deleuze & Guattari, 1987), cultural-historical activity theory (Engeström, 1999) and actor-network theory (Latour, 2005)) to investigate interactions between human actors, and the ways that multiple human and non-human elements shape practice, is deemed valuable (Strom, 2015; Strom & Martin, 2017).

This doctoral thesis was prompted by the desire to generate understanding and thinking differently and in more non-linear interactive ways about teacher educator professional development. Marring the nature of rhizomatics (Deleuze & Guattari, 1987) and S-STEP methodology (Pinnegar & Hamilton, 2009), I focus on practicality, process, and context. Executing a rich qualitative doctoral project, I examined the relational, interactive and constantly evolving processes of my practice as I engaged with the S-STEP methodology as a pedagogy for my professional development.

As such, this doctoral thesis aims to add to research on processes of teacher educator professional development. I aim to contribute to the establishment of a robust, research-based knowledge base for teacher educators with specific focus on beginning teacher educators. Particularly, the purpose of this thesis is to investigate my teacher education teaching and research practice. That is, I consider the processes of a beginning teacher educator's practices, experiences, contexts and knowledge construction. The following research question evolved from the research process:

"How does a teacher educator negotiate his teaching and research practice as he develops professionally?"

CHAPTER 2: THINKING WITH RHIZOMATICS

Rhizomatics (Deleuze & Guattari, 1987) provides a helpful tool for explaining the complexities of enacting change at the micro-level of the teacher (educator) and classroom (Strom, 2015; Strom & Martin, 2017). It is an extension of the work by Gilles Deleuze (a philosopher) and Félix Guattari (a psychoanalyst), who use the concept of a rhizome to express a non-linear, multiplistic, relational way of thinking, of ontology, and of human experience (Deleuze & Guattari, 1987).

Rhizomatics seeks to advance an alternative (rather than an opposite) thought to the positivist view that underpins Western society. In short, positivist thinking emphasizes that there is an objective reality that may be studied and ordered according to a universal set of rules, that knowledge exists "out there" to be discovered, and that humans are rational creatures whose existence is defined by their very rationality (for details, see St. Pierre, 2000). Deleuze and Guattari (1987) referred to this Western positivist thought as the "tree logic" which they considered as rigid, stable, hierarchical and affirms linear thinking. To propose an alternative thought, they contrasted a rhizome with a tree, "A rhizome has no beginning or end; it is always in the middle, between things... The tree is filiation, but the rhizome is alliance, uniquely alliance. The tree imposes the verb 'to be,' but the fabric of the rhizome is the conjunction, 'and . . . and . . . and . . .' " (p. 26).

The rhizome can be considered both philosophically and scientifically (Strom, 2014). Philosophically, the rhizome is a figuration of knowledge that serves as a "multiplistic" alternative to the traditional branched and linear Western mode of thought. Scientifically, a rhizome is a crabgrass or ginger (rather than a tree) that consists of a network of connections that grows unpredictably in all directions, constantly evolving. Several characteristics of the rhizome merit attention. Any point of rhizomes are connected by lines to another heterogenic point. Rhizomes are comprised of networks of "multiplicities" that grow in all directions. Ruptures may occur within the rhizome, but new lines will always be generated. Rhizomes are considered maps rather than tracings, meaning that their always open and can be entered at any point, constantly changing its structure (Deleuze & Guattari, 1987).

Deleuze and Guattari (1987) offer multiple concepts that can each be "plugged in" to unsettle and provoke alternative non-linear ways of thinking. While I acknowledge the difficulty of considering one rhizomatic concept without considering others (St. Pierre, 2016), for the purpose of this doctoral thesis I plug in the concept of "assemblage". Further, to help readers follow and

understand my thinking, I engage with two interrelated schematic cues (Jackson & Mazzei, 2012), i.e., “becoming” and “lines of flight”.

Assemblage

An assemblage is an “aggregate of elements, both human and non-human, that function collectively in a contextual unique manner to produce something (e.g., teaching practice, a situated identity)” (Strom & Martin, 2017, p. 7). Thus, assemblage is both a mixture of heterogenic elements but also the process where the mixture of elements interact to produce teaching, learning, research or understanding. A university classroom is an assemblage, composed of teacher educators (their knowledge, experiences, and beliefs), the pre-service teachers (their knowledge, experiences, beliefs, and investments), the physical space (journal articles, books, equipment, the room environment), and discourses (the teacher educator’s expectations about the pre-service teachers and vice versa) (De Freitas, 2012). The ways the various components of the university classroom (the teacher educator, the pre-service teachers, the physical space, the discourses, and so on) combine and interact collectively shape teaching practices. Rather than viewing each component as discrete variables that are independent of one another, teaching, learning, research and understanding becomes a collective enterprise co-produced through the particular conflux of elements and the way they iteratively work together (Strom & Martin, 2017).

The concept of assemblage allows me to consider: (i) relationships and interactions in my practice, (ii) the pre-service teachers and myself as only two connected elements contributing to teacher educator practice, and (iii) myself as only one of a multitude of components co-producing understanding about practice.

Becoming

Deleuze and Guattari’s (1987) use of the concept “becoming” is somewhat different from the mainstream use of becoming a teacher educator (e.g., Murray & Male, 2005; Williams et al., 2012; Zeichner, 2005). As alluded to previously, the notion of becoming a teacher educator is usually regarded as a continuous linear process. However, Deleuze and Guattari (1987) remind us that, “Becoming is certainly not imitating, or identifying with something... ; neither is it corresponding, … [or] producing … Becoming is a verb with a consistency all its own; it does not reduce to, or lead back to, ... ‘being’ ” (p. 279). Subsequently, Deleuze and Guattari’s (1987) use of becoming is situated in a permanent middle, i.e., not as a process of directional development necessarily

where you approach an end point (e.g., from school teacher to teacher educator), but rather becoming-other, becoming-different.

Becoming, then, expresses a happening rather than a fixed phenomenon (Strom & Martin, 2017) and concerns qualitatively different emergences that occur to, and within, a multiplicity (e.g., the teacher educator), produced by the collective workings of the assemblage (Semetsky, 2006). To contextualize to this study, becoming a teacher educator necessarily implicates not just the individual teacher, but a creation that is co-constructed by the elements, forces, bodies, and ideas that make up the classroom-assemblage.

The concept of becoming allows me to consider teaching practice not as a static phenomenon but rather as co-constructed becomings, or transformations-in-action, produced by the collective workings of the classroom-assemblage. Further, the concept allows me to consider identity as dynamic in nature.

Lines of flight

"Lines of flight" represents brakes from the status quo. Deleuze and Guattari (1987) urge us to follow the connections and experiment with them, as it is the lines of flight that allow us to create something new. However, Albrecht-Crane and Slack (2003) argue that lines of flight always are "recaptured by the norm, but on re-entry to the normalized system, they shuffle regulatory mechanisms, creating mutations and opening the possibility of larger changes in the system" (as cited in Ovens, Strom, et al., 2016, p. 182). To contextualize to this doctoral thesis, lines of flight represent moments where the teacher educator and pre-service teachers break from their roles as teacher and learner, temporarily escaping traditional educational norms.

The concept of lines of flight allows me to consider moments in my teaching and research practice that functioned as a break from the status quo. That is, particular becomings that opened possibilities of change in my practice or thinking about practice.

Elements influencing teacher educator practice

For Deleuze and Guattari (1987) everything is a multiplicity, that is, a collective of elements. A multiplicity should be considered in its substantive form, as a multiplicity of something (Parr, 2005). On a closer examination of the literature, I read that teacher educators must navigate multiple, simultaneous elements in their setting. That is, in the particular assemblages in which they are embedded. Subsequently, the teacher educator is a multiplicity (composed of his/her own

beliefs, backgrounds, experiences, languages, cultures, and investments) within multiplicities (the classroom, the university, the social and political), and the way the particular multiplicities come together shapes the teaching and research practice that is enacted and the type of understanding that is constructed.

The teacher educator multiplicity

The teacher educator brings multiple aspects that shape their practice, including their beliefs and values (Russell, 2007), biography (Graber & Schempp, 2000), occupational socialization (Cutforth, 2013; Lee & Curtner-Smith, 2011), knowledge and understanding (Superfine & Li, 2014), personal practical knowledge (Ross & Chan, 2016), perspectives (Lavay, Henderson, French, & Guthrie, 2012), and perceptions and expectations (Graber, 1990). For example, a study of Norwegian physical education teacher educators reported that their professional knowledge was based in knowing the content and how to deliver it, viewing their primary function to transmit the "truths" of teaching to pre-service teachers (Dowling, 2006).

The classroom multiplicity

Pre-service teachers influence teacher educators' practice and Loughran (2014) argued that "the concerns, issues, and expectations of student teachers [i.e., pre-service teachers] exist and must be acknowledged and responded to in real ways through teacher education" (p. 5). Pre-service teachers bring with them their backgrounds, occupational socialization, beliefs, and expectations to the classroom. While it is possible for teacher education to change pre-service teachers' strong beliefs about teaching and learning (Sosu & Gray, 2012), teacher educators' practice is influenced by their perceptions of pre-service teachers' interest in a given course (Graber, 1990).

For example, researchers have suggested that Norwegian pre-service teachers appear to view the primary function of physical education teacher education to develop their sport skills and teaching techniques (Mordal-Moen & Green, 2014b). In the intersection between the classroom and university, Berry (2007) identified multiple tensions in her teacher education practice that occurred in the interplay between matching the objectives of the teacher education program with the needs and concerns that pre-service teachers expressed for their own learning.

The university multiplicity

The powerful influence of the professional context is documented in the literature. Teacher educators' practice is influenced by the program structure (Loughran, 2014), institutional expectations (Cutforth, 2013), faculty colleagues (MacPhail, 2014), and multiple stakeholders (Goodwin et al., 2014). For example, in a study of Norwegian physical education teacher educators, a combination of local and national contexts served to encourage the teacher educators to reproduce the typically conservative ideologies and practices that they were already habitually predisposed towards (Mordal-Moen & Green, 2014a).

The social and political multiplicities

The powerful influence of the broader social, political and educational contexts within which teacher educators work is well documented in the literature (e.g., Ní Chróinín, O'Sullivan, & Tormey, 2013; Goodwin et al., 2014; Swennen, Shagrir, & Cooper, 2009). For example, Grossman and McDonald (2008) discussed contextual influences on teacher educators' practice. First, through standards for accreditation and requirements for licensure, governments dictate the contours of teacher education programs. Second, the vast majority of teacher education programs are situated within institutions of higher education and operate within an institutional context that constrains the practice of teacher educators. Finally, teacher education programs are situated in local contexts and labor markets and consequently supply and demand issues often determine what is, and is not, possible for teacher educators.

From a rhizomatic lens, the different multiplicities do not work in isolation but rather simultaneously to influence the construction of practice and understanding. As such, it is the way the teacher educator multiplicity combines and interacts with the other multiplicities (together creating the assemblage in total) that determines the type of practice enacted and understanding that is being constructed, while appreciating that one or more elements might exert more influence than others might.

CHAPTER 3: RHIZOMATIC INQUIRY

I begin this chapter by recognizing that not all studies of this doctoral thesis are grounded in rhizomatics and post-structural thoughts. I began my doctoral research with an (unconscious) intention to analyze and report my data in a rather linear manner. However, I found myself straddling Ellingson's (2009) articulated "middle" stance on the continuum of qualitative research (with rather positivist, objective research on one end and creative/performative at the other). This means that some conventions of traditional qualitative research (such as coding, categorizing, and pattern making) is retained to an extent in my doctoral project. However, I hope readers appreciate the non-linear educational nature of conducting a doctoral project and finds my rhizomatic post-positioning as a worthwhile site for producing different thinking about teacher education and particularly teacher educator practice and professional development.

According to Strom and Martin (2017), a rhizomatic view of life raises additional issues for most qualitative research. They suggest that instead of analyzing the participant(s) as individual subjects, researchers are encouraged to analyze relationships among multiplicities and assemblages. Thus, in this doctoral thesis, I focused on the interactions between myself and other elements of the assemblages in which I was embedded. The notion of assemblage acknowledges the researcher not as separated from the practice or participants but as a multiplicity that works together with the other participants and data multiplicities in particular ways to produce particular analysis that represents *a* reality (Strom & Martin, 2017). In addition, while each multiplicity collectively contributes to the assemblage production, their contribution cannot be isolated or analyzed. Thus, I acknowledge my position as researcher and researched in this thesis, while focusing on understanding the whole (not pieces) of my practice (Cochran-Smith, Ell, Ludlow, Grudnoff, & Aitken, 2014).

I have divided this chapter into seven sub-sections. First, I connect this doctoral thesis to post qualitative-research and crystallization. Second, I situate and define my S-STEP research. Third, I provide a general description of the induction of teacher educators in Norway before describing the specific setting of my project. Fourth, I elaborate on my learning stance and the pedagogical approach I used in my teaching practice. Fifth, I briefly describe the particular teaching and research practices of my doctoral project, including the human actors involved with the project.

Sixth, I explain the data generation and consider the analysis. Finally, I consider trustworthiness and ethics of my doctoral project.

Plugging in post-qualitative research and crystallization

Following researchers who recognize that qualitative (Jackson & Mazzei, 2012) and educational (Strom & Martin, 2017) research is often underpinned by positivist notions like objectivity and universality, this doctoral thesis is grounded in a post-qualitative paradigm (Lather & St. Pierre, 2013). Post-qualitative researchers doubt that any one method is "right" or one body of knowledge is "true", yet do not reject more traditional qualitative methods (Ellingson, 2009). Expressing a break from traditional qualitative research, post-qualitative research aims to "open up" rigid notions of traditional research methodology (St. Pierre, 2011). This perspective insists that all knowing is partial and research is inherently value and perspective-based (St. Pierre, 2000). As such, post-qualitative research is consistent with rhizomatics (Deleuze & Guattari, 1987) and S-STEP research (Hamilton & Pinnegar, 2015), both aiming to disrupt and break from traditional methodologies, while viewing knowledge as partial and constructed.

St. Pierre (2011) cautions that post-qualitative research does not offer "a recipe, an outline, a structure...another handy 'research design' in which one can safely secure oneself and one's work" (p. 613). With this in mind, I turned to crystallization (Ellingson, 2009) to provide guiding insights for this thesis, forging "a nomadic methodological path" (Strom & Martin, 2017, p. 28) in my effort to generate understanding from the five studies contributing to this thesis. Ellingson (2009) defined crystallization as a methodological framework that,

> combines multiple forms of analysis and multiple genres of representation into a coherent text or series of related texts, building a rich and openly partial account of a phenomenon that problematizes its own construction, highlights researchers' vulnerabilities and positionality, makes claims about socially constructed meanings, and reveals the indeterminacy of knowledge claims even as it makes them. (Ellingson, 2009, p. 4).

As a qualitative research methodology, crystallization pushes beyond traditional qualitative research boundaries by mixing realist, social constructionist and artistic research genres. Ellingson (2009) further outlines the general criteria for crystalized qualitative research projects, which she suggests: (i) include richly described, complex renderings and interpretations of phenomena; (ii) utilize multiple, contrasting methods of knowledge production among genres of qualitative

research, including both constructivist and creative approaches; (iii) offer multiple modes of textual and visual expression; (iv) contain extensive interrogation of the role of the researcher; and (v) regard knowledge as "situated, partial, constructed, multiple, embodied, and enmeshed in power relations" (p. 10).

As such, crystallization worked as a productive methodological guide to marry the different studies in this doctoral thesis. It helped me connect heterogeneous pieces of theory, methods, analytic tools, and findings to one another. As such, I created a doctoral thesis-assemblage that included myself, my two supervisors, my critical friend, crystallization, rhizomatics, S-STEP, and the five doctoral studies (composed of different theories, heterogenic data, conventional and postmodern analytic methods, and various findings).

Assembling and unfolding a self-study of teacher education practices

While crystallization functions as the overall methodological guide for this doctoral thesis, I engaged with the S-STEP methodology to examine my practice (Ovens & Fletcher, 2014; Pinnegar & Hamilton, 2009). S-STEP is conceptualized as a methodology centered on the role of the teacher educator within professional practice settings (Ovens & Fletcher, 2014). It is situated within the realm of intimate scholarship (Hamilton & Pinnegar, 2015) as it aims to allow teacher educators to better understand (and consequently improve) their practice through careful examination of the interplay between one's own learning beliefs, practices, processes, contexts, and relationships (Ovens & Fletcher, 2014; Pinnegar & Hamilton, 2009). Subsequently, S-STEP served as a purposefully methodology to examining relationships within my teacher education practices.

In undertaking the S-STEP research I have sought to deliberately align my work with LaBoskey's (2004) five characteristics of self-study research. As such, methodologically defined, my S-STEP design:

> (a) was self-initiated and self-focused. I had a desire to investigate the processes of my practice and professional development as a teacher educator.
>
> (b) was improvement-aimed. I intended to better understand my teacher educator practices, while further implicating the ways this personal understanding could be useful for others.

(c) was interactive in terms of the process. I engaged in a process of dialogue with my research team that included my two supervisors (Lars Tore and Ann) and a critical friend (Deborah) throughout this doctoral project, while engaging in an interacting relationship with pre-service teachers in my teaching practice and in data generation. Furthermore, I acknowledge other human and non-human elements that I connected to and interacted with throughout my doctoral project.

(d) employed multiple qualitative methods. As described later in the chapter, this included video and audio recording of my teaching, my reflective diary, pre-service teacher focus groups, pre-service teacher in-depth interviews, team and individual pre-service teacher coursework, and audio from my meetings with Lars Tore, Ann, and Deborah.

(e) involved validation process based on trustworthiness. This involved sharing details of the research process to enhance trustworthiness of the findings, while relying on others in the teacher education community to determine whether the findings are trustworthy and meaningful for them. I further elaborate on the project trustworthiness and ethics at the end of this chapter.

Conducting a doctoral project in Norwegian physical education teacher education

Induction of teacher educators

As in other countries (Murray, 2016), there is no codified knowledge base for beginning teacher educators and no set curricula for their induction in Norway. At present, teacher educators can be recruited with or without a doctoral degree or experiences of teaching in either schools or higher education. However, a likely consequence of the recent policy changes leading to teacher education at Master's level (introduced in 2017) together with the continued requirements of conducting research, is that in the future all teacher educators entering higher education will be required to hold a doctoral degree (Elstad, 2010; Smith, 2011).

The doctoral degree is the highest level of education in Norway. To be eligible for admission to a doctoral program, you must have a relevant five-year Master's degree with an exceptional grade, or equivalent qualifications approved by the faculty/department. The doctoral candidate is either funded as a doctoral research fellowship or through external founding. As a

doctoral research fellow, the candidate is temporarily employed in an academic position in the affiliated faculty or center. The candidate is appointed for either three years without a mandatory teaching component or four years with a 25% mandatory teaching component. The doctoral candidate is also required to complete an educational component made up of compulsory activities and elective courses/seminars.

The specific project setting

I was appointed on a four-year contract at the Norwegian School of Sport Sciences (NSSS). NSSS is a fifty-year old scientific university with a national responsibility for research and education in the field of sport sciences. I resided within the Coaching and Psychology Department, one of five sport sciences fields at the NSSS. The mandatory 25% teaching component provided me the opportunity to carry out an S-STEP project. While I resided within the Coaching and Psychology Department, employees at the NSSS often teach undergraduates from other departments. Subsequently, this doctoral project was conducted within the doctoral program and the three-year undergraduate physical education teacher education program that resides within the Physical Education Department.

The three-year physical education teacher education undergraduate program serves approximately one hundred pre-service teachers. The National Curriculum Regulations for physical education teacher education (Utdannings- og forskningsdepartementet, 2013) lists explicitly the knowledge and competencies that new teachers have to achieve and document. This list is based in the following areas of competence: school in society; ethics; pedagogy and didactics; management of learning processes; collaboration and communication; change and development. The program contains theoretical and practical courses (a combination of compulsory and optional) and two six-week school placements, each divided into two periods of teaching within the same school.

Learning stance and pedagogical approach

In this thesis, and in my teaching, I adopt a social constructivist / sociocultural learning stance, meaning that knowledge is co-constructed through interaction with others in a particular setting (Dewey, 1938; Vygotsky, 1978). Subsequently, in my teaching practice I aimed to create learning experiences that required pre-service teacher participation, reflection, and interactions, while working to facilitate pre-service teachers to create their own understanding of teaching and learning

(Perkins, 1999). Recognizing the collaboratively created and multiple nature of knowledge and learning processes, a constructivist view of teaching and learning aligns with rhizomatic thought and being (Deleuze & Guattari, 1987; Strom & Martin, 2017).

While social constructivism is a productive learning theory, it is not a theory of teaching. Thus, I aimed to teach pre-service teachers about a pedagogical model of teaching physical education through the enactment of multiple pedagogical strategies and techniques for teacher education. A common thread for the pedagogical model and my pedagogical approach is that they are both research informed and align with a social constructive learning stance.

Below, I begin describing my pedagogical approach. Then, I discuss the rationale behind pedagogical models in physical education before describing the content of the pedagogical model I taught pre-service teachers about teaching.

Explicit modeling

Acknowledging the requirements of teaching about teaching and the need to pay attention to and articulate the what, how and why of teaching and learning (Loughran, 2006, 2014), I used "explicit modeling" as my overall strategy (Lunenberg, Korthagen, & Swennen, 2007). This involved modeling teaching of the pedagogical model, while aiming to make the pedagogical rationale behind my teaching explicit, and share the feelings, thoughts and actions accompanying my approach (Loughran & Berry, 2005). As a way to promote pre-service teacher reflection that could enable them to "analyze, discuss, evaluate and change their own practice" (Calderhead & Gates, 1993, p. 2), I used three additional advocated techniques for my explicit modeling: (i) thinking aloud, (ii) writing a reflective diary that I shared with the pre-service teachers (only in the second university course), and (iii) discussions at the end of lessons (Loughran & Berry, 2005). Further, pre-service teachers were required to develop portfolios that included a comprehensive plan for how to teach in school placement (developed in groups) and an individual portfolio (i.e., teaching philosophy, expectations of teaching, after class reflection and end of each period reflection). My pedagogical approach is described in more detailed in the five studies comprising this thesis, and specifically in study I, II, and III.

The Sport Education pedagogical model

Physical education in Norway is designated as a subject that contributes to general education and to broad movement competence (Utdanningsdirektoratet, 2012). However, it has been suggested

that in physical education there is a gap between curriculum objectives and actual teaching practice (Borgen & Engelsrud, 2015; Mordal-Moen, 2011). Sports and physical training continues to be emphasized in physical education (Säfvenbom, Haugen, & Bulie, 2015), and the idea of physical education as sport techniques has dominated the curriculum in Norway from middle of the 20th century until the present (Augestad, 2003). In a recent study, it was indicated that physical education is "rooted in ideas and practices derived from military, sports and exercise physiology discourse" (Aasland, Walseth, & Engelsrud, 2017, p. 490).

The above research mirrors findings from international studies which has made researchers (Kirk, 2010; Lawson, 2009; Tinning, 2009) encourage drastic reconceptualization of the subject. To avoid a cautioned extinction of the subject (Kirk, 2010), researchers have been arguing for a radical reform that centers physical education (teacher education) around pedagogical models and further a models-based approach to teaching practice (Casey, 2014; Fletcher & Casey, 2014; Kirk, 2013). Casey (2016) defined a pedagogical model as focusing on the interdependent and irreducible four-way relationship between learning, teaching, subject matter, and context (Rovegno, 2006). He further defines models-based practice as, "a mechanism or pedagogical approach through which to move away from privileging the subject matter (i.e., curriculum) or the teacher (i.e., instructional) of physical education and instead aligns outcomes with the students' needs and the teaching/instructional style" (Casey, 2016, p. 58).

Because of the scope of my teaching and limited use of models-based practice or any pedagogical model in Norway, I concentrated on teaching pre-service teachers about one pedagogical model. Sport Education is a pedagogical model that was developed amid concerns about the lack of authentic, legitimate and worthwhile opportunities for students to experience sport through physical education (Siedentop, 1994; Siedentop et al., 2011). It is based on socio constructivist learning theory where students are required to construct knowledge through social interaction with their peers (Dyson, Griffin, & Hastie, 2004). This means that students are involved in tasks that stimulate decision making, critical thinking, and problem-solving while being guided by the teacher (educator) to discover knowledge and to create their own understanding of the subject matter.

Sport Education aims to educate students in the fullest sense, focusing on the long term learning objectives of developing students as competent, literate, and enthusiastic sportspersons (Siedentop, 1994). The subject matter is not a range of different sports but sport itself, in which

Siedentop (1994) identified the key characteristics as seasons, affiliation, formal competition, record keeping, culminating event and festivity. Students are held accountable by remaining in the same team throughout the season while experiencing a number of roles (e.g., coach, referee, journalist) in addition to that of a player.

The teaching and research practices

Human actors

Mats. I was 26- year's old when I enrolled as a full-time doctoral candidate on a four-year fully founded doctoral program at the Norwegian School of Sport Sciences (NSSS). From a middle class, countryside background, I was active in sports and started to coach team handball at the age of fifteen. I had undertaken my entire higher education at the NSSS, mainly within the field of coaching and psychology (Bachelor and Master's), with a one-year pedagogy supplementary degree that qualified me as a teacher. I worked as a secondary school physical education teacher for over two years before embarking on the Doctoral position at the NSSS.

Pre-service teachers. Twenty-seven pre-service teachers, aged between 19 and 29 years, were in their second and third year of a three-year physical education teacher education program. While the age difference was relatively wide-ranging, sixteen of the pre-service teachers graduated from high school one or two years prior to entering the physical education teacher education program. While growing up in different parts of Norway, the pre-service teachers had similar physical education and sports backgrounds and experiences. They reported positive experiences from physical education, sharing that in physical education they were skilled and received high grades.

Supervisory team. My supervisory team included Lars Tore and Ann, two formally appointed supervisors, and Deborah, who functioned as a critical friend. Lars Tore was responsible for the doctoral advertisement and served as main supervisor. His area of expertise is coaching, coach education, and sociology. He was located at the NSSS where he functioned as Deputy Rector. Ann served as the co-supervisor and was located at the University of Limerick in Ireland where she functioned as Chair of the Department of Physical Education and Sport Sciences. Her areas of expertise are physical education teacher education, S-STEP, curriculum development, assessment, and pedagogical models. Deborah resided within the same department as Ann and completed the supervisory team as my 'critical friend' (Fletcher, Ní Chróinín, & O'Sullivan, 2016). Her areas of

expertise are physical education teacher education, instructional alignment, communities of practice, and pedagogical models (see study I, III and V for detailed consideration of the critical friendship).

The research process

The scope of this doctoral thesis does not allow me to provide the required details, descriptions, and accounts of my practice that is deemed important in S-STEP (Pinnegar & Hamilton, 2009). However, each of the five studies allows readers insight into the detailed nature of both the teaching and learning experiences, and the research process. Below, I give an overview of my research process before describing the scope of the teaching and learning experiences.

Given that I aimed to examine the dual teacher educator commitments of teaching and researching, the research process involved two interrelated layers. One layer focused on my S-STEP research process that involved meetings with Lars Tore, Ann, and Deborah conducted throughout the four-year doctoral period. The other layer focused on my teaching practice and was composed of four physical education teacher education courses (two content courses and two school placements) divided into five phases. Figure 2 and Figure 3, in addition to study V, provide details on my research journey and associated empirical work throughout the research process.

The teaching and learning experiences

The particular teaching and learning experiences comprising my S-STEP research included four physical education teacher education courses (two content courses and two school placements) divided into five phases (see Table 1 and Figure 3). The program description for both university courses stated broad course goals such as developing pedagogical and didactic skills, assessment skills, knowledge and understanding of the activities basic skills and tactics, discussing the activities culturally and ethically, and contributing to creativity and innovative processes. From these broad course goals, I developed specific objectives that focused on learning how to teach games through the Sport Education pedagogical model. The main goal for school placement is that pre-service teachers meet the claims and challenges that one expects a teacher to experience in everyday life.

The five phases encompassed:

(i) *University course.* A self-selected five-credit practical based course in team handball carried out in the pre-service teachers' third semester of the physical

education teacher education program. Twelve pre-service teachers selected the course that consisted of ten 90-minute lessons.

(ii) *School placement.* A four-week school placement in primary school carried out in the pre-service teachers' forth semester of the program, and five weeks after completion of the team handball course. Four of the pre-service teachers that participated in the previous university course taught using the Sport Education model.

(iii) *University course.* The first period of a self-selected seven-credit practical based course, named "Specialization in games", carried out in the pre-service teachers' fourth semester of the program. Twenty-one pre-service teachers selected the course that consisted of thirteen 90-minute lessons.

(iv) *School placement.* Two three-week periods with school placement in upper secondary school carried out in the pre-service teachers' fifth and sixth semester of the program. The first period was carried out two weeks after completion of the university course, with a ten-week period between the two periods. All of the pre-service teachers who participated in the previous university course taught using the Sport Education model.

(v) *University course.* The second period of the self-selected seven-credit practical based course, carried out in the pre-service teachers' sixth semester of the program. The same pre-service teachers participated in this period, consisting of ten 90-minute lessons.

Second Academic Year		
Phase	***Course***	***Period/length***
1	University self-selected team handball course	5 weeks (10 lessons)
2	School placement in lower secondary school	4 weeks
Third Academic Year		
Phase	***Course***	***Period/length***
3	University self-selected games course (First period)	7 weeks (13 lessons)
4	School placement in upper secondary school	Two 3-week periods
5	University self-selected games course (Second period)	5 weeks (10 lessons)

Table 1. The teaching and learning experiences.

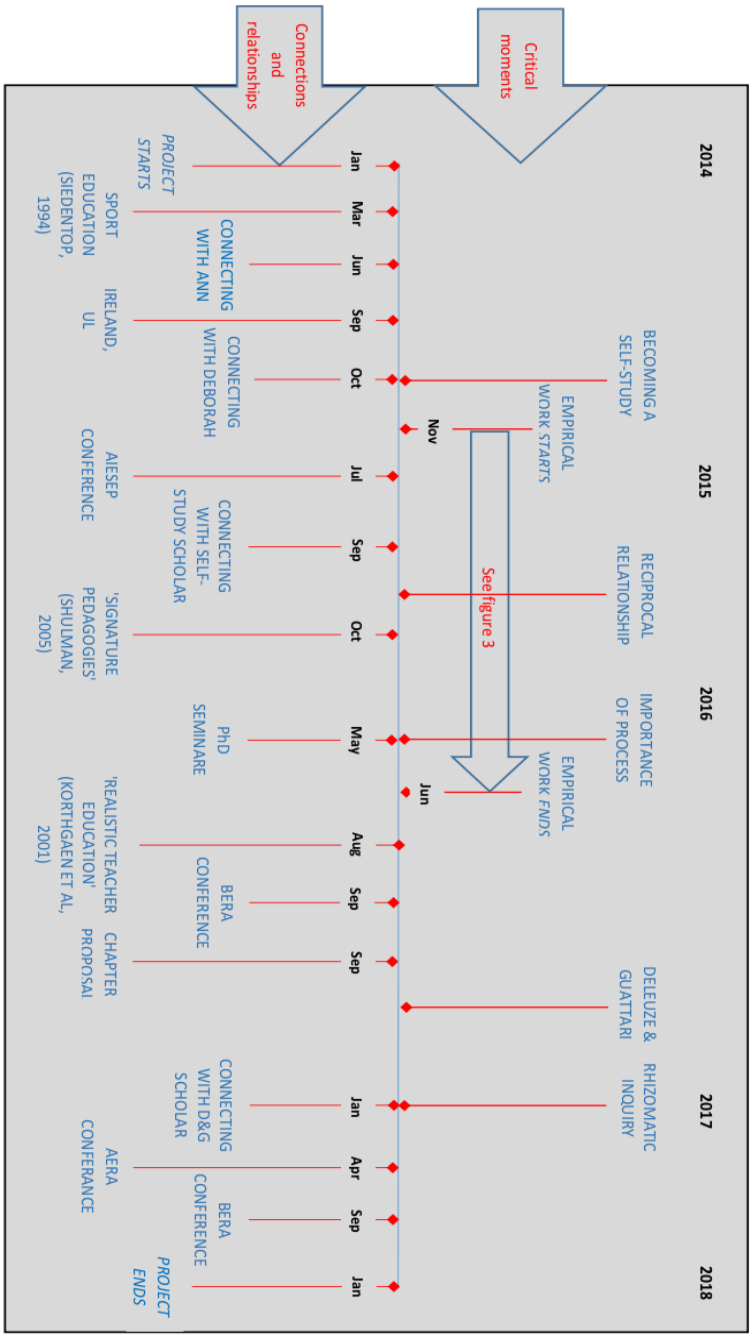

Figure 2. The longitudinal research process.

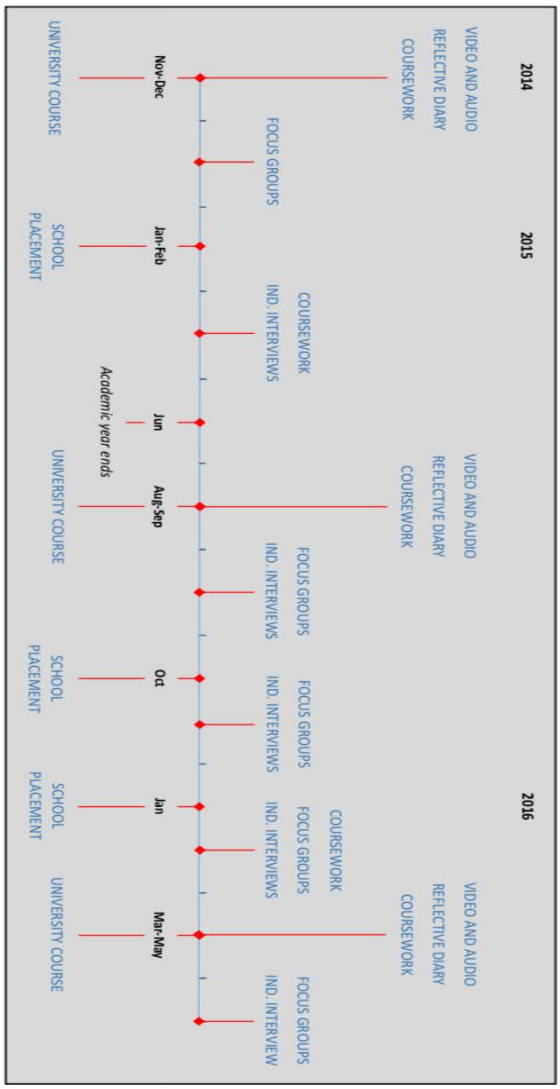

Figure 3. Empirical work of study I – IV.

Generating and analyzing qualitative data

Data in S-STEP research should generate an empirical account of self in relation to other(s) in practice, which allows a simultaneously examination of the contexts, content, and processes that influence and shape the practice (Hamilton & Pinnegar, 2014). As such, embracing the voice and the detailed nature of the self and the other (Pinnegar & Hamilton, 2009), S-STEP researchers generate data that portray the inherent complexity and diversity of teacher education practice (Berry & Loughran, 2005). I used multiple methods to generate data (Table 2 denotes the empirical work for each of the five studies):

(i) video and audio recording of each lesson of the two university courses that I taught (n = 33 lessons, 67 hours of video).

(ii) reflective diary that I wrote in developing the courses and after each lesson (n = 56 entries).

(iii) focus groups with the pre-service teachers that was conducted five times during the project with pre-service teacher teams (n = 15 focus groups). See Appendix C for protocol.

(iv) individual interviews that was conducted during the project with four pre-service teachers (n = 14 individual interviews). See Appendix C for protocol.

(v) team and individual coursework that pre-service teachers submitted after each of the five phases (see Table 1).

(vi) audio from my meetings with Lars Tore, Ann, and Deborah conducted throughout the four year doctoral period (n = 62 meetings, 85 hours audio).

This mixture of methods created a rich picture of my practice and learning from a variety of different perspectives, and allowed insight into the multiple elements influencing my professional development and practice. Acknowledging the life and schedule of the pre-service teachers (Pinnegar & Hamilton, 2009), all data (apart from the individual interviews) concerning pre-service teachers were embedded as part of their assignments (i.e., coursework) or learning (i.e., focus groups).

PhD Studies →	**Study I**	**Study II**	**Study III**	**Study IV**	**Study V**
Second academic year (Nov. 2014 – Feb. 2015)					**2014**
University course	Reflective diary Focus groups	Focus groups Coursework			7 supervisions
School placement		Ind. Interviews Coursework			**2015**
Third academic year (Aug. 2015 – May 2016)					13 supervisions
University course		Ind. interviews	Video and audio Reflective diary Focus groups	Focus groups Coursework	
School placement		Ind. Interviews	Focus groups	Focus groups	**2016**
School placement		Ind. interviews Coursework	Focus groups	Focus groups Coursework	25 supervisions
University course		Ind. interviews	Video and audio Reflective diary Focus groups	Focus groups	**2017**
					17 supervisions

Table 2. Overview of the empirical work for each of the five studies.

Analysis

Acknowledging the educational nature of a doctoral degree and my positioning in this thesis (rhizomatics, post-qualitative, and crystallization), I have engaged with multiple processes of data analysis ranging from more data driven approaches to a strong theory driven approach. The nature of these approaches reflects my non-linear, constantly evolving professional development as a teacher educator and researcher. Consequently, I will not describe the various analysis processes in this thesis. In chapter 4, I briefly explain the specific method used in each study. However, as a way to retain the trustworthiness of this thesis, I encourage readers to engage with the detailed descriptions of each analyzing process in each of the five studies contributing to this doctoral thesis.

Trustworthiness and ethics

S-STEP and rhizomatic inquiry both lend themselves towards the concept of trustworthiness (Lincoln & Guba, 1986) for demonstrating that the research is rigorous, credible, authentic, and contribute to understanding (LaBoskey, 2004; Loughran, 2007; Strom & Martin, 2017). The notion of "understanding" is particularly important as it marries the two in that S-STEP fundamentally concerns understanding the processes of practice, while rhizomatics fundamentally seeks to investigate the question of "How does it work?" in relation to practice.

Trustworthiness refers to "the degree to which other practitioners or researchers turn to, or rely on, and use the concepts, methods, and inferences of a practice as the basis of their own theorizing, research, or practice" (Mishler, 1990, p. 419). The process of trustworthiness in S-STEP is concerned with providing the examples, details, and illustrations that interrogate our practices and push forward the understanding in the teacher education community regardless of how such accounts may make the S-STEP researcher appear as teacher educator and as person (Pinnegar & Hamilton, 2009). S-STEP researchers also need to be trustworthy both in their practice and in their research on that practice. While this also is the case for other qualitative researchers, "the point is that since our practice is our research and our research is our practice, acting with integrity and establishing ourselves as trustworthy is necessary for us both in our practice and in our research accounts of it" (Pinnegar & Hamilton, 2009, p. 159).

In the five studies of this thesis, I have aimed to carry out and provide the evidence and descriptions of the research process that allow readers to judge its quality and the accuracy of the data, and the continuous process of dialogue for co-constructing understanding. Further, each of

the five studies display success and confidence but also failures and uncertainty. As such, I hope to have made visible the relational processes embedded in my practice and relived the experiences that resulted in my professional development.

One of the attractions of the multiple frames used in this doctoral thesis such as S-STEP, rhizomatics, and crystallization is the acknowledgement of the creative power of the researcher. As such, I state upfront that this doctoral thesis is a construction by me but also by a research team (Lars Tore, Ann, Deborah, and myself). The five studies and this thesis is the teams' creation, and was designed based on the teams' interests, passions, beliefs, and values. In presenting the study data, the team made "agential cuts, or decisions that shaped the story in particular ways (Barad, 2007) as well as influenced what count as data" (Strom, 2015, p. 324). Further, I recognize that the teams' positionalities, research orientations, knowledge, and experiences informed and shaped the project and its findings (see study IV).

Importantly, I acknowledge the way multiple interactive and relational processes between human and non-human elements collectively constructed my S-STEP research, and the assertions and understanding made throughout this project. As such, I argue that the involvement of a heterogenic research team with complementary knowledge and experience contributed to the trustworthiness of this doctoral thesis.

Ethical considerations

The Norwegian Social Science Data Service approved this doctoral project (see Appendix A). I informed the pre-service teachers about the project in the first lesson of the two university courses within which each pre-service teacher signed consent form(s). Pseudonyms are used for the three studies involving pre-service teachers (Studies I, II, and IV). With the exception of the pre-service teacher who is the sole participant in study II, all pre-service teachers maintain the same pseudonym throughout the project. The decision to change pseudonyms in study II was made on the basis of anonymization, considering it to be more difficult to establish the identity of the particular pre-service teacher.

Another important consideration with respect to pre-service teachers is how I present their voice in the study findings. I aimed to do justice to pre-service teachers' voices, considering the variation of experiences and opinions in the group.

An ethical consideration and choice I made that differs from many other S-STEP (e.g., Ní Chróinín et al., 2017) is that I conducted and participated in the interviews and focus groups. There

were two reasons for this choice. First, my social constructivist stance allowed me to consider the pre-service teachers and myself as co-constructing knowledge, understanding, and experiences. Second, taking a rhizomatic perspective, I appreciate that the understanding derived from this doctoral project represents *a* reality, not *the* reality. Importantly, however, I changed my position in the focus groups after the first round of data generation. This decision was based on a reflection that pre-service teachers in the first focus groups appeared to strive to provide "correct" answers to their teacher educator. Subsequently, it was decided that Lars Tore would function as the mediator in the other focus groups, while I took a position between that of facilitator and participant.

CHAPTER 4: DIFFERENT STUDY BECOMINGS

In this chapter I present the five studies that comprise this doctoral thesis, with particular focus on the study findings. Each study aim and research question(s), theoretical framework, methodology, and findings is presented as a traditional abstract. Importantly, I consider each study as different *becomings*, rather than thesis findings, as I recognize each study as lines of flight, as opportunities to become-who-I-am-not-yet, rather than truths I "found" in the data or in the "findings" of each studies.

Acknowledging the expectation of providing a summary of "findings", I hope readers appreciate the difficulty of conveying processes of practice in this chapter. Thus, I encourage readers simultaneously to connect with the five studies. Due to carrying out a longitudinal doctoral project, the empirical work of different studies run parallel to each other. Consequently, I have ordered the studies by considering not only the empirical work (see Figure 4) but also the theoretical frame used in each study. The intention is that the order will allow readers insight into the non-linear, constantly evolving process of professionally developing as a teacher educator.

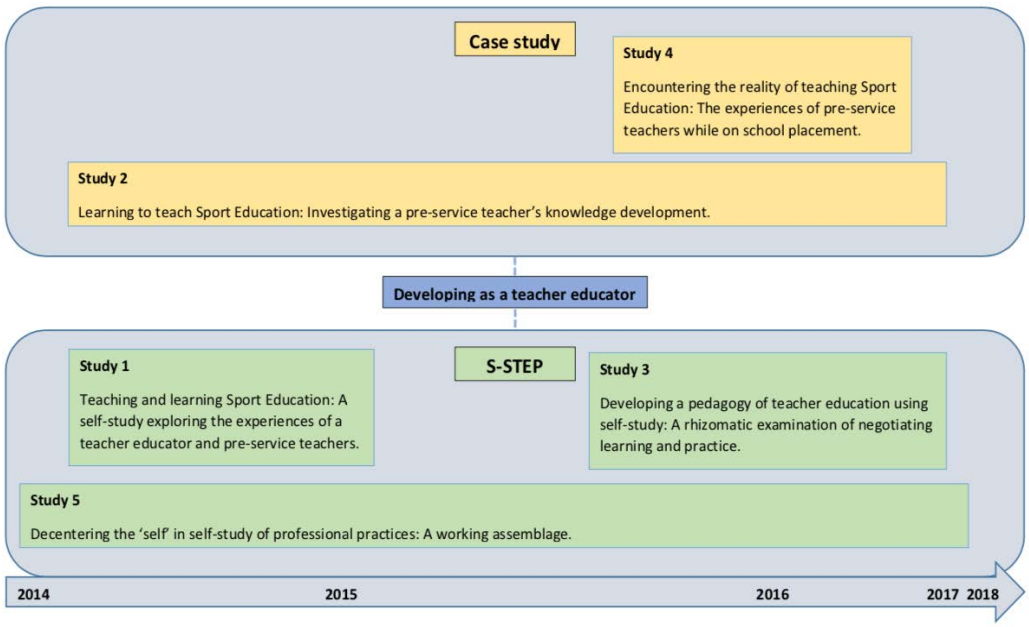

Figure 4. Overview of each of the five studies contributing to this doctoral thesis.

Study I: Teaching and learning Sport Education

Hordvik, M., MacPhail, A., & Ronglan, L. T. (2017a). Teaching and learning Sport Education: A self-study exploring the experiences of a teacher educator and pre-service teachers. *Journal of Teaching in Physical Education*, 36(2), 232-243.

Aim and research question: The aim of this S-STEP was to articulate and share my knowledge and understanding of teaching and learning Sport Education in physical education teacher education. The following research questions were explored, (a) "How did the teacher educator experience teaching about teaching Sport Education?" And, (b) "How did the pre-service teachers experience learning about teaching Sport Education?"

Theoretical framework: Shulman's (2005) notion of signature pedagogies was used as a way to expose readers to a theoretically informed critique of the six Sport Education key characteristics. Signature pedagogies are both pervasive and routine, cutting across topics and courses, programs and institutions; they nearly always entail public student performance, encouraging pre-service teachers to be both active and interactive; and uncertainty, visibility, and accountability inevitably raise the emotional stakes of the pedagogical encounters (Shulman, 2005).

Methodology: This S-STEP involved twelve pre-service teachers and myself taking part in a university course. Data were generated through my open-ended reflective diary and focus groups with three pre-service teacher teams (see Table 3). A general inductive approach (Thomas, 2006) was employed to analyze the data.

Findings: The study highlighted the interrelated and complicated relationship between teaching and learning about teaching. First, multiple tensions were created in the learning environment because my teaching did not fully account for the pre-service teachers' backgrounds and expectations. Second, understanding the full intentions of Sport Education was constrained due to the pre-service teachers', and my own, unfamiliarity with the model. Third, while I struggled to switch between modeling teaching of Sport Education and articulate the nature of that teaching, pre-service teachers centered their attention towards learning the content and acquiring teaching strategies.

The diverse experiences in this study conveyed the various tensions inherent in physical education teacher education practice, emphasizing the voice of both the teacher educator and pre-service teachers as regards experiences and perspectives. The various challenges experienced by the pre-service teachers and myself further enhanced the complexity of Sport Education, encouraging researchers to use a theoretical lens examining the complexity of teaching Sport Education rather than focusing solely on the delivery of the six key characteristics.

PhD Studies →	**Study I**	Study II	Study III	Study IV	Study V
Pre-service teachers' second academic year					
University course	**Reflective journal** **Focus groups**	Focus groups Coursework			2014 Audio of 7 supervisions
School placement		Ind. interview Coursework			
Pre-service teachers' third academic year					2015 Audio of 13 supervisions
University course		Ind. interview	Video and audio Reflective journal Focus groups	Focus groups Coursework	
School placement		Ind. interview	Focus groups	Focus groups	2016 Audio of 25 supervisions
School placement		Ind. interview	Focus groups	Focus groups Coursework	
University course		Ind. interview	Video and audio Reflective journal Focus groups	Focus groups	2017 Audio of 17 supervisions

Table 3. Overview of the empirical work for study I.

Study II: A pre-service teacher's knowledge development

Hordvik, M., MacPhail, A., & Ronglan, L. T. (2017b). The process of learning to teach Sport Education: Investigating the development of teacher knowledge as a pre-service teacher. *Sport, Education and Society*. doi:10.1080/13573322.2017.1322948

Aim and research question: The aim of this study was to investigate a pre-service teacher's continuing process of learning to teach Sport Education as part of a physical education teacher education program and while teaching during the school placement component of the physical education teacher education program. The study was guided by the question, "How does a pre-service teacher's knowledge of teaching and learning Sport Education develop?"

Theoretical framework: The three-level model of learning (Korthagen & Lagerwerf, 1996) was used as a framework to investigate the pre-service teacher's continuing learning process. The three-level model illustrates levels in pre-service teachers' professional learning traversing between the gestalt, schema and theory level. "Level reduction" occurs when the relevant schema or theory needs less attention during one's actions within which the schema or theory are reduced to an unconscious gestalt.

Methodology: This case study involved one pre-service teacher learning to teach Sport Education. The learning experience was composed of four courses (two university content courses and two school placements) divided into five phases. Data generation employed five semi-structured individual interviews, coursework and a focus group (see Table 4). Data were analyzed using a hybrid approach of inductive and deductive theme development.

Findings: This study highlighted the longitudinal non-linear nature of a pre-service teacher's Sport Education learning process, producing an understanding about the interconnection of content, process and contexts in learning to teach.

The study conveyed that the pre-service teacher's knowledge development involved three levels. First, the pre-service teacher required a considerable amount of learning experiences in developing awareness of teaching and learning Sport Education. Challenging situations represented an important experience in the pre-service teacher's developing awareness of the relationship

between teaching and learning. Second, through reflection, further school placement experiences and university learning experiences, the pre-service teacher developed a conscious understanding of teaching and learning Sport Education. Thirdly, after the final university learning experience, the pre-service teacher was able to connect Sport Education aspects to a broader philosophy of teaching and learning. Studying the relationships between Sport Education concepts, while connecting them with knowledge from various physical education teacher education courses, the theoretical foundation of the model became accessible for the pre-service teacher.

While further adding to the conceptualization of Sport Education as a complex pedagogical model, this study suggested that a comprehensive learning experience can result in pre-service teachers developing knowledge about teaching and learning that goes beyond learning to teach a particular pedagogical model. Sport Education can therefore be considered as a tool to operationalize practice on an abstract level in which theory is understood through practice.

PhD Studies →	Study I	**Study II**	Study III	Study IV	Study V
Pre-service teachers' second academic year					
University course	Reflective journal Focus groups	**Focus groups** **Coursework**			2014 Audio of 7 supervisions
School placement		**Ind. interview** **Coursework**			
Pre-service teachers' third academic year					2015 Audio of 13 supervisions
University course		**Ind. interview**	Video and audio Reflective journal Focus groups	Focus groups Coursework	
School placement		**Ind. interview**	Focus groups	Focus groups	2016 Audio of 25 supervisions
School placement		**Ind. interview** **Coursework**	Focus groups	Focus groups Coursework	
University course		**Ind. interview**	Video and audio Reflective journal Focus groups	Focus groups	2017 Audio of 17 supervisions

Table 4. Overview of the empirical work for study II.

Study III: Negotiating learning and practice in teacher education

Hordvik, M., MacPhail, A., & Ronglan, L. T. (Under review, submitted December 13, 2017). Developing a pedagogy of teacher education using self-study: A rhizomatic examination of negotiating learning and practice. *Journal of Teacher Education.*

Aim and research question: This study aimed to examine my process of developing a pedagogy of teacher education. The study was guided by the question, "How does a teacher educator negotiate his learning and practice within a one-year self-study as he develops a pedagogy of teacher education?"

Theoretical framework: I engaged with rhizomatics (Deleuze & Guattari, 1987), a theoretical lens that emphasizes relationships among a multitude of interacting variables in a given social situation such as teaching. Particularly, the concept of "assemblage" was employed to allow a consideration of myself as only one of multiple elements contributing to the practice enacted.

Methodology: This S-STEP involved twenty-one pre-service teachers and myself taking part in a university course divided into two periods. Multiple sources (video and audio, reflective diary, and focus groups) were employed to generate data (see Table 5). Data were analyzed employing traditional qualitative analytic conventions such as coding with situational analysis (See Appendix D) (Clarke, 2003) and rhizomatic mapping (See Appendix E) (Deleuze & Guattari, 1987).

Findings: The study highlighted the complexity of teacher education learning, emphasizing how teacher educator practice becomes a collectively negotiated enterprise produced by a conflux of human and non-human elements.

This study conveyed how multiple elements such as myself (my eagerness to teach perfectly, level of familiarity with Sport Education and teaching about teaching), the pre-service teachers (their level of familiarity Sport Education, expecting a focus on content, familiar with experiencing mastery in physical education), Sport Education (its multiple teaching and learning features), the program and course tradition (no use of particular pedagogical models and a main focus on practicing content in practical courses), and the nature of teacher education pedagogy (an expectation to articulate the what, how and why of teaching) influenced my practice and learning.

This encouraged a conceptualization of the development of teacher education pedagogy as assemblage. That is, by examining the multiple human and non-human elements and considering how they work together to produce practice and learning, teacher education researchers can better understand the complex relationship between teaching about teaching and learning about teaching, and particularly the way non-human elements influence the relationship. Furthermore, this study suggested that I was constantly becoming-different in relation to the constellation of elements, forces and influences occurring in the classroom at any given time.

PhD Studies →	Study I	Study II	**Study III**	Study IV	Study V
Pre-service teachers' second academic year					2014 Audio of 7 supervisions
University course	Reflective journal Focus groups	Focus groups Coursework			
School placement		Ind. interview Coursework			2015 Audio of 13 supervisions
Pre-service teachers' third academic year					
University course		Ind. interview	**Video and audio Reflective journal Focus groups**	Focus groups Coursework	2016 Audio of 25 supervisions
School placement		Ind. interview	**Focus groups**	Focus groups	
School placement		Ind. interview	**Focus groups**	Focus groups Coursework	2017 Audio of 17 supervisions
University course		Ind. interview	**Video and audio Reflective journal Focus groups**	Focus groups	

Table 5. Overview of the empirical work for study III.

Study IV: Pre-service teachers' school placement experiences

Hordvik, M., MacPhail, A., & Ronglan, L. T. (Under review, submitted January 3, 2018). Encountering the reality of teaching Sport Education: The experiences of pre-service teachers while on school placement. *Physical Education and Sport Pedagogy*.

Aim and research question: The aim of this study was to investigate pre-service teachers' experiences of teaching Sport Education in diverse school contexts. The study was guided by the question, "Given common experiences of a university course, how do pre-service teachers negotiate their Sport Education learning experience during school placement?"

Theoretical framework: I engaged with "assemblage", a rhizomatic (Deleuze & Guattari, 1987) concept that allows a consideration of the various components of the classroom (the pre-service teachers, the students, the content, the classroom, and so on) as working collectively to shape teaching.

Methodology: This case study involved twenty-one pre-service teachers undertaking a six- week school placement divided into two periods. Data generation employed pre-service teacher coursework and focus groups conducted with three pre-service teacher teams before, during and after school placement (see Table 6). Data were analyzed employing traditional qualitative analytic conventions such as coding with situational analysis (Clarke, 2003) and rhizomatic mapping (Deleuze & Guattari, 1987).

Findings: The study highlighted a multitude of challenges pre-service teachers encounter when teaching on school placement, and how the connection and interaction between key elements influence pre-service teachers' experiences and described practices.

The pre-service teachers participated in the same Sport Education course and each pre-service teacher team had developed a Sport Education season design template. Regardless of such commonalities, the pre-service teachers' experiences and described practices were strikingly different. Some pre-service teachers were able to successfully enact the key ideas from Sport Education and their corresponding template (e.g., stable student teams, student roles, and a festive culminating event). In contrast, other pre-service teachers struggled to allocate students to stable

teams and refrained from introducing defined student roles.

This study conveyed how multiple elements such as the pre-service teacher (belief in and familiarity with Sport Education, background), students (their maturity level, experience with Sport Education, attendance), Sport Education features (stable teams, roles and student responsibility), and context (negative cooperating teacher, facilities, class size) influenced pre-service teachers' experiences and described practices.

This study suggested that key differences between the pre-service teachers, their contexts, their students, the features of Sport Education and the ways the unique set of different elements comprising each class interacted explain the different experiences and practices of pre-service teachers.

PhD Studies →	Study I	Study II	Study III	**Study IV**	Study V
Pre-service teachers' second academic year					2014 Audio of 7 supervisions
University course	Reflective journal Focus groups	Focus groups Coursework			
School placement		Ind. interview Coursework			2015 Audio of 13 supervisions
Pre-service teachers' third academic year					
University course		Ind. interview	Video and audio Reflective journal Focus groups	**Focus groups Coursework**	2016 Audio of 25 supervisions
School placement		Ind. interview	Focus groups	**Focus groups**	
School placement		Ind. interview	Focus groups	**Focus groups Coursework**	2017 Audio of 17 supervisions
University course		Ind. interview	Video and audio Reflective journal Focus groups	**Focus groups**	

Table 6. Overview of the empirical work for study IV.

Study V: The processes of decentering the 'self'

Hordvik, M., MacPhail, A., Tannehill, D., & Ronglan, L. T. (Accepted, September 4, 2017). Decentering the 'self' in self-study of professional practices: A working assemblage. In K. Strom, T. Mills, & A. Ovens (Eds.), *Decentering the researcher-subject in intimate scholarship: Complex, materialist, and posthuman methodological perspectives*: Emerald Books.

Aim and research question: The aim of this study was to deliberately reframe the self and the relationship between the self and the other in the S-STEP methodology. The objective was to engage with the research assemblage to investigate its function and production, using the analytic question, "How does a post-qualitative research assemblage work to decenter the 'self' in self-study of teacher education practices?"

Theoretical framework: I engaged in a process of "thinking with" (Jackson & Mazzei, 2012) the rhizomatic concept of "assemblage" (Deleuze & Guattari, 1987). That is, in order to produce different understandings of the knowledge construction in S-STEP, I was thinking with Deleuze and Guattari's assemblage to turn the practice into something different, and use the practice to push the concept of assemblage to its limits.

Methodology: In this S-STEP, assemblage was "plugged in" into the data from supervisory meetings between Lars Tore, Ann, Deborah, and myself. These meetings were carried out throughout the four-year doctoral period and included individual meetings between myself and Lars Tore or Ann, between the three of us, between Deborah and myself, and between Ann, Deborah, and myself. While not every single meeting was recorded, the captured data included 62 meetings (see Table 7).

Findings: This study highlighted the nonlinear and fundamentally relational process of constructing understanding in S-STEP, arguing that my researcher-self was disrupted and decentered through multiple processes of "coming into composition". That is, my research practice and understanding was co-constructed by the ways the constellation of human and non-human elements comprising the research-assemblage combined and interacted.

In this way, each element, both human and non-human, functioned as active agents in joint

production of the understanding that was constructed. Instead of viewing self in S-STEP as an ego-centric self, in a Deluzian and Guattari lens self is understood as being co-produced through the constellation of elements functioning collectively to produce different becomings. Viewing self, practice, and knowledge production in S-STEP as coming into composition provides an alternative that decenters the conceptualization of self, and self and the other, in the methodology.

PhD Studies →	Study I	Study II	Study III	Study IV	Study V
Pre-service teachers' second academic year					
University course	Reflective journal Focus groups	Focus groups Coursework			**2014** **Audio of 7 supervisions**
School placement		Ind. interview Coursework			**2015** **Audio of 13 supervisions**
Pre-service teachers' third academic year					
University course		Ind. interview	Video and audio Reflective journal Focus groups	Focus groups Coursework	**2016** **Audio of 25 supervisions**
School placement		Ind. interview	Focus groups	Focus groups	
School placement		Ind. interview	Focus groups	Focus groups Coursework	**2017** **Audio of 17 supervisions**
University course		Ind. interview	Video and audio Reflective journal Focus groups	Focus groups	

Table 7. Overview of the empirical work for study V.

CHAPTER 5: TEACHER EDUCATOR PROFESSIONAL DEVELOPENT: A RHIZOMATIC CONSIDERATION

This doctoral thesis aims to add to research on processes of teacher educator professional development. I aim to contribute to the establishment of a robust, research-based knowledge base for teacher educators with specific focus on beginning teacher educators. Particularly, the purpose of this thesis is to investigate my teacher education teaching and research practice. That is, I consider the processes of a beginning teacher educator's practices, experiences, contexts and knowledge construction.

In this chapter I discuss the five studies, engaging in a process of "thinking with" (Jackson & Mazzei, 2012) the rhizomatic concept of assemblage. As such, I have engaged in a process of reading the study manuscripts over and over while thinking with assemblage, aiming to show how the studies and assemblage "*make one another*" (p. 5). What "*emerged in the middle*" (p. 5) of plugging assemblage into the studies and studies into the assemblage, was the thesis purpose that I have used as an analytic question, "How does a teacher educator negotiate his teaching and research practice as he develops professionally?" The process of reading the studies and plugging the analytic question into the studies and the study into the question, produced lines of flight that provoked me to reorganize, adapt, and enhance my systems of thinking (Ovens, Garbett, et al., 2016) about teacher educator practice, pedagogy, and learning.

In this discussion, I draw on examples from the studies and the concept of assemblage, and argue that teacher educators are part of a constantly evolving assemblage that co-produce different practice, pedagogy, and learning. To help readers acknowledge my lines of thinking, I begin this chapter by looking at the connection and interaction between the five studies. Second, I discuss the concept of assemblage and the way assemblage worked in my teaching and research practice. Third, I discuss the processes of the interrelated relationship of teacher education pedagogy. In this section, I begin considering the interaction between the pre-service teachers and myself, before discussing how non-human elements influenced the relationship. Finally, I discuss the non-linear and ever-evolving learning as a teacher (educator).

Producing lines of thinking differently about practice, pedagogy, and learning

Five different but interrelated studies comprise this doctoral thesis. Looking at the different studies and particularly the study findings, this section aims to discuss the ways these studies work together to produce thinking about teacher education practice, pedagogy, and learning. Importantly, while unpredictable relationships and interactions together with the study findings produced unpredictable research practice, the five studies of this doctoral thesis is all interrelated and connected to the evolving thesis aim, purpose and research question.

Study I conveyed that my teaching practice represented a break from the status quo practice of physical education in Norway and the specific physical education teacher education program. Particularly, the study highlighted: (i) how pre-service teachers' backgrounds, expectations and experiences created tensions in the teaching and learning environment, (ii) the complexity of the Sport Education model, and (iii) the difficulty for teacher educators to carry out the expectations of articulating the nature of teaching. Study I supported the notion of the interrelated relationship of teacher education (Loughran, 2006), while conveying that the Sport Education model and the nature of teacher education pedagogy influence the relationship and the teacher educator's teaching practice. As such, this study provided insight into the (inter)relational aspects of teaching and learning about teaching. The study produced lines of change in my understanding of teacher educator practice that encouraged thinking in genuine complex ways about the relationships comprising teacher education.

Study II conveyed the non-linearity of pre-service teacher learning and the interconnection of content, process and contexts in learning to teach. While using a rather linear framework (i.e., three-level model of learning), this study supported researchers (Glotova & Hastie, 2014) arguing for a longitudinal knowledge development of teaching (Sport Education). Although not centering its attention towards teacher educator practice and learning, this study provided insights into the non-linear nature of a pre-service teacher's learning process. The study produced lines of change in my understanding of pre-service teachers' learning process and the need to develop coherent teacher education programs that more genuinely prepare pre-service teacher for the reality of teaching.

Study I and study II interacted in two ways. First, they provided an understanding of the (lack of) link between teacher education practice and pre-service teachers' learning. Second, the

longitudinal nature of my S-STEP allowed the non-linear, relational, and complex appreciation developed in study I and study II to influence the subsequent studies. As such, in the last three studies of this doctoral project a new theoretical lens (i.e., Rhizomatics - Deleuze & Guattari, 1987) was used to analyze the processes of practice and learning. Rhizomatics encourages a focus on the how and why of the challenges and tensions reviled in study I and study II. Subsequently, the focus shifted more explicitly from outcomes towards the process of teacher education.

Study III and study IV are inextricably linked. A focus on the process of teaching and learning requires researchers to provide readers detailed insight into the interactions and relationships unfolding in practice. Subsequently, it was decided to divide the data set and produce an in-depth understanding of the process of teacher educator practice and pre-service teachers' school placement experiences. The two studies interact in the way they convey how negotiations and evolving experiences continuously shape teaching and learning.

Study III and study IV highlighted the ways multiple human and non-human elements combined and interacted, co-producing teacher educator practice and pre-service teachers' school placement experiences. While study I and study II reported that human and non-human elements influence practice, study III and study IV reviled the way these elements combined and interacted. Study III further highlighted that as elements change, the practice also changes, producing different teacher educator becomings. As such, study III and study IV produced lines of understanding teacher (educator) practice and professional development as an ongoing, dynamic and constantly evolving process shaped by a multitude of human and non-human influences and forces (Ovens, Garbett, et al., 2016; Ovens, Strom, et al., 2016).

Study V interacted with the other studies through the attention on the processes of my S-STEP research practice. The study conveyed how a unique set of human and non-human elements comprising the S-STEP combined and interacted to co-produce particular research practice and understanding. Study V highlighted the fundamentally relational nature of S-STEP research, arguing that my researcher-self was decentered as I functioned as only one of multiple elements producing research practice and understanding.

Subsequently, the five studies collectively provide lines of flight or lines of thinking differently about teacher education practice, the interrelated relationships in teacher education pedagogy and teacher (educator) learning.

Teacher educator practices as assemblage

With a rhizomatic lens, every human and non-human element is a multiplicity composed of heterogenic elements. The teacher educator is a multiplicity (composed of a background, experiences, beliefs, languages, cultures, and investments) within a classroom multiplicity (composed of the pre-service teachers, the content, the room environment itself) within other multiplicities (the university, social, and political multiplicity composed of particular knowledge, structures, traditions, and policies). In this view, the teacher educator is part of a larger multiplicity influencing practice. I argue that a consideration of the world as multiple encourages a conceptualization of teacher educators' practice as assemblage.

Assemblage refers to how a mixture of human and non-human multiplicities work together to produce something. Extending the concept of assemblage to this doctoral project, the mixture of multiplicities in the classrooms and supervisory meetings can be considered assemblages, each functioning to construct particular practice and understanding. Specifically, I argue that assemblage functioned as two layers in this doctoral project: classroom-assemblage and research-assemblage.

First, the classroom-assemblage was composed of the mixture of elements comprising the university and school classrooms. For example, the university-assemblage was composed of myself, the pre-service teachers, and non-human multiplicities such as Sport Education, expectations of teacher education pedagogy, curriculum, and tradition. Each of the pre-service teachers' school placement classroom was composed of the pre-service teacher, students, cooperating teacher, facilities, curriculum, and tradition. I argue that the ways these multiplicities connected and interacted co-constructed the teaching practice.

Second, the research-assemblage was composed of Lars Tore, Ann, Deborah, myself, and non-human multiplicities such as generated data, analyzing methods, theories, reviews, room environment, and cultures that co-constructed particular research practice and understanding. This notion of research-assemblage can be further extended to my office, for example when drafting articles for publication or this doctoral thesis. As such, each day in my office functioned as a research-assemblage composed of particular multiplicities connecting and interacting to produce a particular text or particular understanding.

For example, writing this section, I am seated in my office in front of the computer. My computer stores drafts of articles, generated data, Google, Word, and journal articles. The desk is covered with books and journal articles about rhizomatics, teacher education, teacher educator

professional development and S-STEP, while the bookshelf is filled with books about learning theory, methodology, teaching, coaching, Sport Education. The way my multiplicity (my present background, relationships, experiences, beliefs, knowledge) connect to and interact with the multiplicities of the computer, the study articles and the international literature, co-produce this text. I argue that if this thesis had been co-constructed without the research-assemblage considering the voices of pre-service teachers or entering into a relationship with Deleuze and Guattari, I would most likely have been thinking in more linear ways although still wishing to illustrate the complexity of teaching and learning.

Study V further conveyed how the research-assemblage functioned to produce particular research practice and understanding. For example, the relationship with Ann and Deborah worked to increase the heterogeneity of the assemblage as they challenged Lars Tore's and my thinking. The way Ann's and Deborah's multiplicities (their different experiences, knowledge, cultures), and the ideas they introduced to the research-assemblage, combined and interacted with me, Lars Tore, and the research plan, produced different thinking and understanding.

Study III conveyed how the classroom-assemblage functioned to produce particular practices. For example, in the beginning of the second university course, multiple elements constrained my practice (i.e., my limited experience of teaching about teaching, and my and the pre-service teachers' limited experience with the comprehensiveness of Sport Education). Combined with my personality (i.e., eager to teach perfectly) and beliefs (resulting in me implementing multiple features of Sport Education, using extensive periods of time explaining the features to pre-service teachers as prospective teachers, and requiring pre-service teachers to engage in extensive discussion), the connections and interactions between the mixture of multiplicities co-produced a chaotic practice. Furthermore, through multiple negotiating processes (with myself through self-reflection, and with the pre-service teachers by interacting with them and displaying my vulnerability) combined with evolving teaching and learning experiences, particular conditions in the classroom changed (i.e., shared agreement between the pre-service teacher and I on lesson structure, pre-service teachers' and my growing understanding about teaching and learning features). As such, the mixtures of multiplicities connected and interacted differently, co-producing a more harmonized practice.

The interrelated processes of teacher educator pedagogy

Another line of thinking arising from this doctoral thesis concerns the understanding of emotions, ambiguity, and tensions teacher educators encounter when enacting and developing a pedagogy of teacher education (Berry, 2007; Ritter, 2011). From the thinking articulated in the above section, this doctoral thesis conveys how tensions and ambiguity are created by the connections and interactions between elements in the classroom-assemblage, and subsequently not solely inherent in the teacher educator.

Below I consider the processes of the interrelated relationship between teaching and learning about teaching. I discuss how tensions and ambiguities were created by relational and inter-relational relationships between human and non-human elements (Strom & Martin, 2017). In this way, the development of a pedagogy of teacher education is relational as multiple actors, forces, and materials influence the enactment. However, a pedagogy is also multidirectional as these actors, forces and materials vary by their nature and draw their lines in different directions.

I begin by considering the interactions between the pre-service teachers and myself, highlighting the importance of meaningful relationships in teacher educator practice. Then, I consider the processes of interaction between human and non-human elements in the different classroom-assemblages of this thesis. In this final section I aim to show the process of my practice and learning with special attention to the relationship between teaching and learning.

Teacher educator and pre-service teacher relationships

Despite teacher educators' position as leader in the formal hierarchy between teacher educator and pre-service teacher, conceptualizing practice as assemblage provides pre-service teachers with sufficient agency to pursue their alternative goals. This leaves the teacher educator without the capacity to ensure tight control over the teaching and learning process and its outcomes. For example, each pre-service teacher and I brought with us a personal interest to the classroom. While many of the pre-service teachers appeared to view the primary function of physical education teacher education to develop their sport skills and teaching techniques (e.g., Fletcher & Casey, 2014; Mordal-Moen & Green, 2014b), others were interested by, and became attracted to, my different practice ambition (e.g., the pre-service teacher in study II). That is, I aimed to teach pre-service teachers about teaching a student-centered approach (i.e., Sport Education) while trying to enact a pre-service teacher-centered approach. As such, rather than confirm the pre-service

teachers' beliefs about physical education (Mordal-Moen & Green, 2014a), my ambition was to challenge their views as well as my established teaching practice.

Meaningful practice and relationships within such a pre-service teacher-centered approach requires genuine participation and engagement from both pre-service teachers and the teacher educator. In this way, pre-service teachers are important co-producers of meaningful practice, e.g., creating learning experiences where I required pre-service teachers to discuss their experience as learners and my teaching. However, as study I and particular study III convey, pre-service teachers' engagement in such learning experiences varied. In one lesson or situation, few pre-service teachers, or even none, took part in the discussion while in another lesson or situation several pre-service teachers engaged.

For example, my different practice in the beginning of the second university course combined with pre-service teachers' prior experiences, beliefs, and expectations created conditions where many of the pre-service teachers showed low engagement towards my effort to engage them in discussions about the nature of teaching. On other days, maybe after pre-service teachers had developed an appreciation towards Sport Education's teaching and learning features combined with an acknowledgement of my practice, they showed higher degree of engagement in the discussions.

Subsequently, study I and study III show the ways teacher educator–pre-service teacher relationships and pre-service teacher–pre-service teacher relationships heavily shape teaching practices, and the relationship between teaching and learning. Subsequently, as other researchers argue (Fletcher, 2014; Ní Chróinín et al., 2017), interacting and building relationships with pre-service teachers is vital for the development of meaningful relationship between teaching about teaching and learning about teaching.

Importantly, this thesis suggests that the development of relationships is not a seamless and linear process that progresses from meaningless to meaningful. It is a process in flux, filled with resistance, ambiguities, and tensions.

The relational and inter-relational processes of practice

From a rhizomatic perspective (Deleuze & Guattari, 1987; Hultman & Lenz Taguchi, 2010), the material world (e.g., Sport Education) and even the non-tangible (e.g., traditions) have the capacity to influence, and can shape, teacher educator practice just as much as human actors (Strom & Martin, 2017). Further, elements in the classroom are always in flux, constantly changing influence on practice. As particular elements or conditions in the classroom change, the mixture of elements

work together differently, co-constructing different practices and relationships (Strom & Martin, 2017).

I discuss below how negotiation processes, evolving experiences and new elements entering the classroom worked to change my practice and the relationship between teaching and learning. The center of my attention is on how I continuously worked to balance and manage the resistance, ambiguities, and tensions created by the mixture of elements in my practice. While arguing that I had limited control of the teaching and learning process, I acknowledge that I exerted profound influence on practice, and the teaching and learning environment.

This doctoral thesis conveys how contextual elements represented a profound influence on my practice. That is, the tradition of physical education and teacher education in Norway, and the particular teacher education program, the nature of teacher education pedagogy, and the pre-service teachers' and my own unfamiliarity with Sport Education's teaching and learning features. I argue that the ways these contextual elements interacted with and connected to the pre-service teachers and myself, worked to create a practice filled with resistance and ambiguity, and tensions in the teaching and learning relationship.

Study I conveyed that because of the rather traditional practice in Norwegian physical education (Aasland et al., 2017), in entering the first university course neither the pre-service teachers or I were familiar with a student-centered approach to teaching. In addition, the tradition of practical courses within the program created expectations that pre-service teachers should develop pedagogical content knowledge of team handball mainly through practical experiences (i.e., being physically active). Aware of this, I taught using Sport Education (i.e., a student-centered approach), while using time to introduce components of the model, and explain the how and why of my teaching. Taken together, this created pre-service teacher frustration and resistance in my practice.

For example, pre-service teachers did not appreciate the theoretical introduction making it difficult for me to engage them in discussion about Sport Education. While I noticed pre-service teachers' frustration towards the lesson content, I continued to pursue my goals for their learning. Combined with the pre-service teachers' and my unfamiliarity with the specific teaching and learning features of Sport Education, this created ambiguities in my practice within which I began questioning my abilities as teacher educator.

While the learning experience in study I worked to negotiate some of the resistance and

tensions created by the ways the pre-service teachers and I connected to and interacted with the contextual elements, study III conveyed how the context again increased its influence going into the second university course. While six of the pre-service teachers in study III also took part in study I, fourteen different pre-service teachers entered the classroom in the second course. One could have expected to gain support from the six pre-service teachers' familiarity with my specific practice ambition for this course. However, study III shows that the same pre-service teachers reverted to their previous socialization into the physical education teacher education program together with a strong established course tradition (i.e., focusing on the content of untraditional games). While I made changes in my practice and lesson structure (e.g., no theoretical introduction in each lesson) to reduce the resistance, my continued different practice ambition, combined with pre-service teachers' expectations and interests created even stronger resistance to my practice in this course.

For example, several pre-service teachers expected to be mainly physically active in lessons. Not appreciating the lesson structure, pre-service teachers' frustration increased when only allowed limited time playing the game. Combined with the difficulty of enacting the Sport Education responsibilities, pre-service teachers developed a critical notion towards my practice, complaining and questioning both the model and the requirement of extensive time reflecting and discussing their experiences. The course tradition, combined with my perfect teaching ambition, created ambiguity in my practice. Sensing the tension between pre-service teachers' expectations and interest for learning and my pursued goals for their learning, I became overly conscious and uncertain about what the pre-service teachers were thinking and doing. For example, I was always aware of, and reflected on, pre-service teachers' facial expressions, their interest for attending class, and what they were thinking about when required to discuss teaching and learning.

Study III conveyed how I engaged in multiple negotiating processes (with the pre-service teachers by interacting with them and displaying vulnerability, and with myself through self-reflection) as a way to balance and cope with the resistance and ambiguity created by the connections and interactions in my practice. For example, I continuously required pre-service teachers to reflect on, discuss and question both the content and my practice. While such situations produced a lot of personal vulnerability, it enabled me to both explain the purpose of my practice, and provide insights into the insecurity I experienced and decisions I made before and during lessons. Combined with changing the lesson structure based on pre-service teachers' suggestions

and the evolving teaching and learning experiences, I was able to reduce the resistance to my practice to a manageable degree.

Study IV conveyed that pre-service teachers took different beliefs about Sport Education into their school placement teaching. Combined with pre-service teachers' limited teaching experience and multiple contextual influences, this created different degrees of resistance in their teaching. Pre-service teachers experienced that students had limited experience with a student-centered approach. Other pre-service teachers found that their cooperating teacher reinforced pre-service teachers' negative experiences and beliefs, with some cooperating teachers suggesting pre-service teachers discontinue the use of Sport Education. Some pre-service teachers experienced that features of Sport Education combined with engaged students worked to facilitate their teaching. Subsequently, the school placement experiences influenced and changed several of the pre-service teachers' beliefs about how applicable Sport Education was in schools. Entering the second period of the university course, the common pre-service teacher belief was that Sport Education was more or less applicable in teaching physical education, depending on particular student characteristics.

Study III showed how pre-service teachers' strong expectations towards the course content combined with their beliefs about Sport Education and previous learning experiences with Sport Education, increased the tension between the pre-service teachers and my interest and goals for the last period of the university course. I needed to decide whether to follow my preferred direction, or consider pre-service teachers' needs and concerns. As a way to balance the resistance and subsequently hope to retain the relationship with the pre-service teachers, I chose to adjust the content and my practice with respect to the pre-service teachers' interest. Teaching with both the course tradition and my previous established teaching practice in mind reduced the amount of resistance in my practice while at the same time created a practice where I struggled to engage pre-service teachers in reflection and discussion about the nature of teaching.

Subsequently, while the combination of elements worked to produce a high degree of pre-service teacher resistance and teacher educator insecurity in the first period of the course, in this period the tradition worked to produce compliance and pleasantness. Interestingly, while this created reduced resistance in my practice with pre-service teachers finding their learning experience worthwhile, it could be questioned whether the teaching and learning environment became too pleasant to provoke any change in pre-service teachers' beliefs. This highlights the

power of pre-service teachers but also the way non-tangible forces such as tradition influence practice and relationships. For example, I had the power to provide pre-service teachers with reading materials before lessons and create learning experiences that encouraged them to reflect and discuss teaching and learning. However, pre-service teachers were not interested in reading prior to class or focusing on Sport Education, and hence I struggled to engage in meaningful interaction with the pre-service teachers.

The above sections convey how teaching and learning involves resistance and conformity, success and failures. As such, teaching about teaching (Forgasz, 2013; Ritter, 2011) and learning about teaching (Bullough & Young, 2002) becomes a highly emotional endeavor. For example, my practice provoked pre-service teacher emotions in the beginning of both the university courses. While this developed much resistance to my practice, it further provoked pre-service teachers to reflect on their beliefs about teaching and learning in physical education. Challenging and questioning my practice, I was provoked to reflect on and explain the reasoning behind my teaching.

However, resistance seems productive to a certain extent considering both one's own emotions as a teacher educator and also pre-service teachers' emotions. While resistance can provoke reflection, this thesis illuminate that the emotional cost of resistance is high. For example, the types of feelings of insecurity, ambiguities, tensions, failures and incompetency I experienced in the beginning of the second university course were exhausting and would not have been productive for a long period. Subsequently, I needed to negotiate my preferred direction, while continuously balance between following and challenging pre-service teachers' interest for their learning. Thus, resistance and emotions appear to be important components in the learning process and a precondition for professional development.

Becoming and learning as a teacher (educator)

The literature on beginning teacher educators suggest that they are faced with an "identity shock" (Davey, 2013) and identity change in trying to survive by fitting in and making sense of the multiple demands of teacher education (Boyd & Harris, 2010). While this doctoral study illustrates such experiences, I argue for an alternative ever-evolving understanding of the identity construction of teacher educators. As other researchers (e.g., Hamilton & Pinnegar, 2015; Ovens, Strom, et al., 2016; Strom & Martin, 2017) have argued, this doctoral thesis conveys that teacher (educator)

identity is no fixed phenomenon or a process from novice to expert, but rather an ongoing, dynamic, constantly evolving process produced by an assemblage in which the teacher educator is implicated.

Study I and study III show how I was constantly (re)constructing a professional self in relation to the constellation of elements, forces, and influences occurring in the classroom at any given time. I could become a stressed and insecure teacher educator in one lesson or situation. On other days, or in another situation, when other elements and forces appeared, I might become a calm and confident teacher educator. Nevertheless, in other situations I could become a vulnerable teacher educator.

Study IV further conveyed how small changes in the classroom influenced pre-service teachers' experiences. For example, in one lesson they could describe a student-centered lesson where they allowed students responsibility for their learning, allowing them time to provide feedback. However, in other lessons their teaching could appear as teacher-centered within which they felt a need to be in charge of every aspect of the class.

This shows how the pre-service teachers and I were constantly becoming different as we lived our lives, pursued particular goals, built relationships, and worked with particular people in particular social-cultural-material settings (Ovens, Garbett, et al., 2016). This consideration of teacher (educator) learning as becomings connects with contemporary notions of continuous professional development (Ovens, Garbett, et al., 2016), allowing for a more textured view of the multiple, seemingly contradictory identity enactments, as well as insight into the process of becoming-different over time (Strom & Martin, 2017).

CHAPTER 6: PUTTING ASSEMBLAGE TO WORK: PRACTICAL AND THEORETICAL IMPLICATIONS

This doctoral thesis prompts thinking and understanding about the interactive, relational, and non-directional nature of teacher educator professional development. The process of my professional development involved engaging with and managing multiple actors, components and forces influencing my day to day practice. I present related implications for teacher education below. I begin arguing for a re-conceptualization of the self in teacher educator practice before introducing a potential way in which teacher educators can conceptualize their practice.

Re-conceptualizing the self of teacher educators

This doctoral thesis highlights how both my teacher educator-self and researcher-self became only one of multiple human and non-human elements in a joint construction of practice and understanding. In such a dynamic, relational and interactive practice, I became only one (albeit a leading) actor in my practice. A practice that I characterize as relatively uncontrollable, certainly multidirectional and filled with ambiguities, resistance and tensions.

Subsequently, I argue for a decentered conceptualization of the teacher educator-self that recognizes the limits of individual agency in one's practice and professional development. This conceptualization dissolves both the teacher educator as an autonomous actor that *do* teaching, and the S-STEP researcher from being accused for conducting a study of the self by the self and for the self. The teacher educator becomes one of multiple elements and forces shaping and co-constructing teaching and research practice. Such a decentered conceptualization emphasizes relationality as the central tenet of framing the self in teacher educator practice where attention shifts away from the individual self towards the constitutive nature of the interdependent connections between self and others in the production of, and understanding about, practice (Ovens & Fletcher, 2014).

If teacher educator practice is highly interactive and relational, how should researchers approach such complexity? I argue that rhizomatics and particularly the concept of assemblage provide researchers with one way to study the relational and interactive nature of teacher educator professional development. By conceptualizing and analyzing teacher educator professional development as assemblage, teacher education researchers can better understand the relationships

and interactions inherent in the professional development of teacher educators. I argue that this conceptualization provides a frame for both illustrating the complexity of teacher education, and a language for engaging with, and digging into the complex processes of, professional development.

Subsequently, I encourage researchers to not only state or illustrate that teacher education is complex, but also show how teacher educators engage with, and manage, the complexity of their practice and professional development. In this way the notion of complexity can be more applicable and relevant to teacher education research. For example, thinking with assemblage in this doctoral thesis, I illustrated how multiple elements such as myself, the pre-service teachers, the course tradition, and the Sport Education model shaped and created ambiguities and tensions in my practice. Furthermore, I also attempted to illustrate what the complexity looked like in my practice, i.e., how I continuously engaged with and strived to manage the ambiguity and tensions created by the mixture of elements. I argue that, if the discussion ends by only stating and not showing how people encounter the complexity, the notion of complexity in teacher education can be in danger of becoming only a buzzword, explaining everything and (therefore) nothing.

Teacher educators as "orchestrators"

I argue that such a decentered conceptualization of the teacher educator suggested above posits teacher educators as prominent figures who, although influenced by a variety of elements and forces, are engaged in continuously steering or "orchestrating" practice towards desired outcomes (Jones & Ronglan, 2017; Jones & Wallace, 2005). Below, I introduce and try to develop the notion of orchestration as a means to conceptualize teacher educator practice.

The metaphor of orchestration originally derived from research on complex educational change (Wallace, 2003) and has been further developed as one basis for a more realistic representation of sports coaching (Jones & Wallace, 2005; Jones & Wallace, 2006). The metaphor reflects the belief that many iterative changes within teaching/coaching situations are rather unmanageable, while demonstrating how to cope with such uncontrollability and contradictory influences that is part of the everyday practice (Jones & Wallace, 2005).

While teacher education practice is not exactly the same as sports coaching, the idea that teacher educators are orchestrators does resonate with how both coaches and teacher educators have to operate in their relatively uncontrollable, relational and ambiguous environment. Just as coaches have to make the most of their rather limited agency to achieve their goals with and through

others, so do teacher educators. Subsequently, I suggest that the metaphor of orchestration seems worthy of adaptation as a way of conceptualizing teacher educator practice. By accepting the relational and interactive nature of teacher education, teacher educators can embrace orchestration as a teaching philosophy.

Orchestration implies guiding or steering, as opposed to controlling and smoothly directing, a relational and interactive process (Jones & Wallace, 2006). Rather than being an all-powerful leader that transmits knowledge to pre-service teachers, the teacher educator becomes an orchestrator of learning. The teacher educator initiates the process before reinforcing or moving the process in the preferred direction, without the possibility to predict the exact outcome of their actions. This presents teacher educators' practice as stage managing events, involving continuous decision making related to iterative planning, observation, evaluation, and reactions to contextual "goings on" in the setting (Jones & Wallace, 2006).

The pedagogical notion of "noticing" (Mason, 2002) is a precursor of orchestration (Jones, Bailey, & Thompson, 2013). Teacher educators needs to be able to notice the details of the interactions within the classrooms. For example, communication within the class, facial expressions, comments, or other emotional expressions. Further, teacher educators need to be able to understand such signs. This enables the teacher educator to make adjustments that potentially can lead the process on track and channel the learning in desired directions. Subsequently, orchestration requires observation skills, adaptability, humility, communication skills and an overall view. In this way, teacher educators can intervene to alter or refine conditions in the classroom.

Additionally, being realistic about the relational nature of teacher education implies accepting that it is beyond the agency of teacher educators to eliminate uncertainty and unpredictability from their practice. Although the adoption of orchestration may help to reduce ambiguity, this can only be achieved up to a point. Acknowledging such complexity means acknowledging paradox, and engaging with it as part of a continuous process (Jones & Ronglan, 2017). Thus, teacher educators need to focus on how they can handle, and not eliminate, the resistance, ambiguities and tensions that are inherent in their practice.

I argue that S-STEP can channel teacher educators towards taking more risk and experiment in their practice. This can help teacher educators observe, appreciate, understand and therefore cope with the ambiguities and tensions in their practice. If teacher educators accept the risk of some loss

of control for the sake of innovation, they can potentially better shape their developing understanding of pedagogy (Loughran, 2006).

Teacher educators need to both show the relatively unmanaged character of teaching but also focus on teaching pre-service teachers how to cope with such complexity by encouraging them to live with ambiguity, and so rendering them relatively manageable (Jones & Wallace, 2006). This requires teacher educators to give pre-service teachers access to the uncertainties and dilemmas of practice that is inherent in understanding teaching as complex and problematic. While this is not a particularly original suggestion in teacher education (e.g., Loughran, 2006), a decentered view of the teacher (educator) further highlight the importance of providing pre-service teachers with a realistic picture of the complexity of teaching. Teacher educators need to expose themselves and take a vulnerable position. That is, they need to be explicit about their mistakes, and the dilemmas and emotions that is inherent in teaching.

Finally, I encourage teacher education researchers to engage in rich qualitative studies where they seek to understand the relational and interactive nature of practice. Researchers need to focus on the processes of practice and the ways teacher educators and pre-service teachers' engage with their complex environment. How do teacher educators cope with the ambiguities in their practice? How do they orchestrate both their own and pre-service teachers' learning process? Such research would potentially provide a more sophisticated grasp of the complexities of practice and professional development.

Self-study of teacher education practices as a pedagogy for professional development

This doctoral thesis conveys that developing as a teacher educator is not a detached process that involves a progressive development from insecure to confident, from one level of knowledge to the next. Rather, my professional development was a non-directional process of continuously recognizing, balancing and coping with resistance, ambiguity and tensions that was inherent in my practice. I argue that developing is relational and therefore emotional, it is about recognizing and engaging, and is filled with insecurity and failure in one situation, and confidence and expertise in another situation. Developing as a teacher educator requires personal and genuine involvement in pre-service teachers' learning process, while continuously wrestling with the ambiguity and tensions such engagement brings to the practice.

S-STEP provides a means to study the relational and complex nature of teacher educator practice, and a way to grapple with the ambiguities inherent in practice. By engaging in continuous reflection, focusing on the process of the self in relation to others in practice, and engaging in dialogue with others as a process of understanding, I have shown how S-STEP research can support the individual professional development of teacher educators as well as contribute to the research conversation in teacher education (Hamilton & Pinnegar, 2014).

Contrary to researchers claiming that S-STEP research is not sufficient for truly gaining an understanding of the complex nature of teacher educators' practices (Kosnik, Miyata, Cleovoulou, Fletcher, & Menna, 2015), I argue that S-STEP methodology offers researchers a way to conduct in-depth research of the non-linear and relational nature of teacher educators' identities, practices, backgrounds, transition, challenges, and contexts. While modernist quantitative research studies appear to have the most value in informing teacher educators and policy makers (Cochran-Smith & Villegas, 2015; Cochran-Smith et al., 2015; Kosnik et al., 2015), I argue that this doctoral thesis shows that S-STEP represents a valuable methodology to strengthen teacher education programs. That is, it has the potential to both improve the individual teacher educators' practice as well as the international understanding of teacher education (Hamilton, Pinnegar, & Davey, 2016).

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List of studies

Study I

Hordvik, M., MacPhail, A., & Ronglan, L. T. (2017a). Teaching and learning Sport Education: A self-study exploring the experiences of a teacher educator and pre-service teachers. *Journal of Teaching in Physical Education*, 36(2), 232-243.

Study II

Hordvik, M., MacPhail, A., & Ronglan, L. T. (2017b). Learning to teach Sport Education: Investigating a pre-service teacher's knowledge development. *Sport, Education and Society*. doi:10.1080/13573322.2017.1322948

Study III

Hordvik, M., MacPhail, A., & Ronglan, L. T. (Under review, submitted December 13, 2017). Developing a pedagogy of teacher education using self-study: A rhizomatic examination of negotiating learning and practice. *Journal of Teacher Education.*

Study IV

Hordvik, M., MacPhail, A., & Ronglan, L. T. (Under review, submitted January 3, 2018). Encountering the reality of teaching Sport Education: The experiences of pre-service teachers while on school placement. *Physical Education and Sport Pedagogy.*

Study V

Hordvik, M., MacPhail, A., Tannehill, D., & Ronglan, L. T. (Accepted, September 4, 2017). Decentering the 'self' in self-study of professional practices: A working assemblage. In K. Strom, T. Mills, & A. Ovens (Eds.), *Decentering the researcher-subject in intimate scholarship: Complex, materialist, and posthuman methodological perspectives*: Emerald Books.

Study I

Hordvik, M., MacPhail, A., & Ronglan, L. T. (2017a). Teaching and learning Sport Education: A self-study exploring the experiences of a teacher educator and pre-service teachers. *Journal of Teaching in Physical Education*, 36(2), 232-243.

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Human Kinetics
ARTICLE

Teaching and Learning Sport Education: A Self-Study Exploring the Experiences of a Teacher Educator and Pre-Service Teachers

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Purpose: In this study, we articulate and share our knowledge and understanding of teaching and learning Sport Education in physical education teacher education (PETE): (a) How did the PETE faculty member experience teaching about teaching Sport Education? and (b) How did the PSTs experience learning about teaching Sport Education? **Method:** One PETE faculty member (the first author) and twelve PSTs took part in a university Sport Education unit. Data were collected through the PETE faculty member's open-ended reflective diary and focus groups with three PST teams. **Results:** The PETE faculty member and PSTs experienced various challenges such as bridging theory and practice when learning about teaching Sport Education and articulating the "what", "how" and "why" when teaching about teaching Sport Education. **Conclusion:** Sport Education is a complex curriculum and instructional model, encouraging further interrogation of the theoretical implications of the model.

***Keywords*:** physical education teacher education, signature pedagogies, practitioner research, models-based practice, pedagogy, curriculum and instructional model

Sport Education is a curriculum and instructional model that was developed amid concerns about the lack of authentic, legitimate opportunities for young people to experience sport through physical education (Siedentop, 1994). International research on Sport Education has focused predominantly on preservice teachers' (PSTs'), students' and teachers' experiences of delivering, or being involved in, Sport Education (Hastie, de Ojeda, & Luquin, 2011). Limited research has been conducted in attempting to not only map how physical education teacher education (PETE) faculty members deliver Sport Education in a PETE program but also in capturing the related experience of the PETE faculty member and PSTs.

Research conducted on PSTs learning to teach Sport Education has increased during the last decade. PSTs' occupational socialization attracts them to Sport Education (Stran & Curtner-Smith, 2009) and influences their interpretation and delivery of the model (e.g., Deenihan & MacPhail, 2013; Stran & Curtner-Smith, 2009). In addition, research using the same framework has found that Sport Education is being delivered in one of three ways, relying on the extent to which they incorporate important features of the model (Curtner-Smith, Hastie, & Kinchin, 2008). While teachers using the 'full version' of Sport Education teach all of Siedentop's (Siedentop, Hastie, & van der Mars, 2011) recommendations, in a 'watered down version' and 'cafeteria approach' teachers use parts of the model. Curricular knowledge (understanding the features and structure of Sport Education) has been suggested to be more important than content and pedagogical content knowledge to teach the full version of Sport Education effectively (Stran & Curtner-Smith, 2010).

While PSTs appreciate the cultural and structural advantages of Sport Education (Curtner-Smith & Sofo, 2004), they experience a variety of challenges in learning to teach the model. Previous research has found that PSTs struggled with instruction of tactical development and misunderstood the role of skill development (McCaughtry, Sofo, Rovegno, & Curtner-Smith, 2004). Consequently, a number of the PSTs expressed an uncertainty about adopting Sport Education as teachers, suggesting they would feel overwhelmed with the detailed planning and preparation requirements of the model. Such

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findings resulted in outlining several implications for a PETE faculty member's practice in delivering and supporting PSTs' engagement with Sport Education. Such implications included a need to offer support and teaching suggestions regarding tactical instruction, reinforce the similarities and differences between Sport Education and traditional sport pedagogies, and reteach or reinforce Sport Education frequently during the PSTs' education (McCaughtry et al., 2004). To address these needs, several pedagogical practices have been suggested with respect to how PETE faculty members can effectively teach Sport Education to PSTs. These include having PSTs (i) read, watch, present, reflect and discuss Sport Education, (ii) participate as students in a Sport Education season and (iii) teach Sport Education during school placement or at the university (Curtner-Smith, 2012).

The recommendation of having PSTs "live the curriculum" (Oslin, Collier, & Mitchell, 2001), in which they experience an authentic Sport Education season as learners, has been suggested as the most valued approach in learning to teach Sport Education at the university (e.g., Deenihan & MacPhail, 2013; Jenkins, 2004). To our knowledge, only two studies (Deenihan, MacPhail, & Young, 2011; James, Collier, & Brusseau, 2015) have considered both the PSTs' and PETE faculty member's experience of a Sport Education course. Deenihan et al. (2011) supported PSTs' need to experience an authentic Sport Education season as learners, while recognizing that the PETE faculty member had to make compromises between teaching through the model and, at the same time, teaching PSTs how to teach Sport Education in schools.

From a PETE faculty perspective, Fletcher and Casey (2014) examined their experience of teaching a curriculum and instructional model. Their collaborative self-study revealed the complexity of both teaching about 'how' you teach and at the same time explaining 'why' you do things as you teach. This resulted in a realization that attempting to strike a balance between articulating and modeling the 'hows' and 'whys' of teaching curriculum and instructional models requires significant demands. Such demands include (a) teaching theoretically and practically about the principles of the model, (b) teaching and demonstrating how to teach using the model, and (c) unpacking reasons why you make the pedagogical decisions in situ (Fletcher & Casey, 2014, p. 412). The PETE faculty member in the current study followed this approach to teaching Sport Education. Fletcher and Casey (2014) concluded by requesting more research on PETE faculty members articulating their knowledge and understanding of PETE practice, and sharing how they developed that knowledge. Supporting this call, O'Sullivan (2014), in presenting ideas for a future research agenda for contemporary PETE, suggested self-study designs that analyze communities of PETE faculty members, the individual PETE faculty member, and "signature pedagogies". She encouraged self-study researchers to explore who they are, how well prepared they are, and what signature pedagogies they use, including their effectiveness for specific learning outcomes.

Acknowledging that PETE faculty members need to develop a "synthesis of evidence" in practitioner research (McEvoy, MacPhail, & Heikinaro-Johansson, 2015), a self-study design focuses on PETE faculty member's practices of teaching curriculum and instructional models through the experience of "teaching about teaching and learning about teaching" (Loughran, 2006). As part of a larger self-study project investigating teaching and learning in PETE, the purpose of this study was to articulate and share our knowledge and understanding of teaching and learning Sport Education in PETE. The self-study methodology, together with Shulman's (2005) notion of signature pedagogies, helped us frame the research questions: (a) How did the PETE faculty member experience teaching about teaching Sport Education? and (b) How did the PSTs experience learning about teaching Sport Education? The PETE faculty member in this study is the first author.

Theoretical Framework

Signature Pedagogies

Signature pedagogies are characteristic forms of teaching/learning in a given professional field and are the types of teaching that organize the fundamental ways in which future practitioners are educated for their profession (Shulman, 2005). They define how knowledge is analyzed, criticized, accepted or discarded. We understand signature pedagogies to operate on two levels: an individual level within a course (e.g., a curriculum and instructional model) and a program level enacted by the whole department (e.g., models-based practice). Our unit of analysis was an individual course and the signature pedagogy for that was Sport Education. Shulman (2005) suggested that signature pedagogies share a set of common features that may help explain the relative robustness of these approaches to teaching and learning. First, signature pedagogies are both pervasive and routine, cutting across topics and courses, programs and institutions. Second, they nearly always entail public student performance, forcing PSTs to be both active and interactive. Finally, uncertainty, visibility, and accountability inevitably raise the emotional stakes of the pedagogical encounters (pp. 56–58).

Furthermore, Shulman (2005) suggested signature pedagogies to have three dimensions: (a) surface structure, (b) deep structure, and (c) implicit structure. Signature pedagogies describe teaching and learning in PETE and provide insights into how PETE faculty members come to prepare PSTs for the reality of teaching. In this way it can be used as a framework to examine the experiences of teaching and learning curriculum and instructional models. In the following section, we explain Shulman's (2005) dimensions of a signature pedagogy and provide examples of each of the dimensions of a signature pedagogy by referring to elements of the Sport

Education model. The aim is to expose the reader to a theoretically informed critique of the six Sport Education key characteristics.

Surface Structure

Shulman (2005) argued that signature pedagogies have a surface structure, "which consists of concrete, operational acts of teaching and learning, of showing and demonstrating, of questioning and answering, of interacting and withholding, of approaching and withdrawing" (pp. 54–55). The Sport Education curriculum aims to develop students as competent, literate and enthusiastic sportspeople (Siedentop, 1994). The subject matter in Sport Education is not a range of different sports but sport itself. Siedentop (1994) identified the key characteristics of sport as seasons, affiliation, formal competition, record keeping, culminating event and festivity. Sport Education is a student-centered model that has the potential to provide PSTs with a holistic education (Dyson, Griffin, & Hastie, 2004) through nonnegotiable features in which PSTs experience a number of roles while remaining in the same team throughout the season (Kirk, 2013a). Subsequently, Sport Education's concrete, operational acts of teaching and learning involve the PETE faculty member taking into account several pedagogical considerations: (a) the PETE faculty members is a facilitator, (b) PSTs are active learners, (c) PSTs work in small groups in modified games, (d) learning activities are authentic and developmentally appropriate, (e) learning activities are interesting and challenging, and (f) PSTs are held accountable (Dyson et al., 2004).

Guided practice and independent practice are suggested as concrete instructional strategies of Sport Education (Siedentop et al., 2011). In guided practice, the PETE faculty member introduces new techniques or tactics before teams practice at their home court. PSTs function in other roles (e.g., coach, fitness trainer, referee, or scorekeeper) in addition to their role as a player. This allows, during independent practice, team coaches to lead the practice, facilitated by task cards and teacher supervision. The aim is to show how PSTs themselves experience the development of more responsibility for, and ownership of, their own and future students' learning experience.

Deep Structure

Signature pedagogies have a deep structure, "a set of assumptions about how best to impart a certain body of knowledge and know-how" (Shulman, 2005, p. 55). Sport Education is constructivist in its orientation "through structures that require students to construct knowledge through social interaction" (Rovegno & Dolly, 2006, p. 248). Dyson et al. (2004) described how three tenets of constructivism (Perkins, 1999) allow facilitation of PSTs' knowledge construction. As active learners, PSTs are involved in tasks that stimulate decision making, critical thinking, and problem solving. As social learners, PSTs construct knowledge through social interaction with their peers, facilitated by PETE faculty members. As creative learners, PSTs are guided to discover knowledge and to create their own understanding of the subject matter.

PSTs' learning agenda includes learning about the specific content being taught, learning about learning and learning about teaching (Loughran, 2006). Hence, being successful as a PETE faculty member is not only concerned with having PSTs pay attention to the subject matter being taught but also the practices employed in presenting the subject matter. Russell (1997) terms this the "pedagogical turn". That is, learning what is being taught while at the same time questioning, examining and learning about the way in which it is actually being taught. PETE faculty members need to provide access to the thoughts and actions that shape PSTs' practice and unpack their teaching in ways that allows PSTs "access to the pedagogical reasoning, uncertainties and dilemmas of practice that are inherent in understanding teaching as being problematic" (Loughran, 2006, p. 6).

Implicit Structure

Any signature pedagogy also has an implicit structure, "a moral dimension that comprises a set of beliefs about professional attitudes, values, and dispositions" (Shulman, 2005, p. 55). Kirk (2013a) suggested that Sport Education's philosophy rests primarily on the virtue ethics of MacIntyre (1985) and his concept of social practices. MacIntyre (1985) argues "that social practices, including games and sports, are defined by three main characteristics: standards of excellence, 'goods' that are derived from the pursuit of excellence, and virtues such as honesty, justice and courage that are necessary to achieve these goods" (Kirk, 2013a, pp. 980–981). These values are expressed in Sport Education through the development of a culture of fair play in which participants have respect for others, participate with the right spirit and attitude, value equal opportunity, and behave responsibly (Siedentop et al., 2011).

Methods

Self-study is conceptualized as a methodology centered on the role of the educator within professional practice settings (Ovens & Fletcher, 2014). It is a form of practitioner research that aims to understand and improve teacher educator faculty members' practice through careful examination of one's own learning beliefs, practices, processes, contexts, and relationships (Pinnegar & Hamilton, 2009). Self-study offers the potential for ways of understanding the dynamic of pedagogical practice (Ovens & Fletcher, 2014), facilitating the coupling between teaching and learning (Clarke & Erickson, 2004).

As a guide for our inquiry we sought to incorporate the five key self-study characteristics LaBoskey (2004) suggested: self-studies are self-oriented, focus on improvement, rely heavily on interactivity, use multiple

qualitative methods, and are validated by trustworthiness. A systematic review of the self-study teacher education practices (S-STEP) research literature (Vanassche & Kelchtermans, 2015) identified two tensions common to self-study researchers positioning themselves. These were the tension between rigor and relevance, and the tension between effectiveness and understanding. They believed the tension between relevance and rigor indicates that teacher educator faculty members, from the moment they begin undertaking S-STEP research, need to engage systematically with existing theoretical and conceptual work, while at the same time denoting valuable reflective-descriptive accounts of their experiences. Balancing the tension between effectiveness and understanding encourages teacher educator faculty members to contribute to a broader research agenda while paying attention to one's own personal pedagogy (Vanassche & Kelchtermans, 2015). Teacher educator faculty members managing this tension commit to a practice-based, yet theory-building, research agenda. Throughout this study, the first author aimed to constantly position himself between the tensions of rigor and relevance and the tension between effectiveness and understanding, appreciating that the tensions can never be completely reconciled (Vanassche & Kelchtermans, 2015).

Participants

The participants in this study were one PETE faculty member (the first author) and twelve PSTs (eight females and four males) taking part in a Sport Education unit at a university in Norway. The first author was a 28- year old full time doctoral student with over two years prior experience as a secondary school physical education teacher and 11 years' experience as a junior team handball coach. He had not implemented curriculum and instructional models as a secondary teacher and had to engage in understanding Sport Education's surface, deep, and implicit structure before developing the unit and lesson plans. The former proved an ongoing process while the latter required around 20 consecutive days. Having spent considerable time reading about Sport Education, his knowledge of the model was grounded in theory but not yet in practice.

The PSTs, aged between 19 and 26 years, were in their third semester of a three- year PETE program. While the first year of the PETE program is a general undergraduate education in sport that provides PSTs with a basic academic platform for further studies in sports / physical education, years two and three of the program provide PSTs with PETE-specific pedagogy courses focused on learning "how to teach". There is an absence of curriculum and instructional models in Norwegian physical education (teacher education) practice and research, and consequently the PSTs had experienced a predominantly traditional multiactivity approach to physical education (teacher education) before the Sport Education unit.

The first author identified a "critical friend", a role considered as a core methodological feature of self-study research (Schuck & Russell, 2005). The critical friend is internationally renowned for upskilling PSTs, teachers and PETE faculty members in the area of Sport Education and has contributed extensively to Sport Education research. As the critical friend was based in another country, communication was carried out weekly through e-mail and Skype. The first author was confident the critical friend could ask provocative questions, provide data to be examined through another lens, and offer critique of the first author's work (Costa & Kallick, 1993, p. 50).

Setting

The PSTs took part in a Sport Education unit in team handball taught by the first author. The unit was part of a self-selected five-credit course in which PSTs select three out of five games (team handball, soccer, basketball, floor ball and volleyball). The Sport Education unit consisted of 12 90-minute predominantly practical-based lessons over a five week period (between one and three lessons per week). The Sport Education lesson structure usually contained a 5–15 minute theoretical introduction to a Sport Education feature or theme, a practical Sport Education team handball section in which the first author attempted to articulate the teaching of Sport Education for every lesson through a theoretical introduction, followed by a practical "living the curriculum" start-stop-start approach (interrupting drills explaining the "hows" and "whys" of his teaching actions), and closing the lesson by having each team reflect on the goals of the lesson. This approach forced the first author to constantly change focus between teaching through Sport Education as a school teacher and articulating how and why he was doing things as a PETE faculty member. The Sport Education experience incorporated Siedentop et al.'s (2011) six distinctive features and the structure of the course is outlined in Table 1.

The PSTs collectively selected three team captains, and completed a survey noting their own game playing attributes that subsequently assisted the captains when selecting three mixed ability teams of four PSTs in each. In addition to the role of player, PSTs were required to select peers in their respective teams to undertake the role of head coach, assistant coach, equipment manager, statistician, referee, time- and score-keeper, Facebook chief executive, scout (to gather information about the opponents' strengths and weaknesses), and fair play coordinator. Several of the PSTs had two roles in addition to that of player (e.g., head coach and referee). Each team had their own home court, created a team name ("Team Positive", "Shark Summer" and "The National Team"), selected a team color, made a team poster and had a Facebook page. A progressive competition schedule was implemented with 2 versus 1 and 3 versus 2 games. The duty team took the responsibility for refereeing, timing and scoring, scouting and fair play observation. The culminating event included a presentation ceremony with "team anthems" (selected by the team) and final awards related to team play performance, fair play and duty team responsibility.

Table 1 Structure of the Course

Lesson	Theory	Practical Aspect	Sport Education Aspect
1	Introduction to Sport Education.	Team Handball demo game.	Team and role selection methods.
2	Team affiliation.	Introduction to throw and catch.	Affiliation, teaching roles.
3	Strategies for teaching roles.	Introduction to basic offensive principles.	Equipment organizing, teaching roles.
4	Importance of festivity.	Introduction to basic defensive principles. 2 vs 1 games.	Student-led warm-up (continues and skill practice, teaching roles.
5	Keeping records.	Introduction to shots and block. 2 vs 1 games.	Student-led team practice, teaching roles, practice duty roles.
6	Formal competition.	Mini-tournaments 2 vs 1.	Formal competition, duty team.
7	Assessment.	Transition from defense to offense, 2vs 1 games.	Assessment tools, student-led team practice, teaching roles.
8	Modifying games.	Mini-tournaments 2 vs 1.	Competition day, duty team.
9	None.	Team strategies. 3 vs 2 games.	Team practice.
10	Culminating event.	Mini-tournaments 3 vs 2.	Awards, assessment, duty team.
11	None.	PST Assessment.	Microteaching and written exam.

To consider the extent to which the fidelity of Sport Education was upheld, the first author conducted a systematic observation of videoed lessons (including audio from a microphone attached to the first author) and document analysis of the unit and corresponding lesson plans employing computerized software. Sinelnikov's (2009) 19-point checklist was used to itemize and verify the key processes of Sport Education. Analysis conveyed a near match to the essential elements of Sport Education with modest disparities due to the context being PETE and not physical education which was the focus of the 19-point checklist.

Data Collection

Ethical approval for the study was granted from the Norwegian Social Science Data Services. Data were generated in the Norwegian language through the first author's open-ended reflective diary and focus groups with the three PST teams. The open-ended reflective diary was written regularly as the first author developed the unit and after every Sport Education lesson. A total of 25 entries resulting in 24 pages of text were recorded, with the amount of text for entries varying from a few sentences to almost three pages. Although the reflections were largely open-ended, the post lesson reflections looked to focus on the extent to which the PSTs accomplished the learning goals, PSTs' responses to their learning experience, challenges the first author faced, and adjustments the first author could make for the following lesson or season.

Individual focus groups with the three PST teams were conducted at the university the same week as completion of the Sport Education course. The first author conducted the focus groups in the belief that his experience with the PSTs would allow him to follow up on responses to questions with concrete examples from their shared learning experience. The focus groups ranged between 80 and 115 minutes and followed a semistructured format which granted freedom for the first author and the PSTs to follow relevant and related lines of discussion. The focus groups were aimed at exploring the PSTs' experience of the course and the relationship between their learning processes and learning outcomes. Themes discussed were features of the model, lesson structure and learning experiences, role of the PETE faculty member, and PSTs' view of teaching Sport Education during school placement.

Analysis

A general inductive approach (Thomas, 2006) was employed where our analysis process was guided by the purpose of the research (i.e., the investigation of the first author's and PSTs' experience of the Sport Education unit). Initially, the first author completed and transcribed the focus groups, and discussed his reflective diary with a PETE faculty colleague. Second, the first and second author separately listened to the focus groups and read the reflective diary before sharing reflections on critical incidents, 'aha'-moments and contradictions (Fletcher & Casey, 2014) within and between both data sets. Third, they independently read all components of the data set, and using content analysis and constant comparison (Corbin & Strauss, 2008) identified concepts, categories, and ideas. Fourth, they critiqued and discussed their independently coded data, and identified examples collated into themes (LaBoskey, 2004). This step involved continuing revision and refinement until both found the identified examples and themes meaningful and insightful. Finally, the identified examples were shared with the

third author for further interrogation before agreeing on the final themes.

Trustworthiness in self-study relies on exemplar-based validation (LaBoskey, 2004) and it is the reader that judges if the results and interpretation is sufficiently trustworthy, based on their experience and understanding of practice. Before starting this research, we problematized and discussed the first author's double role as researcher and PETE faculty member. We position the study within a pragmatic social constructivist perspective (Vygotsky, Mead and Dewey), allowing us to consider that the first author and PSTs co-construct knowledge through their own experiences with, and in relation to, their own past histories, culture, social interactions, and emotional responses (Pinnegar & Hamilton, 2009). Aware of the potential power position the first author held and the potential that the PSTs engaged in a "studentship" (Graber, 1991), (i.e., telling the first author what they believed he wanted to hear), the nature of the first author's teaching created an environment where the PSTs could share their lived experience in the focus groups. Furthermore, the first author encouraged the PSTs to share both positive and negative experiences through the focus groups.

Results

Four themes evolved from analysis of the data concerning the related experience of teaching *and* learning about teaching Sport Education: (1) Prerequisite and expectations of course content, (2) The pedagogical complexity of Sport Education, (3) Bridging theory and practice when learning about teaching Sport Education, and (4) Articulating the "what", "how" and "why" when teaching about teaching Sport Education.

Prerequisite and Expectations of Course Content

The first author and the PSTs had to negotiate three related tensions concerning lesson content and structure. While the first author and the PSTs had no former experience with Sport Education or other curriculum and instructional models, a game-based approach to teaching/coaching is achieving modest attention in Norway, and some of the PSTs had experienced such an approach. This approach is also central in other practical courses at the university, though without any explicit connection to theory. Subsequently, the PSTs' exposure to Sport Education was different from any prior (physical education) teacher education experience, and as Caroline explained, "it [Sport Education] is rather distant and I don't really understand it." Adrian admitted that after the first lesson they were asking each other, "What on earth are we doing? What was this?" As for the first author, teaching Sport Education in a new context made him unsure as to the extent to which he was effectively teaching the different dimensions of the model, "Sometimes I think, 'Am I really doing anything of this right?' I have never seen a Sport Education lesson or season in real life... I do not know what works and what does not" (4.12, Sport Education day 7).

The second tension relates to the expectations of course content due to the PSTs' course outline noting that they were to participate in a practical team handball course. As Sofie shared, "I thought I knew what was coming [and I] expected to learn team handball", not expecting the lead author to teach team handball through Sport Education, with Adrian expressing, "I don't feel my knowledge of team handball has developed." The first author was aware of this tension, and after the first lesson he recorded, "[I am] worried how the relationship between Sport Education and team handball will develop. I feel the latter is important. After all, it's team handball that is the name of the course" (18.11, Sport Education day 1). A preference to develop their sport skills and teaching techniques was evident,

> Adrian: I hoped that during the 10 lessons I would get a big bank of drills... I have learned about a new method but I feel that my team handball skills is very similar to what they were ... Sofie: I don't feel that you need to be skilled in team handball to teach it as long as you know the basic skills and to some extent are able to perform them.

The third tension occurred with the exposure of a theory component in a practical course (see Table 1 for themes). The first author started the first lesson with a thorough theoretical introduction to Sport Education's structures, and continued with short specific Sport Education teaching and learning information points at the beginning of each lesson. An awareness of the possible tension this could produce was noted in his diary after the first lesson, "Their expectation was team handball, and suddenly they find themselves pulled into a theory room and presented with something they never heard of" (18.11, Sport Education day 1). Mary explained, "I was like 'ahh' when I saw the projector. I thought, 'Are we having that in a sports hall?' " The PSTs were not used to the expectation of reading before practical lessons nor being challenged to integrate theory and personal experiences through a "living the curriculum" experience.

The Pedagogical Complexity of Sport Education

The first author set out to teach the PSTs: (a) the theoretical foundation of Sport Education and how students learn in the model, (b) how to develop competent, literate and enthusiastic sportspersons, and, (c) strategies for teaching team handball skills and elements of Sport Education. He appreciated that both teaching *and* learning about teaching curriculum and instructional models are identified as challenging and that learning a new teaching approach can be difficult and time consuming.

On the second day of his reflective diary, the first author admitted that it was "difficult and frustrating [not to know] where to start and how to develop the season"

(24.11, Sport Education day 2). Despite the frustrations, and suggestions from the critical friend and the literature to introduce elements of Sport Education one at a time, the first author had a desire to teach a full season believing that such an approach would allow the PSTs to appreciate the model more. It took the first author a considerable amount of time to develop the unit and lesson plans, admitting that he always appeared to be pursuing a tight schedule feeling he was "preparing and preparing, and never get a chance to look at it [the lesson plan] before I use it. There is a lot to understand, and I am not yet feeling confident in the role [as a PETE faculty member]" (26.11, Sport Education day 4).

Regardless of the first author's prior expertise and knowledge of team handball, he experienced delivering the lessons as fully packed and "chaotic" in attempting to teach all the dimensions of Sport Education. Nevertheless, teaching both the Sport Education dimensions and team handball was difficult,

> There is a lot of Sport Education to plan and keep track of... I have rarely used the lesson plan so often to check the next drill. Moreover, I am changing [my teaching] approach [and] it feels like I have to learn to teach Sport Education and a new approach to teaching games at the same time. (24.11, Sport Education day 2)

The PSTs experienced the course as complex and for Tanja it became too difficult, "It was a lot of information, and somehow I have not been able to assimilate everything." The dimensions and various characteristics of Sport Education were difficult to differentiate,

> Tanja: I mixed the concepts. When we were writing the characteristics the first time, we started with something completely different. Jenny: Nobody knew what we were going to write. Tanja: No, it was fair play, began with the roles I think.

The first author's impression in entering the final part of the course was that the PSTs were more involved than before. Kate explained how her engagement and understanding had evolved,

> Kate: Halfway through the course, I had an epiphany... Suddenly I understood the whole thing. First, I thought like, 'Gosh what is this all about?'... I appreciated the purpose but I could not quite comprehend it. However, when we were halfway through the course I felt, 'Yes, this was fun'... You repeated, we went through things over again and drew lines... instead of just, 'Oh we have roles'. Because first I mixed the roles and the characteristics.

Bridging Theory and Practice when Learning About Teaching Sport Education

The Learner Experience. The first author noted half way through the course that the teams were more noticeably beginning to function as teams. This was supported by the PSTs who acknowledged the development of team affiliation throughout the season,

> Mary: I think we developed trust to each other [and] became more confident asking about things... I learned to know them better and what they were able of doing... In the beginning one or two took responsibility and wrote what they already knew, but after a while, all of us became more reflective and could contribute. Tora: You perhaps felt that you had more to offer, because you had developed some kind of expertise that you wanted to share.

The PSTs appreciated "living" the various roles and undertaking the associated responsibility, although the first author did note that the PSTs neglected the role cards that directed them on what each role constituted, preferring to rely on what they already knew about the established roles,

> Adrian: We are not completely familiar with all the details used in Sport Education but we know what the different roles is about, based on our sport experience. Because you have seen and experienced the various roles in different ways, so everyone has some understanding of what they involve.

While the majority of the PSTs concluded that the recent Sport Education experience was sufficient to develop knowledge about their own role, the first author was less convinced that they understood the responsibilities associated with other roles. One team problematized the lack of insight across all roles they acquired when only having had the opportunity to personally experience a few roles,

> Therese: We had tasks that overlapped, you never have time to see what the others did. Especially those that took place during a match... It's impossible for us to see what everyone else does when you actually have a task yourself... You go through it [in your team], but you don't feel as safe as on your own tasks.

Connecting Own Experience With the Theory of Sport Education. Adrian clearly articulated the common PST perspective of the connection between theory and practice,

> Adrian: I believe that theories and methods are more effective to learn in pedagogy. We learn how to teach and how to modify. You have the theory and then practical lessons with that theory. Whereas in the practical sports it's more about developing a bank with different drills with a more direct focus on the sport and not so much on the theory... When you have team handball you expect activity, whereas in pedagogy you expect theory.

Despite conveying criticism of theory being included in practical courses, several of the PSTs learned to appreciate the connection,

> Therese: You are able to connect it [theory and practice] together and that's important for us as prospective teachers ... Michael: I also think it works well, to have some theory and then link it to the practice afterwards... In addition, I think you gradually became better to link it and say, 'Yes, this you can use in this or this way', and you gave us examples related to the theory.

Articulating the "What", "How" and "Why" when Teaching About Teaching Sport Education

Switching Between Roles. The first author admitted to the challenge of constantly changing focus between teaching through Sport Education as a school teacher and articulating how and why he was doing things as a PETE faculty member. He was unsure whether the PSTs were able to recognize and differentiate between the two roles, "[I] keep getting questions about it and should probably be more clear between how they can teach Sport Education and what I do because they are PSTs" (8.12, Sport Education day 8). As the first author attempted to address this, Calvin noticed a progression in his teaching, "I felt you gradually developed and said, 'I would not do this if I was teaching in school. I do this so that you can learn.' " However, several of the PSTs struggled throughout the course to distinguish between what was important for them to learn as teachers (such as learning about team affiliation and Sport Education's instructional strategies), and what would be important for their future students to learn,

> Sophie: We have had a lot of theory because we are going to learn about the model but you could more precisely have articulated how much of the theory we should teach [to students] and how much is for us [as PSTs]. Caroline: I feel a bit the same. It's of course because we are going to learn why it's important, but should I focus on telling them it's important that you have a good atmosphere in the team or cheer because it's important to have good affiliation?

Considering the PSTs' needs and concerns in the penultimate day of the season, the first author delivered an authentic Sport Education day as he would have done as a physical education teacher. After the lesson he reflected on the experience, "The problem when they [PSTs] are working with Sport Education and participate [as students] in a curriculum is that they do not understand the reasoning behind the teaching" (10.12, Sport Education day 9).

Unpack Teaching. Aware of the new teaching context (i.e., PETE rather than school physical education), the first author reflected on what the PSTs were likely to be curious about with regard to teaching Sport Education. All the learning outcomes of the lessons were shared with the PSTs and focused on improving their understanding of teaching and learning in Sport Education, e.g., "PSTs will learn why and how to build teams affiliation in a Sport Education season" (24.11, Sport Education day 2).

Despite the considerable awareness of possible challenges he might encounter, the first author found it difficult to articulate the "hows" and "whys" of Sport Education. After the first lesson he noted, "I could have explained the meaning of the role cards better, why it is used and why it is important for students" (18.11, Sport Education day 1). Thinking about the "hows" and "whys" became something that he was always conscious of and some of the PSTs clearly understood the reasoning behind his Sport Education practice,

> Elias: Like you have done with the task cards, explained why you did like this, why you have task cards. You mentioned several times that task cards are useful for children because it displays what to do and what they should focus on. Then we realize why you did it and how it can be used.

In elaborating on the "hows" and "whys" of Sport Education, PETE faculty members need to provide insights into the reality of teaching. Apart from a limited discussion of the difference between teaching Sport Education at the university and during school physical education, the first author and the PSTs refrained from reflecting on teaching in school. The first author only once noted the unpredictability of teaching, "[Today,] it was fewer [PSTs] present than expected, and that was a challenge. Could have mentioned to the PSTs that this is a frequent occurrence for the [school] teacher. You always have to adjust the plan" (26.11, Sport Education day 4).

Discussion

Acknowledging that we need to develop a synthesis of evidence in practitioner research (McEvoy et al., 2015), the purpose of our paper was to articulate and share our knowledge and understanding of teaching and learning Sport Education in PETE, exploring (a) How the PETE faculty member experienced teaching about teaching Sport Education? and (b) How the PSTs experienced learning about teaching Sport Education?

The relationship between teaching and learning was complicated in this study due to the first author and the PSTs having no former experience with Sport Education or other curriculum and instructional models, and the PSTs' expectation that they were to exclusively develop content knowledge through a predominantly practical experience. Previous research has explored Norwegian PETE faculty members' and PTSs' notion of teaching and learning within PETE (Mordal-Moen & Green, 2014a, 2014b). Not dissimilar to other studies Mordal-Moen & Green (2014a, 2014b) suggested that Norwegian PETE programs tend to confirm rather than challenge PSTs'

beliefs about physical education, while PSTs value their experience as "the most important, most legitimate 'evidence' on which to base their beliefs and practices ... [expressing] resistant to the 'theory' of teacher education" (Mordal-Moen & Green, 2014b, p. 806). Furthermore, PSTs view the primary function of PETE to develop their sport skills and teaching techniques. In our study, the PSTs expected to become performers of team handball while taking on a " 'hunter-gatherer' approach to accumulating teaching procedures" (Loughran, 2006, p. 45) requesting "tips and trick" of teaching. However, the first author challenged their pre- socialization and beliefs about teaching sports in physical education by teaching team handball through Sport Education. Sport Education provided the first author and the PSTs with an entirely new experience of teaching and learning in (physical education) teacher education, representing a "radical reform" (Kirk, 2010) for both. The combination of Sport Education and team handball forced the first author to "re-learn" teaching the content (Gubacs-Collins, 2007), while at the same time deliver the characteristics of Sport Education. This made him uncertain and frustrated, at times feeling incompetent to teach all the various Sport Education features. However, he also experienced enjoyment and satisfaction when developing Sport Education in practice. These contrasting experiences and feelings are similar to that of newly qualified teachers (Deenihan & MacPhail, 2013) and prompt us toward the crucial aspect of teacher educator faculty members sharing their own feelings with PSTs (Loughran, 2006).

This study supports the importance of PETE programs providing PSTs with an opportunity to "live the curriculum" (Deenihan & MacPhail, 2013; Deenihan et al., 2011; Oslin et al., 2001), in which PSTs construct knowledge through their experience, enabling them to understand theory in practice and theory through practice (Rovegno, 2003). However, teaching *and* learning about teaching involves more than focusing on the subject matter being taught. The PETE faculty member and PSTs need, at the same time, to pay attention to the manner in which that knowledge is being taught (Loughran, 2006). PETE faculty members "need to be able to theorize practice in such a way as to know and be able to articulate the what, how and why of teaching and to do so through the very experience of teaching *and* learning about teaching" (Loughran, 2006, p. 14). The first author was aware that he needed to strive to reach a balance between teaching through Sport Education and, at the same time, teaching PSTs how to teach the model in schools (Deenihan et al., 2011). However, he experienced this as challenging as he had no prior experience of articulating his own practice through prior teaching/coaching experiences. Acknowledging that articulating the "hows" and "whys" require different types of knowledge (Fletcher & Casey, 2014), the first author experienced difficulty in allowing PSTs to "see into practice" (Nicol, 1997). Due to the constant switches between the PSTs being encouraged to learn about Sport Education and learn about teaching Sport Education, they struggled at times to identify accurately with the respective roles. Consequently, some of the PSTs believed that students need to learn about Sport Education (e.g., teaching students' theoretically about affiliation).

Such experiences heightens the importance of PETE faculty members being explicit about their teaching actions, focusing on the learning of a curriculum and instructional model and/or teaching actions associated with learning to teach a model. Through the first author's self-study, we have come to acknowledge that PSTs, in a PETE Sport Education unit, need to be encouraged to discuss and reflect upon the "hows" and "whys" of teaching curriculum and instructional models. PETE faculty members can facilitate PSTs' learning by providing them with: (i) learning outcomes that focus on the how and why of teaching, (ii) course work in which PSTs need to reflect and discuss the different dimensions of the model while actually designing (and perhaps implementing) a Sport Education season, and (iii) teachable moments, explaining the how and why of practice in situ.

The first author learned that implementing a curriculum and instructional model requires an "extensive commitment of time, energy, and emotion" (Fletcher & Casey, 2014, p. 416). The complexity of Sport Education served as the main challenge for the first author and the PSTs. While PSTs appreciate the structural advantages of Sport Education (Curtner-Smith & Sofo, 2004), the findings of our study convey that teaching *and* learning about teaching Sport Education involves more than learning how to organizing a season and facilitate school student learning. A curriculum and instructional model comprises learning, curriculum (subject matter) and instruction (teaching strategies) (Kirk, 2013b). Hence, in teaching Sport Education, PETE faculty members require knowledge of, and the skills to develop and implement, multiple features of the model: (i) key characteristics and features (e.g., goals, affiliation, festivity, formal competition); (ii) curriculum and instructional strategies (e.g., guided and independent practice); (iii) class management procedures (e.g., fair play strategies); (iv) modify games and activities, and; (v) authentic assessment tools (Siedentop et al., 2011). The first author's desire to maintain the fidelity of the Sport Education model resulted in not only increasing the complexity of delivering the model but also in experiencing an overwhelming pressure in planning and preparing for the course. Moreover, the scope of Sport Education influenced the PSTs experience as they struggled to understand and differentiate between the various elements of teaching and learning within the model. The challenges and difficulties the first author and the PSTs encountered support earlier recommendations to introduce components and content of Sport Education gradually considering, "the teacher's confidence delivering Sport Education, students' readiness for the model and the school context in which the model is to be delivered" (Deenihan & MacPhail, 2013, p. 182).

Using Shulman's (2005) notion of surface, deep and implicit structure of signature pedagogies to frame the study, we aimed to expose the reader to a theoretically informed critique of the six Sport Education key

characteristics. The results in this study enhance the complexity of Sport Education conveying the various challenges of both teaching and learning. Researchers have identified subject matter knowledge and pedagogical knowledge pitfalls that teachers encounter when learning to teach Sport Education (Deenihan & MacPhail, 2013; McCaughtry et al., 2004). Contrary to Stran and Curtner-Smith (2009), we support researchers (Glotova & Hastie, 2014) stating that teachers who are teaching through Sport Education need both content and pedagogical content knowledge (Shulman, 1986) to understand and deliver the model with respect to students' needs. In future studies, we encourage researchers to use a theoretical lens examining the complexity of teaching Sport Education rather than focusing solely on the delivery of the six key characteristics.

This study conveys that Sport Education is a curriculum and instructional model lacking a thorough exploration that can establish an even more robust and sophisticated model. Appreciating the research conducted on Sport Education, we find the majority to favor a surface investigation relying on the six key characteristics of the model, stating the extent to which school teachers, PSTs or PETE faculty members are delivering Sport Education properly if they execute the characteristics (e.g., "full version", "watered down version" or "cafeteria approach"—Curtner-Smith et al., 2008). The experiences of the first author and PSTs conveyed that Sport Education is a complex curriculum and instructional model, encouraging further investigation of the theoretical implications of the model.

We have offered insights into the reality of PETE with special attention on the *who* (Kelchtermans, 2009), addressed as the missing gap in research on curriculum and instructional models (Fletcher & Casey, 2014). We used self-study methodology and the notion of signature pedagogies to examine the interdependent worlds of teaching about teaching and learning about teaching, allowing alternative perspectives on the intentions and outcomes of the Sport Education unit (Loughran, 2006). The diverse experiences in this study convey the various tensions inherent in PETE, emphasizing the inclusion of the PSTs' voice as regards experience and perspectives.

We have expanded on the work of Fletcher and Casey (2014) and hope the study encourages others in the PETE community to adopt the self-study methodology as a means to examine the relationship between teaching and learning curriculum and instructional models. We suggest two implications that can further strengthen and extend S-STEP research. First, self-study scholars be encouraged to use video and audio of their lessons as a means to (i) continuously reflect (in collaboration with a critical friend) on their teaching practice, (ii) gather data that can advance the production of knowledge about teaching and learning, and (iii) establish study trustworthiness (e.g., by verifying the accuracy of entries in the reflective diary). Second, there is a need for longitudinal self-studies where PETE faculty members constantly build on what they have learned from prior stages of their study. Dependent on the study design, there is an opportunity for PETE faculty to continually learn from and review teaching and learning experiences while, at the same time, considering the PSTs needs and concerns.

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Study II

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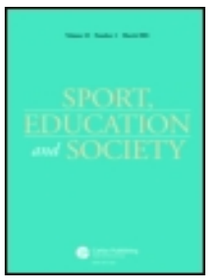

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Learning to teach sport education: investigating a pre-service teacher's knowledge development

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ABSTRACT

The pre-service teacher (PST) learning process has been claimed to include multiple and complex forms of learning because various areas of knowledge growth occur at the same time. In the Sport Education (SE) literature, there has been a noticeable dearth of research regarding how PSTs learn, interpret and deliver the model. While several studies report PSTs having experienced SE prior to the formal study being carried out, to our knowledge, only one study has followed PSTs through a series of learning experiences. In this study, we used the three-level model of learning as a framework to investigate a PST's continuing process of learning to teach SE as part of a PETE program and while teaching during the school placement component of the PETE program. The study was guided by the question, 'How does a PST's knowledge of teaching and learning SE develop?' This study reports on one physical education PST learning to teach SE. The learning experience was composed of four PETE courses (two content courses and two school placements) divided into five phases. Data collection employed five semi-structured interviews, coursework and a focus group. Data were analyzed using a hybrid approach of inductive and deductive theme development. Results revealed that the PST progressively developed conscious awareness and understanding about teaching and learning SE. The comprehensive learning experience made the PST develop understanding of teaching and learning SE that reflected knowledge on an abstract level. Studying the relationships between SE concepts, while connecting them with knowledge from various PETE courses, the theoretical foundation of SE became accessible. We encourage physical education teacher educators to allow for a continuing growth of understanding where PSTs develop knowledge through various SE learning and teaching experiences tailored around their needs and concerns.

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Introduction

General education (Cochran-Smith, 2005), as well as physical education teacher education (PETE) (McEvoy, MacPhail, & Heikinaro-Johansson, 2015), researchers urge us to contribute to a broader research agenda by developing a 'chain of evidence' that strengthens the link between teacher education programs, pre-service teachers' (PSTs') learning, PSTs' delivery during school placement and as a beginning teacher, and the subsequent effect on the learning experiences of students. This study can be envisaged as contributing to the 'chain of evidence' concerned with empirical evidence demonstrating the link between teacher education programs and PSTs' learning (Cochran-Smith,

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2005). That is, this study investigates a physical education PST's continuing knowledge development of teaching and learning in Sport Education (SE) (Siedentop, 1994; Siedentop, Hastie, & Van Der Mars, 2011).

The PST learning process has been claimed to include multiple and complex forms of learning because various areas of knowledge growth occur at the same time (Calderhead, 1991). Becoming a teacher encompasses an intertwined process between the inward journey of self-as-teacher and the outward conceptions of teaching, that together form complex developmental trajectories of learning to teach (Lee & Schallert, 2016). The aim of this case study is to understand the process involved in a PST's development of SE teacher knowledge.

The three-level model of professional learning (Korthagen & Lagerwerf, 1996) is advocated as a framework of professional learning that can further develop the body of knowledge in the field of teaching and teacher education by linking the experience to the thinking and learning process of teachers (Korthagen, Kessels, Koster, Lagerwerf, & Wubbels, 2001). Expanding on empirical data from teacher learning and brain research, Korthagen (2010) concluded that the model reconciles the situated learning perspective (the role of embodied social learning) with traditional cognitive theory (the characteristics of knowledge and knowledge development). In the present study, we use the three-level model as a framework to investigate a PST's continuing process of learning to teach SE as part of a PETE program and while teaching during the school placement component of the PETE program. The study was guided by the question, 'How does a PST's knowledge of teaching and learning SE develop?'

Sport education

SE is a curriculum and instructional model that was developed amid concerns about the lack of authentic, legitimate opportunities for students to experience sport through physical education (Siedentop, 1994; Siedentop et al., 2011). It is a student-centered model based on constructivist learning theory where students are required to construct knowledge through social interaction with their peers (Dyson, Griffin, & Hastie, 2004). This means that students are involved in tasks that stimulate decision making, critical thinking, and problem solving while being guided by the teacher to discover knowledge and to create their own understanding of the subject matter. SE's long term learning objectives are to develop students as competent, literate, and enthusiastic sportspersons (Siedentop, 1994). The subject matter in SE is not a range of different sports but sport itself, in which Siedentop (1994) identified the key characteristics as seasons, affiliation, formal competition, record keeping, culminating event and festivity. Students are held accountable by remaining in the same team throughout the season while experiencing a number of roles (e.g. coach, referee, journalist) in addition to that of a player.

Learning to teach sport education

There has been a noticeable dearth of research regarding how PSTs learn, interpret and deliver SE (Stran & Curtner-Smith, 2009). While PSTs appreciate SE's cultural and structural advantages (Curtner-Smith & Sofo, 2004; Stran & Curtner-Smith, 2009) and experience being a facilitator of practice (Deenihan & MacPhail, 2013), they initially misunderstand SE and experience increased workload requirements teaching it (McCaughtry, Sofo, Rovegno, & Curtner-Smith, 2004). While several studies report PSTs having experienced SE prior to the formal study being carried out (e.g. Deenihan & MacPhail, 2013; Stran & Curtner-Smith, 2010), to our knowledge, only one study (Glotova & Hastie, 2014) has followed PSTs through a series of learning experiences. In the study of Glotova and Hastie (2014), the PSTs' learning experience included four courses, respectively involving PSTs taking part in a theoretical course, being assistant teachers in a university course, planning a teaching period, and teaching in school physical education. Not unexpectedly, as both learning to teach (Calderhead, 1991) and SE (Hordvik, MacPhail, & Ronglan, 2017) is considered a complex endeavor,

findings conveyed that deep understanding of teaching SE requires an extended learning experience (Glotova & Hastie, 2014). The challenge that remains is to use a theoretical lens examining the interconnection of content, process and contexts in learning to teach SE (Hordvik et al., 2017).

Three-level model of learning

The three-level model of learning (Korthagen & Lagerwerf, 1996) illustrates levels in PSTs' professional learning (Figure 1). It emphasizes the need to create suitable experiences and the influence of feelings and personal needs in learning about teaching (Korthagen et al., 2001). The three-level model is the theoretical foundation of the pedagogy of 'realistic teacher education' that builds on concrete experiences, and the concerns and gestalts (personal accumulations of needs, concerns, values, meanings, preferences, feelings, and behavioral tendencies) provoked by these situations (Korthagen et al., 2001). Given our focus on a PST's SE knowledge development, we believe the three-level model of learning allows us to investigate the development of knowledge about teaching and learning SE, with special attention to the gradual growth within a single level and the transitions from one level to another.

The gestalt level

The gestalt level is rooted in practical experiences, and is often unconscious. It encompasses the whole of the PST's perception of the here-and-now situation and displays the relationship between experiences and internal processes in the PST, acknowledging that the cognitive, affective, motivational and behavioral aspects of human functioning are interrelated (Korthagen, 2010). The implicit learning taking place during the process of gestalt formation is characterized by the 'development of awareness' (Marton & Booth, 1997). This concept strongly emphasizes the role of perception in learning in which the PST, after an intended learning process, has 'become capable of discerning aspects of the phenomenon other than those she had been capable of discerning before' (Marton & Booth, 1997, p. 142). Referring to the work of Lave and Wenger (1991), Korthagen (2010) emphasizes the situated learning experience in the gestalt formation process and notes a need to balance the experience between being fully contextualized (e.g. teaching in school before having learned about teaching) and fully decontextualized (e.g. learning about teaching solely through theory). A PST will gradually develop abstract gestalts through suitable learning experiences, resulting in 'desituating' of knowledge that allows for a transition from the gestalt to the schema level (Korthagen, 2010).

The schema level

The schema level develops through reflection on the gestalt level in which the PST may develop a 'personal practical theory' (Korthagen, 2011). This is an important next level in the learning

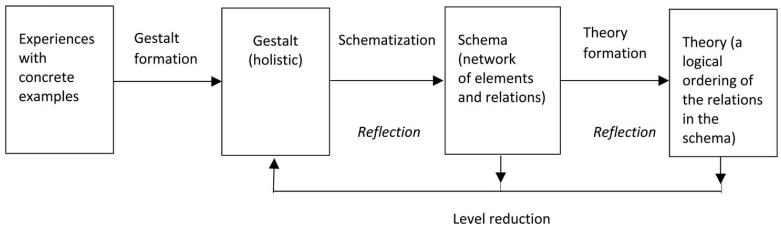

Figure 1. The three-level model and the accompanying learning processes (retrieved from Korthagen et al., 2001, p. 191).

process and, while the gestalt level shows that many of the sources of a PST's behavior may remain unconscious, (s)he may become consciously aware of at least some of these sources (Korthagen, 2010). When the PST reflects on a situation and related actions, (s)he may develop a conscious schema of concepts, characteristics, and principles that is helpful in describing practice (Korthagen, 2010). The schema level is grounded in concrete situations, e.g. when students ask the PST how the role (e.g. head coach) in a SE season should be performed, the PST provides students with the correct 'answer'. Afterwards (within or after the lesson) the PST reflects on the situation, acknowledging that instead of giving the answer, students should be encouraged to consider their role card and discuss the various responsibilities before experiencing the role. In this situation, the PST uses or develops a schema in which the concepts of 'questions' and 'valuable feedback' become connected, and a pedagogical principle develops where the PST considers how to best stimulate students to use their teammates.

The theory level

The development of an abstract understanding of particular situations leads the PST to the theory level. This level aims to develop 'deep and generalized understanding of a variety of similar situations (…) [where] a logical ordering is constructed in the knowledge formed before: the relationships within one's schema are studied or several schemata are connected into one coherent 'theory'' (Korthagen, 2010, p. 102). Transition to the theory level is possible only when a PST has developed rich schema and the desire to develop a more theoretical understanding of a range of similar situations (Korthagen, 2010). Practitioners, however, do not often reach the theory level because they focus on directions for taking actions in a particular situation and have a desire to know how to act (Korthagen, 2010). Using the same example of the PST providing feedback to students, if the PST has reached the theory level, (s)he understands how students learn their role based on schema(s) related to social constructivism. This helps the PST to understand students' learning processes in general and on an abstract level.

Level reduction

The schematized and theoretical knowledge can become self-evident when the two levels are used in a less conscious way, as if the schema or theory have been reduced to one gestalt (Korthagen, 2010). This involves sufficient practical experiences that are carefully organized and structured with respect to the PST's needs and concerns. Again, when students ask the PST how they should perform their role, (s)he is aware of the importance of creating experiences for students and promoting collaboration. In teacher education, the PST develops a conscious schema about teaching and learning where notions such as 'experience' and 'collaboration' play a central role. Having taught over a period based on this schema, the PST reacts 'automatically' and asks the students how the team can develop knowledge about the roles. This 'level reduction' allows PSTs to concentrate on other things in which the relevant schema or theory needs less attention during one's actions (Korthagen, 2010).

Objective and purpose of the study

There is a need for longitudinal research studies reporting how PSTs learn, interpret and deliver SE. Moreover, Korthagen et al. (2001) asked for more empirical support and more elaboration of the relations within and across the levels in the three-level model of professional learning. Examining the interconnection of content, process and contexts using the three-level model as a framework has significant implications for understanding teaching and teacher education, and, specifically, the knowledge development of teaching and learning SE. The objective of this study was to investigate a physical education PST's continuing process of learning to teach SE as part of a PETE program

and during the school placement component of the PETE program. The study was guided by the question, 'How does a PST's knowledge of teaching and learning SE develop?'

Method

Context and participant

In Norway, the overall aim of all three year teacher education programs is to educate PSTs with core professional knowledge within five areas; academic competence, didactic competence, social competence, developmental competence, and competence in professional ethics (KD, 2003). While the first year of the particular PETE program is a general undergraduate education in sport that provides PSTs with a basic academic platform for further studies in sports / physical education, years two and three of the program provides PSTs with PETE-specific pedagogy courses focused on learning 'how to teach'. The PETE program as a whole is professional, with a fluctuation between theoretical and practical courses (combination of compulsory and optional) and two six-week school placements, each divided into two periods of teaching within the same school.

Purposive sampling was used to select Mateo (age 23 at graduation from the program) who was in his final four semesters of the three-year undergraduate PETE program. Mateo was selected based on his consistency of engagement throughout the study (a consequence of the optional nature of the different content courses). He had graduated from upper secondary school one year prior to entering the PETE program. Not dissimilar to other PSTs (Evans & Williams, 1989; Macdonald, Kirk, & Braiuka, 1999), Mateo shared that he had entered PETE because of an early love of sport. However, he also had a passion to see and help children develop, and working with young people to achieve something together.

The pre-service teacher's learning experience

Mateo's specific learning experience was composed of four PETE courses (two content courses and two school placements) divided into five phases. These five phases are denoted in Table 1.

While phase 1 and 2 were carried out during the second academic year, phases 3–5 were carried out in the third (final) year of the PETE program. The total workload for Mateo was 66 h of attending PETE classes, 80 h total teaching during school placements and an expectation of approximately 200 h in completing individual and group work in addition to scheduled class time. The 80 h teaching complement during school placements was broken down into 11 h of teaching SE. The structure of the five SE units are outlined in Table 2 (content courses) and Table 3 (school placements).

Phase one: self-selected team handball course

The team handball course was part of a self-selected five-credit module in which PSTs select three of five games (team handball, soccer, basketball, floor ball and volleyball). Twelve PSTs participated in the SE unit that consisted of ten 90-minute predominantly practical-based lessons over a five week period. Mateo was learning about teaching SE through a theoretical introduction to a SE element, followed by a practical 'living the curriculum' (Oslin, Collier, & Mitchell, 2001) (i.e. PSTs experience

Table 1. Mateo's sport education learning trajectory.

Phase	Course	Period/length
Second academic year		
1	Self-selected team handball course	5 weeks (10 lessons)
2	School placement in lower secondary school	4 weeks
Third academic year		
3	Self-selected games course (First period)	7 weeks (13 lessons)
4	School placement in upper secondary school	Two 3 week periods
5	Self-selected games course (Second period)	5 weeks (10 lessons)

Table 2. Structure of Mateo's SE-PETE courses (Phase 1, 3 and 5).

	Phase 1 Team handball course	Phase 3 Games course (first period)	Phase 5 Games course (second period)
1	Team Handball demo game. Team and role selection. SE features.	SE features and team selection (Lecture).	Net games. Similarities, transfer and game modification.
2	Throw and catch. Affiliation, teaching roles.	Touch rules and demo game. Team routines.	Kin-ball skills. Team and role selection
3	Basic offensive principles. Teaching roles.	Tactics and skills. Teaching roles.	Kin-ball skills and tactics. Role selection.
4	Basic defensive principles. Teaching roles.	Small-sided games (2vs1). Duty team.	Pickleball skills and tactics. Curriculum strategies.
5	Shots and block. Teaching roles.	Preseason games (3vs2). Roles and duty team.	Pickleball skills and tactics. Instructional strategies.
6	Mini-tournaments 2 vs 1. Competition, duty team.	Preseason games (3vs2). Roles and duty team.	Invasion games. Similarities, transfer and game modification.
7	Transition - defence to offense. Assessment tools.	Mini-tournaments 3 vs 2. Competition, duty team.	Korfball skills and tactics. Class management.
8	Mini-tournaments 2 vs 1. Competition day, duty team.	Team handball demo game. Teaching roles.	Korfball skills and tactics. Competition.
9	Team strategies. Team practice.	Small-sided games (2vs1). Teaching roles.	Ultimate skills and tactics. Game play assessment.
10	Culminating event 3 vs 2. Awards, assessment.	Preseason games (2vs1). Roles and duty team.	Ultimate skills and tactics. Game play assessment.
11	PST Assessment. Microteaching, written exam.	Mini-tournaments 2vs1. Competition, duty team.	
12		Preseason games (3vs2). Roles and duty team.	
13		Culminating event 3 vs 2. Roles, duty team, awards.	

a SE season similar to how the model would be delivered in a school context) start-stop-start approach (i.e. the teacher educator interrupting drills explaining how he was teaching and at the same time explaining why he did things in situ), and closing the lesson with a team reflection on the goals of the lesson. Mateo's group coursework included a description of the SE model, a reflection on how to teach affiliation and roles in school, and which aspects of the SE unit he thought had been easy/difficult to understand. Mateo was assessed through a written exam and not his submitted coursework.

Phase two: school placement lower secondary school

Mateo was placed in a lower secondary school that catered for approximately 450 students. The school had a sports hall including two full size team handball courts, two beach volleyball courts, an all-weather basketball court and opportunities to use the nearby forest. The school had twelve

Table 3. Structure of Mateo's SE school placement teaching (Phase 2 and 4).

	Phase 2	Phase 4
1	Expired due to an arrangement in another subject.	Introduction to SE. Team and role selection. Team affiliation. Teacher instruction.
2	Team selection, team affiliation, and student led warm up and team practice (task cards).	Student led warm up and team practice (task cards)
3	Student led warm-up and team practice (task cards), team organizing equipment	Competition day, duty team responsibility
4	Expired due to a class trip.	Repeating SE features and routines Floor ball tactics. Teacher instruction
5		Student led warm up and team practice (task cards). Teaching duty team roles.
6		Competition day, duty team responsibility.

full-time physical education teachers and a female physical education teacher was assigned as Mateo's cooperating teacher. Mateo's coursework included lesson plans and a reflective diary related to his experience of teaching SE.

The school placement was a four-week period carried out in Mateo's fourth semester of the PETE program, five weeks after completion of the team handball course. Because of unpredicted events, Mateo only taught two (not four as planned) 60-minute SE lessons in team handball to 29 students (14 girls and 15 boys aged between fourteen and fifteen years). He started the first lesson by selecting six teams (all teams were mixed as regards gender and race). The student teams created a team name and team cheer, and were provided with their own home court and team color matched to the color of school vests. While deciding not to define and use permanent roles (in agreement with the teacher educator), Mateo used task cards for independent practice, allowing teams to pick students to undertake the role of fitness trainer (leads team warm-up) and coach (leads team practice). The students collectively helped organize the team equipment.

Phase three: first period of a self-selected games course

Twenty-one PSTs participated in the games course that was a self-selected seven-credit module in which PSTs select one of three activities to specialize in (games, outdoor education or alternative movement activity). The first period of the SE unit consisted of thirteen 90-minute predominantly practical-based lessons over a seven week period. Mateo was learning about teaching touch rugby and team handball using SE through a 'living the curriculum' experience and closing the lesson with a team reflection on the 'how' and 'why' of teaching. This encouraged Mateo to be constantly constructively critical towards teaching and learning SE. Mateo's group coursework contained the development of a comprehensive SE season design.

Phase four: school placement upper secondary school

Mateo was placed in an upper secondary school that catered for approximately 800 students. While having two divided gymnasiums, one the size of a basketball court and the other the size of two volleyball courts, the school was located in a densely populated area with limited opportunity for outdoor activities. The school had six full-time physical education teachers and a male physical education teacher was assigned as Mateo's cooperating teacher. Mateo's coursework included his teaching philosophy, lesson plans and a reflective diary related to his experience of teaching SE.

The upper secondary school placement was composed of two three-week periods in the fifth and sixth semester of the PETE program. The first period was carried out two weeks after completion of the games course, with a ten week period between the two placements. Mateo taught six 90-minute floorball SE lessons to 30 students (16 girls and 14 boys aged between sixteen and seventeen years). The student teams had their own home court, created a team name, and selected a team color matched to the color of school vests. In terms of team and role selection, Mateo's cooperating teacher selected three mixed ability teams. The selection was based on gender, race and the cooperating teacher's perception of student skills. In addition to the role of player, Mateo required students to select peers in their respective teams to undertake the role of captain, manager, head coach, referee, time- and scorekeeper, statistician and event coordinator. Mateo used task cards to facilitate team warm up and practice, and provided the time- and score-keepers and statisticians with specific game task cards.

Phase five: second period of a self-selected games course

The last period of the games course was a SE unit consisted of ten 90-minute predominantly practical-based lessons over a five week period. While Mateo's first two content courses (phase 1 and 3) had concentrated on learning 'how' to teach the various SE features, this period focused on how various net and invasion games can be delivered through SE and how teachers can adjust and modify the model with respect to both students' and teachers' needs. The focus had shifted from foregrounding SE to how various games could be used in the model. The lesson structure usually included a practical section with techniques and tactics related to the game while enacting SE aspects (e.g. team lead

warm up and practice), and ending with a team and/or class discussion on how to teach a specific SE element that usually had been used within the specific lesson (e.g. instructional strategies and assessment). Mateo's group coursework contained a SE season design, practical presentation of related SE aspects and final reflection/discussion with the teacher educator.

Data collection

Ethical approval for the study was granted from the Norwegian Social Science Data Services and Mateo signed a consent form. Several data collection procedures were completed to explore the research questions and included semi-structured interviews (Bryman, 2012) with Mateo, his individual coursework (including his interpretation of SE, teaching philosophy, unit and lesson plans and reflective diaries) and a PST focus group (Kitzinger, 1994). Figure 2 illustrates the data collection points. One focus group and five in-depth interviews were carried out during the four semesters: (i) end of the team handball course and prior to school placement (focus group); (ii) end of school placement; (iii) end of the first period of the games course and prior to school placement; (iv) in between school placement; (v), end of school placement; and (vi) end of the second period of the games course. The aim was to document Mateo's continuing experience and ongoing knowledge development of teaching and learning SE. His coursework was collected after the first SE unit and on completion of the two school placements, with the aim of documenting the intended and subsequent teaching experience, and allowing Mateo to present a more considered interpretation of SE (compared to relying solely on answering questions in the interviews).

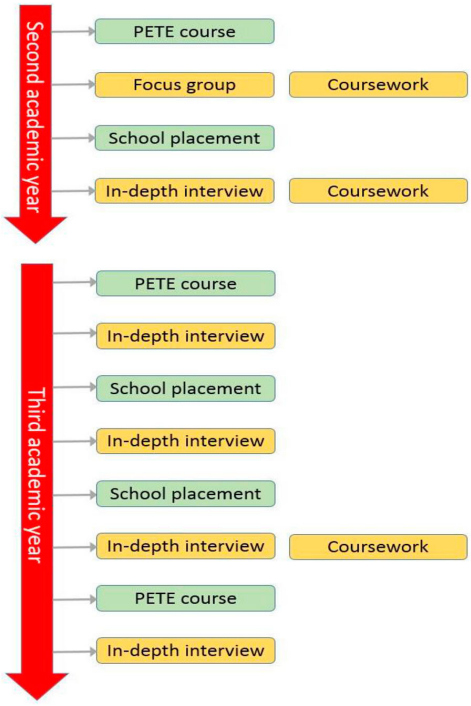

Figure 2. Data points.

Importantly, Mateo was in no way penalized or advantaged for expressing his experience of teaching and learning SE or by having his coursework used as a data source for the study. We also recognize the possibility that Mateo expressed himself in part to please the teacher educator (first author). However, his experience of learning about, and teaching, SE included experiences of satisfaction and success, but also resistance, struggles and failures. Mateo was doubtful towards various aspects of SE and some of the experiences he shared were also highly personal and emotional, suggesting that Mateo was positively disposed to sharing his honest experiences of learning about, and teaching, SE.

Data analysis

A hybrid approach of inductive and deductive theme development (Fereday & Muir-Cochrane, 2006) was used to analyze and triangulate Mateo's interviews, focus group and coursework. Acknowledging the longitudinal nature of the study, our analysis was ongoing, and throughout data collection the first author conducted and listened to the interviews, and wrote analytic memos that were used to facilitate follow up questions. We therefore adopted an interpretive approach for the inductive analysis, recognizing the difficulty of using a solely inductive approach within a field one is familiar with (Hatch, 2002).

First, all interviews were transcribed and Mateo's coursework was compiled in a word processing document. Second, data were read and re-read before the entire data set were inductively coded, identifying important features relevant to understanding Mateo's experience and knowledge development of learning and teaching SE. In this phase, our attention was drawn towards the three-level model of learning and how the networks appeared and developed in Mateo's experience. The third stage of the analysis involved a coding of the three levels. Fourth, we connected the codes and identified themes and patterns in the data (Crabtree & Miller, 1999) using the research question as a heading (i.e. How does a PST's knowledge of teaching and learning SE develop?). The aim of the analysis was to identify Mateo's knowledge development, and therefore, in this stage, the identified examples were collated into themes along the five learning experiences (team handball course, school placement in lower-secondary school, first period of the games course, school placement in upper-secondary school, and second period of the games course). Finally, the previously stages were closely scrutinized to confirm the findings and ensure the legitimation of the clustered themes.

Results

This study investigates a PST's knowledge development of teaching and learning SE. We present the case of Mateo, who learned to teach SE through a five phase learning experience that involved two university PETE courses (three periods) and two school placements. In the following sections, while presented within distinct segments, we have strived to consider Mateo's knowledge development within the individual phases and across the learning continuum.

Developing awareness and understanding of teaching and learning SE

At the outset of the first phase (team handball course), Mateo struggled to comprehend the contextualized learner experience (i.e. 'living the curriculum') and understand the various SE aspects, feeling confused about identifying with the teacher and student involvement in the model. However, after making an effort to read about SE, Mateo recognized 'why things had been said and why things were done as they were' (Interview 1). Consequently, he developed an awareness of the learner experience while appreciating various SE aspects. The school placement advanced Mateo's awareness and understanding of teaching the model,

> I got a 'aha' experience of why things are done as they are [in SE], why the model is as it is … The focus is drawn away from oneself, you get time to work more closely with each individual. That's what I feel was different and positive [compared to traditional teaching]. (Interview 1).

While the first two phases (team handball course and school placement) enabled Mateo to paraphrase various SE aspects, in the beginning of the third phase (first period of the games course), Mateo immediately realized the surface nature of his knowledge, 'I got surprised that I remembered or knew … that little … in relation to the understanding [of teaching and learning SE], compared to what I believed' (Interview 2). The learning experiences in phase three encouraged Mateo to continuously reflect and discuss teaching and learning in SE, resulting in him acknowledging various aspects of the model,

> It's important that everyone develop affiliation to the team and feel that they are useful, … make a contribution to the team and experience mastery … Also, I believe it's positive that [students through roles] learn a lot more about the activities. It becomes more thorough through the extended period of time. (Interview 2)

He further conveyed an acknowledgment for the comprehensiveness and complexity of SE and appreciated the student-centered teaching within the model, 'students are collaborating towards a shared learning outcome … , take responsibility, explain, teach and help each other … rather than getting something directly told, how it should be and how it should be done' (Interview 2). Moreover, Mateo recognized the alignment between various SE aspects,

> They are in a way connected … for example, working in teams and having routines relates to festivity. If you arrange a culminating event, it addresses the festivity while also involving the roles in which they [students] get to work with and develop prior [to the culminating event]. (Interview 2)

Ahead of the first period of phase four (second school placement), although Mateo was feeling anxious he was confident that he would be in control. Consequently, the diverse experiences he had in this period was surprising to him. Mateo revealed that students struggled to understand the task cards he provided them, and in the last lesson, he experienced a demoralizing incident,

> The tournament turned completely off the rails, it was complete chaos … they [the students] flew around like crazy chickens, no one knew where they were going and what to do … almost like they had forgotten their roles and their responsibilities. They didn't understand which court they should go to … People started shouting. Equipment suddenly disappeared, pens and whistles flew around. (Interview 3)

Developing conscious understanding of teaching and learning SE

Mateo admitted to reflecting on particular situations from the first period of school placement. Acknowledging that the students needed to learn and practice their roles before performing them, in the beginning of the second period of phase four (second school placement) Mateo used direct instruction before providing students with further responsibility. While admitting his need to become more familiar with student-centered teaching, Mateo shared how he reflected on particular situations within lessons,

> It took time with the points that went well in the end. It was difficult at first to find my role when things go by themselves. How much and on what should you interrupt? I could sometimes catch myself, 'Huff, you're just standing there dulling [not doing anything] rather than focus on something that you for example can provide feedback on'. (Interview 4)

Reflecting on his entire school placement experience, Mateo was able to unpack SE in considering how a teacher can adopt single concepts of the model,

> You might ignore some aspects, as long as they're not absolutely fundamental and central to the model. Then it can work without being negative for the achievement of the objectives … [Using aspects of SE] is something I imagine using in future physical education classes. I believe that every single part of SE, its concepts and characteristics can be positive, even if you don't use everything. For example, it's possible to use team and affiliation without the roles. It's a great way to promote cooperative learning, and can be used in the majority of activities. (Coursework 3)

Learning about progression and modification in phase five (second period of the games course), Mateo showed an ability to connect different SE concepts. This enabled him to consider the extent to which teachers need to modify the model,

> You can add elements half way through a season … However, I would not have started with just a few aspects of the model … I had quite a good experience when introducing a lot [of elements] right away … You need to consider, but I would certainly start with affiliation and roles … But you can of course have a gradual progression. Roles for example, gradually add more roles to the next season or halfway through the season … if you feel that it is a good flow … [or] if the students need new challenges. (Interview 5)

Connecting SE aspects to a broader philosophy of teaching and learning

Moreover, after the last phase (second period of the games course) Mateo was able to reflect on SE as the foundation for his teaching. He reflected on teaching and learning connecting concepts both from SE and other PETE courses related to the Norwegian physical education curriculum,

> We have recently studied physical education in more depth, the purposes of the subject, and the Norwegian Education Act … The model represents a lot [related to that] … both in terms of the Norwegian school, and physical education, it shares many of the same principles and represents many positive aspects. (Interview 5)

Mateo also implicated his own philosophy, and that of SE, in acknowledging that the foundation of the model can be used for other activities and across subjects,

> Collaborative learning is very central for me in relation to what I have experienced myself and what I believe in, in terms of … teaching philosophy. I think it's something I will use in the future, whether it's a theoretical subject like social studies as well as in physical education. (Interview 5)

The PETE program did not allow Mateo further SE learning experiences and on completion of the last phase, conscious of the overstated confidence he felt after the first two phases (team handball course and school placement), and aware of the comprehensiveness and complexity of using SE, Mateo questioned the extent of his knowledge about teaching through the model,

> I believe it's a lot to learn, both on the level of detail in terms of the theory [of SE] … [and also] in terms of experiences [with the model]. I still have an extremely long way to go, considering how much you experience [teaching through the model] and the changes I wanted to make across the six lessons. (Interview 5)

Discussion

The objective of this study was to investigate Mateo's continuing process of learning to teach SE as part of a PETE program and during the school placement component of the PETE program. The three-level model of learning was used as a framework to understand the question, 'How does a PST's knowledge of teaching and learning SE develop?'

While we believe that the findings of this study convey an understanding about PSTs' SE knowledge development that extends beyond the present case, we acknowledge the contextual limitations that the reader should recognize when considering the transferability of our findings. While Mateo's learning experience was relatively comprehensive, the short nature of the two school placements did not allow ample opportunities to teach SE. Studying a cohort of PSTs, while including a thorough investigation of their entire PETE education, could have provided insightful knowledge about how PSTs develop knowledge of teaching and learning SE. We also recognize that observation of Mateo's SE teaching would have allowed valuable insight into his SE teaching practice and subsequent growing knowledge.

While there is a growing body of research on PSTs learning to teach SE (e.g. Curtner-Smith & Sofo, 2004; Deenihan & MacPhail, 2013), there has been a noticeable dearth of research considering how PSTs learn, interpret and deliver SE (Stran & Curtner-Smith, 2009). Appreciating that researchers have followed PSTs through a series of learning experiences (Glotova & Hastie, 2014), we have recently

encouraged researchers to use a theoretical lens in examining teaching and learning SE (Hordvik et al., 2017). Acknowledging the limitations of this study, the use of the three-level model of learning as an analytic construct generates a more theoretical view of interconnection of content, process and contexts in learning to teach SE and, specifically in this study, how Mateo developed knowledge of teaching and learning SE.

Understanding Mateo's SE knowledge development

Knowledge growth within the three-level model of learning involves a process of a gradual development within a single level and in a transition process from one level to another (Korthagen et al., 2001). The knowledge development during the gestalt level is often unconscious and characterized by the 'development of awareness' (Marton & Booth, 1997). PSTs' develop their perception through 'suitable learning experiences' (Korthagen, 2010), which in this study relates to where Mateo become capable of discerning other aspects of SE than he was capable of discerning before.

Findings from the first three phases of this study (team handball course, first school placement, first period of games course) suggest that Mateo gradually developed awareness of various SE teaching and learning aspects. The first two phases allowed Mateo contextualized experiences as a learner (i.e. 'living the curriculum') and teacher (i.e. school placement), resulting in him developing awareness of critical SE aspects (e.g. teams, roles, holistic learning and teacher as facilitator). While being able to paraphrase the critical aspects and subsequently deliver them as a teacher, Mateo did not exhibit a high degree of perception towards teaching and learning SE. This prevented him in developing a more discerned understanding of a SE teaching practice (Korthagen, 2010). The lack of discussion and reflection on the learner experience in the first phase, together with limited opportunity to teaching during school placement, might be one explanation of the limited awareness Mateo displayed after the first two phases.

Phase three (first period of the games course) allowed Mateo further experiences as a learner, while being encouraged to reflect on the 'hows' and 'whys' of teaching and learning SE. Structuring his knowledge from phase one and two, this phase allowed Mateo to more critically consider the SE aspects he previously had become aware of. However, while having developed abstract gestalts concerning the notion of learning in SE, findings from phase four (second school placement) showed that he had not yet developed abstract gestalts of teaching SE. Hence, he needed additional contextualized experiences of teaching SE in order to 'desituate' knowledge of teaching within the model (Korthagen, 2010).

Phase four (second school placement) represented an interesting case in Mateo's knowledge development. The school placement context (two three-week periods) encouraged Mateo to immediately progress his SE teaching, resulting in him not allowing students to learn and practice their role. Consequently, the arrangement of a competition day in lesson three resulted in a negative experience for Mateo. Interestingly, while the challenging situations made him more sceptic towards SE, they also represented an important experience in his developing awareness of the relations between teaching and learning within the model. This enabled the development of abstract gestalts of teaching in SE, resulting in 'desituating' knowledge of teaching *and* learning the model (Korthagen, 2010). Consequently, Mateo could transfer from the gestalt to the schema level.

Knowledge within the schema level develops through reflection on the gestalt level where PSTs develop conscious schema of concepts, characteristics, and principles that is helpful in describing their SE teaching practice (Korthagen, 2010). The challenging situations in the first period of phase four (second school placement) could potentially have triggered Mateo's former gestalts (Korthagen, 2010), where his former notions of a teacher-centered teaching approach could have been reinforced. However, using his established SE knowledge while reflecting on the concrete situations, Mateo started to developed a conscious network of concepts, characteristics and principles that helped him understand the struggles he had experienced (Korthagen, 2010). This made him consciously aware of some of the reasons for 'why' he had faced these challenges (i.e. students need

time to learn their role), enabling him to change 'how' he was teaching (allowing students more time practicing their role).

Moreover, in the second period of the last school placement, teaching based on his recently developed knowledge while reflecting on his current experience, Mateo developed a conscious schema of teaching and learning SE that helped him understand his 'in situ' teaching practice. This resulted in Mateo developing a 'personal practical theory' of teaching SE (Korthagen, 2011) where he started to know how to act in concrete SE situations (e.g. when and how to provide feedback). Furthermore, the final phase (second period of games course) advanced Mateo's personal practical theory with him acknowledging the role of progression and modification in SE, while noting appreciation towards personal needs as a teacher and student needs as learners. We suggest that Mateo needed additional experiences of teaching SE to be able to convert the recently developed *conscious* understanding into *unconscious* practical actions.

PSTs who have reached the theory level display an abstract understanding of a variety of similar situations (Korthagen, 2010). Importantly, the findings from this study do not support a theory level in Mateo's knowledge, enabling a generalized understanding of several SE teaching and learning situations. We do, however, suggest that Mateo, after the final phase (second period of the games course), demonstrated understanding of teaching and learning SE that reflected knowledge at an abstract level (Korthagen, 2010). Studying the relationships between SE concepts, while connecting them with knowledge from various PETE courses, the theoretical foundation of SE became accessible for Mateo.

Consequently, we suggest that the findings of this study convey that the comprehensive learning experience resulted in Mateo developing knowledge about teaching and learning that goes beyond learning to teach SE. Hence, SE offered him a tool to operationalize practice on an abstract level in which he understood theory through practice. This highlights the longitudinal nature of learning to teach SE, supporting researchers who suggest that learning to teach the model requires a comprehensive learning experience that allows PSTs to develop deep knowledge of teaching and learning SE (Glotova & Hastie, 2014; Hordvik et al., 2017). We suggest that further suitable learning experiences of learning and teaching SE could potentially allowed Mateo to develop deeper and generalized understanding of a variety of SE teaching and learning situations.

Acknowledging the possibility that Mateo's knowledge growth was somewhat stifled because of contextual constrains (i.e. lack of exposure to other curriculum and instructional models, and limited opportunities to teach in school), we believe the longitudinal design of this study and the application of a theoretical lens allow us to suggest implications for future SE practice and research in PETE.

Implications for teacher education practice and future research

In discussing the extent to which the three-level model represents a theory of teacher learning, Korthagen et al. (2001) asked for more empirical support and elaboration of the relations within and across the levels. This study conveys that the three-level model offers a way to investigate a PST's knowledge development in a 'different context' (PETE), highlighting how gestalts and schemata are built from suitable experiences, with the potential for theory to develop through multiple and structured learning experiences. Moreover, our analysis suggests that most of the level reduction potentially occurs when PSTs teach SE in school, either through extended teaching experiences within their PETE program or when they begin to work as teachers. The three-level model of learning provided us with a theory to understand one PST's SE knowledge development. We encourage researchers to use the three-level model as a framework to both develop (physical education) teacher education practice and to conduct 'realistic research' that is grounded in 'the real practice of teaching teachers, taking into account the real people involved' (Korthagen et al., 2001, p. 272), that is, the PST and the teacher educator.

We believe that Mateo's continuing SE knowledge growth allows us to suggest two connected implications for physical education teacher education. First, teacher educators need to acknowledge

that learning to teach SE and other curriculum and instructional models is more than learning how to deliver models of teaching. Teacher educators need to allow for a continuing growth of understanding where PSTs develop knowledge through various teaching and learning experiences tailored around their needs and concerns. Complementing this, physical education teacher educators need to collaborate on both a structural and situational level. This implies collegial discussion about the program design (disposition of practical and theoretical courses) and consideration of the most effective way to sequence the introduction of curriculum and instructional models.

Finally, returning to the concept of 'chain of evidence' mentioned at the start of the paper, we encourage researchers to explore how teachers operationalize what they have learned in teacher education and further investigate how this is visible in their teaching practice, and in turn how this practice promotes meaningful learning experiences for students (Beni, Fletcher, & Ní Chróinín, 2016).

Disclosure statement

No potential conflict of interest was reported by the authors.

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Study III

Hordvik, M., MacPhail, A., & Ronglan, L. T. (Under review, submitted December 13, 2017). Developing a pedagogy of teacher education using self-study: A rhizomatic examination of negotiating learning and practice. *Journal of Teacher Education.*

Developing a Pedagogy of Teacher Education using Self-Study: A Rhizomatic Examination of Negotiating Learning and Practice

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Abstract

The authors examine the processes of developing a pedagogy of teacher education. Drawing on multiple data sources (video and audio, reflective diary, and focus groups) collected throughout a recursive teaching and learning cycle (university course, school placement, university course), this study used concepts from rhizomatics, a non-linear theory that emphasizes relationships among a multitude of interacting elements in a given social situation. The study was guided by the question, "How does a teacher educator negotiate his learning and practice within a one-year self-study as he develops a pedagogy of teacher education?" We seek to highlight the complexity of teacher education learning, and to show how a conflux of elements collectively shape a teacher educator's practice. Consequently, the study highlights how the pedagogy of teacher education becomes a collectively negotiated enterprise.

Keywords: health and physical education teacher education, practitioner inquiry, preservice teacher education, professional development, qualitative research

Introduction

A pedagogy of teacher education is in its infancy as an academic area (Korthagen, 2016). Researchers (i.e., Darling-Hammond, 2006; Korthagen, 2016; Zeichner, 2005) who advocate for a pedagogy of teacher education argue that it should involve "a knowledge of teaching about teaching and a knowledge of learning about teaching and how the two influence one another" (Loughran, 2008, p. 1180). While there appears to be a general agreement among teacher education researchers about the importance of developing a pedagogy of teacher education (i.e., Loughran, 2006) the development, learning and practice of teacher educators is under-studied and under-supported (Knight et al., 2014; Korthagen, 2016).

Although limited research has focused on teacher educators' professional development (Loughran, 2014; Lunenberg, Dengerink, & Korthagen, 2014), the establishment of the "International Forum for Teacher Educator Professional Development" (a EU founded project that aims to develop, implement and improve a knowledge base for teacher educators) (see Vanassche et al., 2015) provides a valuable first step to identifying the professional learning needs of teacher educators. Despite teacher educators' strong desire for professional development programmes (Czerniawski, Guberman, & MacPhail, 2017) and the positive results of such programs on their development of a pedagogy for teacher education (Hadar & Brody, 2010), there is an absence of educational opportunities that specifically help teacher educators develop their teaching practices (Dinkelman, Margolis, & Sikkenga, 2006; Goodwin et al., 2014). As such, as a significant number of teacher educators move from classroom teacher to teacher educators, they often struggle to develop an appropriate and effective pedagogy of teacher education (Ritter, 2011; Williams, Ritter, & Bullock, 2012).

Loughran (2006) pointed to the paradox that despite the obvious complexity of teaching and learning in teacher education, it is difficult to find studies that examine in detail both teaching about teaching and learning about teaching. This made him advocate for the use of the self-study methodology (LaBoskey, 2004) as a way for teacher educators to purposefully examining this relationship in their practice. While there is examples of self-study of teacher education practices researchers (e.g., Berry, 2007; Ní Chróinín, Fletcher, & O'Sullivan, 2017) that consider both teaching *and* learning about teaching, we argue that there continues to be a need for studies where researchers use self-study methodology as a way to develop a research-based knowledge and shared understanding of a pedagogy of teacher education.

Drawing on Korthagen's (2016) concluding remarks in his review of studies on the

pedagogy of teacher education, we favor a mutual relationship between self-study research, professional development as teacher educator, and a pedagogy of teacher education. Korthagen (2016) raised the question of how knowledge about the pedagogy of teacher education can start to positively influence the professional development of teacher educators. Supporting earlier work (Lunenberg et al., 2014; Murray, 2010), he stated that self-study research should have a central place in the professional development of teacher educators because this kind of research into one's own practice helps teacher educators develop a research-based foundation of their own practice (i.e., a pedagogy of teacher education).

In the editorial for the 2014 special issue in JTE on "Professional development and practices of teacher educators", Knight et al. (2014, p. 268) stated that, "We assume that teacher educator learning and teacher educator preparation are similarly complex [as teaching and teacher learning]. However, we lack a well-developed knowledge base that would explicate this complexity". While articles in the special issue explored and revealed some of this complexity (e.g., Castro Superfine & Li, 2014; Goodwin et al., 2014), we argue that there is a need for research that deliberately considers teacher educator learning and practice as a complex, relational and interactive process (Strom & Martin, 2017). As such, Strom (2015) argued that "researchers must advocate for an *ontological turn* (Lather & St. Pierre, 2013) in teacher education research that focuses on the process(es) of teaching, rather than the outcomes alone" (p. 331). While focusing on classroom teaching, we adopt Strom's (2015) call to encourage studies that investigate interactions between teacher educators and pre-service teachers (PSTs), and the ways that multiple classroom-level elements shape teaching practice.

In this study, we examine the processes of developing a pedagogy of teacher education for one novice teacher educator. Specifically, through the first author's self-study research we investigate the interactions between a novice teacher educator and a group of PSTs, while considering the numerous contextual elements that influence the teacher educators' learning and practice. Drawing on multiple data sources (video and audio, reflective diary, and focus groups) collected throughout a recursive teaching and learning cycle (university course, school placement, university course), this study was guided by the question, "How does a teacher educator negotiate his learning and practice within a one-year self-study as he develops a pedagogy of teacher education?"

The self-study methodology (LaBoskey, 2004; Pinnegar & Hamilton, 2009) provided a purposeful tool to consider teacher education practice and the relationship between teaching and learning. To analyze the teacher educator's learning and practice, we engaged with

rhizomatics (Deleuze & Guattari, 1987), a theoretical lens that emphasizes relationships among a multitude of interacting variables in a given social situation. This framework facilitated the examination of teacher education learning and practice as interactional, relational and situated, shaped by the teacher educator, PSTs, and other contextual elements. As such, this study contributes to the development of a robust research-based knowledge base for, and shared understanding of, the pedagogy of teacher education. We seek to highlight the complexity of teacher education learning, and to show how a conflux of elements collectively shape a teacher educator's practice. Consequently, the study highlights how the pedagogy of teacher education becomes a collectively negotiated enterprise.

Conceptual framework

To consider the nonlinear processes of teacher educator practice and learning, while attending to the relationships and interactions among components that shapes teaching and learning, we argue that teacher education researchers need to engage with non-linear conceptual frameworks (Cochran-Smith, Ell, Ludlow, Grudnoff, & Aitken, 2014; Strom, 2015). In this study, we draw on rhizomatics (Deleuze & Guattari, 1987), a non-linear theory of thinking and social activity that offers both concepts and a language to think differently, and in more complex and relational ways about teaching and learning (Strom, 2015).

The rhizome is central to the rhizomatics, and Deleuze and Guattari (1987) contrasted the rhizome with the Western thought that they termed the "tree logic". While the rhizome is a bulb that grows unpredictably in all directions, the rigid tree is stable, hierarchical and affirms linear thinking. Rhizomes are a-centered multiplicities, "composed of heterogeneous elements that form connections and changes as they come into composition, always in a fluid state of *becoming different* as they move from one threshold to another" (Strom & Martin, 2017, p. 6). Rhizomatics focus on processes rather than products, and allows us to consider interaction and interplay between multitudes of elements. Deleuze and Guattari (1987) offer various rhizomatic concepts that can be used as analytic tools to think differently about social activity, allowing for the consideration of teaching and learning as complex and contextually situated phenomena (Strom & Martin, 2017). While we acknowledge the difficulty of considering one rhizomatic concept without considering others (St. Pierre, 2016), for the purpose and scope of this paper, our main focus is on the concept of assemblage.

Assemblage

An assemblage is an "aggregate of elements, both human and non-human, that function collectively in a contextual unique manner to produce something (e.g., teaching practice, a situated identity) " (Strom & Martin, 2017, p. 7). A university classroom is an assemblage, composed of teacher educators (their knowledge, experiences, and beliefs), the PSTs (their knowledge, experiences, beliefs, and investments), the physical space (journal articles, books, equipment, the room environment), and discourses (the teacher educator's expectations about the PSTs and vice versa) (De Freitas, 2012, p. 562). Considering teaching as assemblage means considering the various components of the classroom— the teacher educator, the PSTs, the content, the room environment, and so on—as "working collectively to shape teaching practices, rather than viewing them as discrete variables that are independent of one another" (Strom, 2015, p. 322). Teaching and learning becomes co-produced through the particular conflux of elements and the way they iteratively work together (Strom & Martin, 2017). As such, instead of viewing the different elements as discrete factors that are independent of each other, teaching and learning becomes a collective process produced by the relations and functions of elements (humans, non-humans, actions, or events). The concept of assemblage allows us to consider the teacher educator and PSTs as only two connected elements contributing to teacher educator practice. Further, the concept allows us to consider the relationship between teaching and learning, while discarding the notion of the teacher educator as an autonomous person that do teaching and transfer expert knowledge of teaching to PSTs.

In this article, we use the concept of assemblage to analyze a teacher educator's practice and the way different processes influenced practice and the relationship between teaching and learning. The purpose is to extend our knowledge about the interrelated relationship between teaching about teaching and learning about teaching, and the processes of developing a pedagogy of teacher education.

Elements influencing teacher educator' practice

A systematic review of the self-study literature revealed how various aspects or elements in the classroom, university and broader political institutions influence teacher educators' practice (Vanassche & Kelchtermans, 2015). We argue that the way these aspects and elements combine and interact produce the teacher educator's practice.

In the classroom, the teacher educator brings multiple aspects that shape their practice, including their beliefs and values (Russell, 2007), biography (Graber & Schempp, 2000),

occupational socialization (Cutforth, 2013; Lee & Curtner-Smith, 2011), knowledge and understanding (Castro Superfine & Li, 2014; Dowling, 2006), personal practical knowledge (Ross & Chan, 2016), perspectives (Lavay, Henderson, French, & Guthrie, 2012), and perceptions and expectations (Graber, 1990). For example, in their collaborative self-study of teaching about teaching a student-centered model, Fletcher and Casey (2014) experienced challenges of negotiating between their prior experiences and practice as school teachers, the articulation of the nature of teaching, and the PSTs' expectations of the course and attitude towards learning about teaching.

Pre-service teachers influence teacher educators' practice, and Loughran (2014) argued that "the concerns, issues, and expectations of student teachers [i.e., PSTs] exist and must be acknowledged and responded to in real ways through teacher education" (p. 5). PSTs bring with them their backgrounds, occupational socialization, beliefs, and expectations to the classroom. While it is possible for teacher education to change PSTs' strong beliefs about teaching and learning (Sosu & Gray, 2012), teacher educators' practice is affected by their perceptions of PSTs' agenda for a given course (Graber, 1990). For example, Berry (2007) identified multiple tensions in her teacher education practice that occurred in the interplay between matching the objectives of the teacher education programme with the needs and concerns that PSTs expressed for their own learning.

The powerful influence of both the professional context (e.g., Korthagen, Loughran, & Russell, 2006; Mordal-Moen & Green, 2014) and the broader national social, political and educational contexts within which teacher educators work (e.g., Chróinín, O'Sullivan, & Tormey, 2013; Goodwin et al., 2014; Swennen, Shagrir, & Cooper, 2009) is documented in the literature. Teacher educators' practice is influenced by the program structure (Loughran, 2014), institutional expectations (Cutforth, 2013), faculty colleagues (MacPhail, 2014), and multiple stakeholders (Goodwin et al., 2014). Grossman and McDonald (2008) discussed contextual influences that make the development of a pedagogy of teacher education difficult. First, through standards for accreditation and requirements for licensure, states dictate the contours of teacher education programs. Second, the vast majority of teacher education programs are situated within institutions of higher education and operate within an institutional context that constrains the work of teacher education. Finally, teacher education programs are situated in local contexts and labor markets and consequently supply and demand issues often determine what is and is not possible.

Method

This study was grounded in self-study methodology (LaBoskey, 2004; Pinnegar & Hamilton, 2009), which we advocate for as a way of purposefully examining the relationship between teaching and learning (Loughran, 2006). In this paper, we aim to "provoke, challenge, and illuminate rather than confirm and settle" (Bullough & Pinnegar, 2001, p. 20), while moving beyond stories in our development of knowledge of teaching about teaching (Loughran, 2010). As a guide for our enquiry we used LaBoskey's (2004) five characteristics of self-studies: (a) they are self-initiated and self-focused; (b) they are improvement-aimed; (c) they are interactive in terms of the process and potential product(s); (d) they use multiple, primarily qualitative methods, and; (e) they provide exemplar-based validation understood in trustworthiness.

Appreciating the expectations of self-study research, while acknowledging the rhizomatic focus on nonlinear and relational processes, we created a self-study-assemblage composed of the teacher educator (first author), his supervisors (second and third author) and critical friend (Schuck & Russell, 2005) that functioned on a meta-level (Fletcher, Ní Chróinín, & O'Sullivan, 2016), the PSTs, a student-centered model, the classroom, multiple qualitative data methods (see Figure 1.), conventional and postmodern analytic methods, journal articles (e.g., Fletcher & Casey, 2014; Strom, 2015), and books (e.g., Berry, 2007; Loughran, 2006).

We argue that the involvement of a research team with complementary knowledge and experience contributed to the trustworthiness of this self-study. The first author, Marcus (a pseudonym used for blind review), had considerable experience as teacher and coach, while having undertaken his higher education within the field of coaching and psychology. The third author (name removed for blind review) served as the main supervisor and was located at the same university as Marcus. His area of expertise is coaching, coach education, and sociology. The second author (name removed for blind review) served as co-supervisor and was located in Ireland. Her area of expertise is physical education and teacher education, self-study, curriculum development, and assessment. The critical friend (name removed for blind review) resided within the same university as the second author. She is internationally renowned for upskilling PSTs, teachers and teacher educators in the area of sport pedagogy and has contributed extensively to research in the field.

In presenting the study data, we acknowledge that throughout the study we made "agential cuts, or decisions that shaped the story in particular ways (Barad, 2007) as well as

influenced what count as data" (Strom, 2015, p. 324). We recognize that our knowledge and experiences noted above informed and shaped the study and its findings, while acknowledging the way multiple interactive and relational processes between human and nonhuman elements collectively constructed knowledge of teacher education practice and learning. In the following sections, we describe in detail the context for the study, and the data collection and analysis procedures used.

Context

The Norwegian University (pseudonym used for blind review) is a fifty-year old scientific university with a national responsibility for research and education in the field of sport sciences. The context of this study is the three-year undergraduate physical education teacher education program. Based on the National Curriculum Regulations for physical education teacher education (departementet, 2003), the program aims to educate PSTs with core professional knowledge in five competence areas; academic, didactic, social, developmental, and professional ethics. The program contains theoretical and practical courses (a combination of compulsory and optional) and two six-week school placements, each divided into two periods of teaching within the same school. The program serves approximately one-hundred PSTs over the three years.

Participants. The participants in this study were one teacher educator and twenty-one PSTs (six females and fifteen males). Marcus, a 28-year-old Norwegian white male, was a full-time doctoral candidate investigating teaching and learning in physical education teacher education through self-study methodology. From a middle class, countryside background, Marcus was active in sports and started to coach team handball at the age of fifteen. He had undertaken his entire higher education at the Norwegian University, mainly within the field of coaching and psychology (bachelor and Master's), with a one-year pedagogy supplementary degree that qualified him as a teacher. He worked as a high school physical education teacher for over two years before embarking on the PhD position at the Norwegian University. It was through his work as a physical education teacher that Marcus developed an acknowledgment for the complexity of teaching, and an interest in how PSTs are prepared for the reality of teaching. As part of the four-year doctoral program, Marcus is expected to teach and this teaching opportunity allowed him to study his practice of teaching PTSs about teaching physical education.

The PSTs, aged between 20 and 29 years old, were in their fifth and sixth semester of the three-year physical education teacher education program. While the age difference was

relatively wide-ranging, sixteen of the PSTs graduated from high school one or two years prior to entering the physical education teacher education program. While growing up in different parts of Norway, the PSTs had similar physical education and sports backgrounds and experiences. They reported positive experiences from physical education, sharing that they were skilled and received high grades. Their appreciation for sports reflected their choice of educational program in high school where the majority choosing sports and physical education. The PSTs had participated in organized sport while all, except one, had a background in one or two of the most widespread organized team sports in Norway (i.e., soccer and team handball).

Setting. This study was undertaken through one university course divided into two periods, and a PSTs school placement taking place between the two periods (see Figure 1.). The university course was a self-selected seven-credit practical based course, named "Specialization in games". The first period consisted of thirteen 90-minute lessons, while the second period consisted of ten 90-minute lessons. The program description stated that the goals of the course were for PSTs to develop pedagogical and didactic skills, be able to discuss the activities culturally and ethically, and contribute to creativity and innovative processes. From these broad course goals, we developed specific objectives that focused on learning how to teach games through a student-centered model that is grounded in social constructivist view of teaching and learning (Siedentop, Hastie, & Van Der Mars, 2011).

The PSTs' school placement was composed of two three week periods in high school. PSTs were located across three counties and spread over thirteen different urban and suburban high schools, catering for between 500-1000 students. The PSTs were divided into pairs and assigned a mentor. PSTs were required weekly to teach and actively observe their peer for eight hours, and undertake six hours shared supervision with their mentor. Each of the PSTs were allocated at least one physical education class they were required to teach using the chosen student-centred model.

Data collection

Ethical approval for the study was granted from the Norwegian Social Science Data Services and each PST signed a consent form. Data were collected over an 8-month period and included observation of Marcus' teaching practice (audio-visual recording), his reflective diary, and focus groups with PSTs (see Figure 1.).

Given the particular aim to study teacher educator practice, the main data source was observation using audio-visual recording (Erickson, 1992) of the university lessons that

Marcus taught. We observed each lesson (23 lessons and a practical exam), resulting in 50 hours of video recordings that allowed insights into the processes of his teaching practice. Acknowledging the limitations of a panoramic and fixed camera (e.g., facial expressions) (Cohen, Manion, & Morrison, 2011), a video camera was placed in a position that allowed us to capture a panoramic view of the entire sports hall, while a wireless microphone attached to Marcus synchronized the audio with the visual picture. The microphone captured all interaction between Marcus and the PSTs, and between PSTs in whole-class discussion.

A total of 31 reflective diary (Lyons & Freidus, 2004) entries resulting in 65 pages of text were recorded as Marcus developed the course and reflected after each lesson. The amount of text for entries varied from a few sentences (in the planning stages) to over three pages. The reflective diary provided a window into Marcus' reflections about critical incidence detected in the video recordings, his evolving experience as teacher educator, and how he perceived different elements (e.g., the PSTs and the student-centred model) to influence his teaching. While having space for open-ended reflection, the post lesson reflections were guided by a template: (i) How were my assumptions challenged?, (ii) How/when was I made to feel vulnerable? How did I handle this?, (iii) What moments were particularly joyful/meaningful to me?, and (iv) What insight and understanding about teaching and learning did I gain? (Fletcher et al., 2016).

Twelve focus groups (ranging between 50 and 100 minutes) were conducted with the PSTs (Krueger & Casey, 2015). The three PST groups were interviewed four times: (i) at the end of first period of the university course and prior to school placement, (ii) in-between school placement, (iii), end of school placement, and (iv), end of second period of the university course. This allowed the mapping of the PSTs' expectations, experiences and perceptions of multiple elements (e.g., Marcus, the student-centred model, the program as a whole) influencing their university course and school placement experiences.

The third author was the main mediator of the focus groups, while Marcus took a position in the middle between being a facilitator and participant. Marcus participated in the focus groups in the belief that his experience with the PSTs would allow him to follow up on responses to questions with concrete examples from their shared learning experience. This position allowed him to engage in the discussion while prompting follow up questions when necessary.

Data analysis

We argue that investigating the way elements in an assemblage work together is a productive analytic site when pursuing research from a rhizomatic frame (Strom & Martin, 2017). Drawing on the analytic work of Strom (2014, 2015), we analyzed the data employing traditional qualitative analytic conventions (such as coding) with situational analysis (a postmodern form of grounded theory) (Clarke, 2003) and rhizomatic mapping (Deleuze & Guattari, 1987) (a methodology based on the properties of the rhizome). Blending these analytic methods allowed us to examine the multiple, situated, and relational activities comprising Marcus' practice. The nonlinear analysis process included data walking, rhizomatic mapping, situational analysis, and memo writing.

The first level in creating rhizomatic maps involved a strategy of "data walking" (Strom, 2014; Waterhouse, 2011), an inductive approach to exploring the data. This process involved reading the focus groups and reflective diary multiple times, while highlighting sections of interest and noting connections between the data and the theoretical literature, the empirical literature, and other data sources. We also "walked" through all videoed lessons using the analytic data software program Interplay Sports, allowing for coding of multiple variables. Our focus in walking through the data was on connections, interactions, and processes rather than categories.

We used the data software Inspiration to create rhizomatic maps that are flexible and show multidirectional relationships among elements within them (Strom, 2015). This was a two-stage process. First, we created one map from each of Marcus' lessons. Second, we created one map for each of the three periods of the study (first period of university course – PST school placement – second period of university course). In both the lesson and course maps, we entered the main ideas from the initial coding process into the maps, creating expandable "bubbles" containing each idea. We then began clustering these data bubbles together in ways that related to the facets of constructing practice, such as "negotiating with the student-centered model", "constraining conditions", and "negotiating with PSTs". Rather than reducing the data to a category word or phrase, this method kept us immersed in the detail and complexity of the data (MacLure, 2013).

We used situational analysis to create organized situational charts which named "who and what" matter in the three periods of the study, including the major human and non-human elements present in the three courses (Clarke, 2003). We then theorized the lines we had drawn or the connections made within the three rhizomatic maps. We considered these as the

social negotiations within each of the three periods – that is, the relations and interactions between important elements that shaped Marcus' ongoing practices. We wrote analytic memos (Charmaz, 2006) from the rhizomatic maps and situational analysis, developing the main ideas in more detail and creating lengthier descriptions of events to re-situate the data. These memos helped us make sense of the emerging relationships between Marcus, his PSTs, and other elements in the classroom and university setting, as well as the ways the resulting linkages shaped his practices within the two university course periods.

After making sense of the connections, relations and interactions within each of the three periods, we engaged in a synthesis process where we created a rhizomatic map, while theorizing the lines we had drawn or the connections made within the rhizomatic maps (the social negotiations), and wrote analytic memos. This process helped us make sense of the connections and interactions across the three periods. Finally, the synthesis memos were used to develop the main themes in greater detail and create lengthier descriptions of events that would later support the key findings.

Findings

To demonstrate the complexity of teacher education practice and learning, we focus on Marcus' self-study as he worked to construct a pedagogy of teacher education. Marcus was teaching PSTs about teaching through a university course, divided into two periods with a PST school placement inbetween. We argue that the ways human and nonhuman elements in the practice interacted help explain the degree to which Marcus and the PSTs could engage in meaningful practice of teaching and learning. Furthermore, we contend that evolving learning experiences combined with Marcus continuously negotiating with the PSTs and with himself, worked to change Marcus practice' and the relationship between teaching and learning.

In developing our case, we first describe the contextual elements influencing Marcus' practice and convey the way they constrained his teaching in the beginning of the first period. We then examine how Marcus negotiated the contextual elements with the PSTs throughout the course and the way PSTs' evolving experiences changed the contextual element's influence on Marcus' practice. Last, we examine the way Marcus negotiated with himself throughout the course, and show how these processes combined with his evolving experience and changed the way he was teaching and learning.

Contextual elements influencing practice

While some contextual elements (size of sports hall, equipment, number of lessons) worked enabling Marcus' practice, three interconnected elements in the setting created constraining conditions; (i) the nature of teacher education pedagogy, (ii) the student-centered model, and (iii) the tradition of the program. While these elements influenced the teaching and learning environment throughout the two university periods, they were particularly constraining on Marcus' practice at the outset of the first period.

First, the nature of teacher education pedagogy created expectations in Marcus' practice within which he had a desire to articulate the what, how and why of teaching. As he wrote in his reflective diary before the course, "my aim is that PSTs should be critical, understand why I teach as I do and develop their personal picture of how they want to teach". Discussing with his critical friend, Marcus decided to use an overall twofold lesson structure. In the first 70 minutes of lessons, he aimed to model teaching of the content, while providing insights to PSTs as prospective teachers. In the last 20 minutes, he aimed to engage PSTs in reflection and discussion about the content, his teaching and their experiences as learners. Marcus believed this structure would facilitate his teaching and help PSTs to "distinguish between their student experience and [when he deliberately required them to] discuss as prospective teachers" (Reflective diary, prior to the course). While the expectations of teacher education pedagogy provided direction for Marcus' practice, his limited experience of teaching PSTs about teaching made it challenging to teach both the content and the nature of his teaching. After the first period, Marcus reflected on how the teacher education requirements influenced his practice as a novice teacher educator,

> I have experienced the "practice shock". My background is from teaching, but now I am teaching prospective teachers (teach to teach). Because I desired to articulate both the what, how and why I needed to explain things to the PSTs as both students and prospective teachers. Consequently, it's become a chaos in my head. (Reflective diary, lesson fourteen)

Second, Marcus and the PSTs' level of familiarity with the student-centered model influenced Marcus' practice. Except from a course Marcus taught to six of the PSTs the year before (Hordvik, MacPhail, & Ronglan, 2017), Marcus and the PSTs had limited or no experience with the model. Because the model is compressive and complex with multiple concrete teaching and learning features (Hordvik et al., 2017), Marcus' implementation of it made him and the PSTs struggle to carry out the different teaching and learning

responsibilities in the beginning of the course. While Marcus felt the model facilitated the development of a student-centered teaching approach, his limited experience with the model made him feel constrained, "The different tasks and responsibilities as a teacher (educator) and the fact that the model have many teaching requirements makes me feel constrained and enslaved, I don't have the same flexibility as I had as teacher in school" (Reflective diary, lesson six).

Third, the tradition of the particular teacher education program and the specific university course created strong expectations in the teaching and learning environment. The program in general was not focusing on specific student-centered models, and practical courses at the university were traditionally aimed at teaching PSTs solely about content. Furthermore, the specific course had been taught by the same teacher educator for several years, with a tradition of highlighting the content of multiple games. This made PSTs expect to learn about the content of games and to be solely physically active in lessons. During a lesson discussion, one PST group shared their frustration of Marcus' practice, "We feel there's a lot of talk first and then we have some physical activity, then it's ten minutes talk again and then some physical activity and ten minutes talk again... [Where is] the joy of movement?"

Negotiating the contextual elements with PSTs

Because of their sport background, PSTs were used to experiencing mastery in physical education. Combined with their unfamiliarity with the student-centered model and strong expectations of the course content and practice, PSTs became critical of Marcus' practice in the beginning of the first period. As a way to develop a meaningful relationship between teaching and learning, Marcus tried to negotiate his practice with the PSTs. We observed how he primarily relied on two strategies in the first university period, (i) interacting with and allowing PSTs a voice, and (ii) displaying uncertainty and vulnerability.

First, continuously interacting with the PSTs, Marcus was trying to make them acknowledge the student-centered model, his lesson structure and practice (i.e., articulate the what, how and why). For example, we observed how he encouraged PSTs to contribute to the discussion, asking questions like: "What's your thoughts about that?", or commenting that: "It's very positive that you are critical and consider if there's something we can do differently". Specifically, the discussion at the end of lessons provided an arena for him to negotiate with the PSTs. He experimented with different approaches in his effort to encourage PSTs to reflect on and question both the student-centered model, his teaching of it, and their

experiences as learners. The following extract from a lesson show how Marcus' practice allowed PSTs to scrutinize his teaching, while providing an opportunity for him to adapt the model, the lesson structure and practice,

> Mary: "Do we get enough time to practice [be physically active]? Someone had measured that we were sitting still fifty minutes of last lesson...
>
> Marcus: "That's a very interesting observation, but remember that the student lesson [him modeling teaching] lasts seventy minutes [out of ninety minutes]. However, it's certainly a balance. I'm not afraid of talking so much here, because my goal isn't that you should have a lot of physical activity, but that you learn how to teach. It's important you know that you're not here to have a physical education lesson, you're here to learn how to teach."

Second, we also noticed how the vulnerability of Marcus' practice functioned as a negotiation strategy in itself. For example, he allowed PSTs to scrutinize his practice both in lessons and in the focus groups, while further trying to acknowledge PSTs' experiences and suggestions. The discussion referred to above made it clear for Marcus that many of the PSTs misunderstood the rationale behind the lesson structure. Consequently, he started the next lesson repeating the structure, while also changing a few things in his practice. Marcus' acknowledgment of PSTs' needs and concerns made PSTs feel that they had a voice in the teaching and learning environment. Caroline explained, "We are being taken seriously... I feel my voice means something here".

Furthermore, Marcus decided to share his reflective diary with the PSTs. Having struggled to provide insights into the nature and uncertainty of teaching, we noticed how this facilitated exploration of the relationship between teaching and learning. Scott explained, "When he [Marcus] reflects on why he did as he did, justifies his choices, that makes me think, 'Would I have done it the same way?', or, 'That was a good solution' ". This interaction, allowing and acknowledging PSTs beliefs and displaying Marcus' vulnerability, fostered a more meaningful practice and engagement. Jack explained how Marcus' practice enabled his relationship with the PSTs,

> It's important that we don't experience that there is one correct answer. For example, when Marcus experienced that he could do something different. We discussed it in groups and experienced that there is no one answer [but multiple], it depends on the situation and the different aspects that are involved ... [This contributes to] the

relationship between the teacher educator and PST, a good dynamic in the [learning] process.

Our analysis of the second university period conveys the way PSTs evolving experiences – that is, the first university period and school placement – worked to both enable and constrain Marcus' practice and the relationship between teaching and learning. Particularly, PSTs' previous learning experiences made them believe that they had successfully completed their education of the student-centered model. In the focus groups before the second period, they therefore strongly encouraged Marcus to focus on the content of multiple games and pay less attention to the model as such. Marcus stretched to align his practice with the PSTs needs and concerns, and most PSTs valued the second period as the most worthwhile for them as prospective teachers. As one PST explained, "I absolutely agree that it has been a lot better [in the second period]. This was what I expected; learn new games that would allow me to bring innovative things into school".

However, while PSTs showed high enthusiasm when practicing the games, they showed limited engagement when Marcus tried to encourage them to discuss features of the student-centered model or the nature of teaching. This lack of enthusiasm constrained Marcus' practice within which he tried to negotiate with the PSTs about the relationship between the content of games, the student-centered model, and the nature of teaching. We observed how Marcus carried out multiple strategies in trying to encourage and engage PSTs in this endeavor.

For example, as a way to connect some of the contextual struggles PSTs had experienced in school placement, he develop "pedagogical packages" aligned to the different games. This included a document describing an imaginary context (e.g., 10th grade, second class teaching the model, part use of a sports hall) and accompanying model material (e.g., block plan, descriptions of responsibilities). Marcus used the package as a starting point for his teaching in trying to engage PSTs and allow them to appreciate the multiple ways the model could be adapted and modified. Another strategy was to provide pre-class reading of a particular feature of the student-centered model that he further integrated into the lesson, and discussed at the end of lessons. However, because PSTs rarely read the literature, showed low enthusiasm towards the model features and in discussions about the nature of teaching, we observed how Marcus struggled to develop a worthwhile relationship between teaching and learning. Abby's comment provides insight into the ways PSTs' evolving experiences worked

against Marcus' effort to engage them in more in-depth discussion about the student-centered model and the nature of teaching,

> I felt I had used a lot of time learning about it [the student-centered model]. I was more motivated to learn about games ... [I think I would have learned more] if I for example had read the literature, and involved myself more in the discussion ... But we didn't care to pay attention to all the different elements he introduced.

Marcus' internal negotiations

In developing a pedagogy of teacher education, Marcus aimed to change from his established teacher-centered practice emphasizing a high level of physical activity, towards developing a PST-centered practice articulating the what, how and why of teaching and learning. His different practice ambition – that is, different from his established teaching practice, different from the program and course tradition, and different from PST expectations – created conditions in the first university period where Marcus needed to negotiate between his own personality, the student-centered model, and his former and current philosophy.

"Optimality" was prominent in Marcus' reflective diary, reflecting his strong desire to maintain the fidelity of the model and to teach perfectly. This resulted in overly packed lessons where he tried to explain every aspect of his practice to the PSTs. For example, in one lesson he used a lot of time explaining central features of the student-centered model to PSTs as prospective teachers before explaining why he had chosen to do so. Marcus' reflections show how his eagerness to teach every aspect of teacher education pedagogy influenced his teaching, "It is incredibly difficult to teach PSTs as students and, in addition, explain why I do as I do... It is too much information to provide, they need feedback and tasks as a student and PSTs" (Reflective diary, lesson five). Furthermore, Marcus' continual strive for perfectionism also made him overly conscious of the way PSTs perceived the model and his practice. Conscious of the tradition, during lessons he was always conscious of the "verbal and nonverbal feedback from the PSTs" (Reflective diary, lesson six) and could "feel the impatience and desire of the PSTs" (Reflective diary, lesson eight).

The student-centered model represented a different teaching practice and was important for Marcus in developing a new philosophy. However, because of Marcus' limited experience with the model, he experienced the expectations created by the model as challenging. For example, Marcus felt he lost control when allowing PSTs responsibility for their own learning. He became unsure about his role as teacher (educator) within the model. Because of his unfamiliarity with the model, Marcus questioned how a student-centred

approach should feel and look like, “I often feel it’s a chaos, I’m running back and forth. However, maybe that’s not so wrong? ... I have to develop my own way of teaching, however, sometimes I would have preferred having some preferences” (Reflective diary, lesson four).

In his previous practice as a teacher, Marcus was always in charge of drills, in control and believed a lesson with high levels of physical activity was the most worthwhile. His developing philosophy had a more holistic perspective on teaching and learning in physical education. Modeling teaching of the student-centered model, he now tried to allow PSTs time to collaborate and experiment, and valued the learning developing from these experiences. However, teaching differently from his established teaching practice was difficult and we observed how he at times lapsed into his former philosophy. Marcus reflected on how his former practice influenced and created a tension in his current practice, constraining his aim to articulate the nature of his practice,

> I felt the lesson went well because there was a lot of physical activity and a nice flow. However, it was teacher-centered ... There is a tension between my current and former beliefs and philosophy of teaching. I feel it has been a good lesson because there was a lot of physical activity and a good flow, and I think the PSTs liked it because they were physically active. However, they may not have got an understanding of why I organized as I did. (Reflective diary, lesson eight)

While Marcus valued the end of lesson discussions, he needed to work in not neglecting PSTs’ experiences and beliefs, “I expected that my teaching was going to be criticized. Nevertheless, I had to concentrate not always ‘defend’ the choices I had made and neglect their opinions” (Reflective diary, lesson three). While he was conscious about this and wanted PSTs to feel that they could “share their perceptions, ideas and opinions without the fear that the answer is wrong or that I will argue against the response each time” (Reflective diary, lesson eight), he struggled not to be the “expert”. After lesson eight, he admitted that, “It’s not always becoming a discussion, it’s often an answer from one PST followed by the ‘correct answer’ from me”. While Marcus continuously reflected on how to improve the discussion, this also made him feel vulnerable. After lesson seven, he reflected on the embodied and somewhat ambivalent experience of allowing PSTs to discuss his teaching, “I feel very exposed and really sense it in my body when it comes critical remarks, while I at the same time believe that this is educational for both me and the PSTs”.

Our analysis of the first university period show how Marcus’ internal struggles and negotiations – that is, his eager to teach perfectly, overly packed lessons, feelings of losing

control, sensing the PSTs frustration, feeling the need to teach the what, how and why, feeling vulnerable – created conditions where he started to question his ability as a teacher educator,

> Today's experience made me feel like a beginner. It was difficult to cope with the situations that occurred and I got a bad feeling inside me ... Here I'm going to be a good example of a teacher, and I can't even teach PSTs. How can I teach them how to teach when I don't feel confident? (Reflective diary, lesson five)

There was a striking difference in Marcus' internal negotiations between the first and second period. The struggles, negotiations and experiences throughout the first period created an environment in the second university period where he appeared as a more secure teacher educator. The initial university period allowed Marcus to develop his relationship with the PSTs. He also developed his familiarity with the student-centered model and felt that he had developed his notion of the teacher educator role. The focus on content was also in line with his former teaching practice. This enabled a flexibility to his practice in which it was easier for him to adapt to situations and make changes during lessons. Comparing the two periods, Marcus explained how these different aspects created conditions where he often experienced to be a confident teacher educator,

> I'm unsure whether it's because I teach in a more familiar environment [focus on content] or whether it's because I've become more confident in the role as teacher educator or if it's because I know the PST better, but I feel less stressed both before and during lessons. (Reflective diary, lesson twentytwo)

While Marcus experienced confidence in his practice, we noticed how his teaching appeared less different – that is, more similar to his previous established practice, similar to the program and course tradition and similar to PST expectations. This created conditions where he experienced not being able to engage PSTs in the student-centered model and the nature of teaching. He therefore constantly engaged in an internal negotiation based on these tensions. The following reflection show his internal conflicts of sensing the PSTs enthusiasm, however, not feeling able to teach about the model or articulate the nature of his teaching,

> I lost the focus on the student-centered model today. It's difficult to balance and change between teaching the games and the model elements ...While PSTs really enjoyed today's class, it's important that it's not only a lesson with physical activity but that I actually manage to articulate and promote the why and how of my teaching. (Reflective diary, lesson fourteen)

Discussion

Studying a teacher educators' learning and practice, the findings from this study suggest a different interpretation of the complexity of teacher education, one that attends to the whole and not pieces of teacher education pedagogy (Cochran-Smith et al., 2014). We contend that a conflux of human and non-human elements influence teacher educator learning and practice. By conceptualizing and analyzing the development of teacher education pedagogy as assemblage – that is, by examining the multiple human and non-human elements and consider how they work together to produce practice and learning – teacher education researchers can better understand the complex relationship between teaching about teaching and learning about teaching, and particularly the way non-human elements influence the relationship.

Extending the concept of 'assemblage' (Deleuze & Guattari, 1987; Strom & Martin, 2017) to this study, the mixture of elements in Marcus' two university periods can be considered teaching-assemblages, each functioning to construct particular practice and learning. The elements influencing Marcus' teaching-assemblage included Marcus himself (his eager to teach perfectly, level of familiarity with the student-centered model and teaching about teaching), the PSTs (their level of familiarity with the model, expecting a focus on content, used to experience mastery in physical education), the student-centered model (its multiple concrete teaching and learning features), the program and course tradition (no use of particular student-centered models and a sole focus on practicing content in practical courses), and the nature of teacher education pedagogy (an expectation to articulate the what, how and why of teaching). Considering the two university periods as teaching-assemblages allows for a more complex discussion of teacher educator practice and learning, and hence, the development of a pedagogy of teacher education.

A rhizomatics lens (Hultman & Lenz Taguchi, 2010) allows us to appreciate that the material world (e.g., student-centered models) and even the non-tangible (e.g., traditions), have the capacity to influence, and can shape, teacher educator practice and learning just as much as human actors (Strom & Martin, 2017). In Marcus' self-study, this is illustrated by the ways the program and module tradition, the nature of teacher education pedagogy and the student-centered model came into play and influenced Marcus' practice and learning, and the relationship between teaching and learning. For example, the program and course tradition created strong expectations towards the course content and Marcus' practice. Challenging the tradition to its limits in the first period created PST resistance and a vulnerable awareness in Marcus' practice. Negotiating with the tradition, Marcus and the PSTs agreed upon a lesson

structure that was more productive given the aim of the practice. However, the tradition increased its influence going into the second period, with PSTs expecting to learning about content. As a way to retain his evolving relationship with the PSTs in the second period, Marcus chose to adjust the content and his practice with respect to the tradition.

Using "assemblage" as an analytic construct may generate a more nuanced understanding of the different tensions in Marcus' practice, and a different consideration of the complex relationship between teaching about teaching and learning about teaching. In the beginning of the first university period, multiple elements worked constraining on Marcus' practice – for example, Marcus' limited experience of teaching about teaching, and his and the PSTs limited experience with the compressive student-centered model. Combined with Marcus' personality (i.e., eager to teach perfectly) and beliefs – resulting in him implementing multiple features of the student-centered model, using time explaining them to PSTs as prospective teachers, and require PSTs to use time on discussion – the mixture of elements worked together to produce a chaotic practice. The complexity overwhelmed Marcus: he became a stressed teacher educator who did not manage to clearly articulate the what, how and why of his practice. PSTs were unable to carry out the model responsibilities and developed a frustration towards Marcus' practice. This created a tense social dynamic between Marcus and the PSTs, working to constrain the relationship between teaching and learning.

From a rhizomatic perspective, when particular elements or conditions in the assemblage changes, the mixture of elements work together differently, co-constructing different practice and learning (Strom & Martin, 2017). Through multiple negotiating processes – that is, with himself through self-reflection and with the PSTs by interacting with them and displaying vulnerability – Marcus was able to identify some of the constraining elements influencing his practice. Combined with the evolving teaching and learning experiences, Marcus and the PSTs agreed about the lesson structure, while developing their understanding of the multiple features of the student-centered model. Together, this worked enabling for Marcus' practice, with him developing a meaningful relationship with the PSTs.

While the evolving experiences and relationships from the first period and PSTs' teaching experiences from school placement deepened the relationship between Marcus and the PSTs in the second period, multiple elements constrained Marcus' aim to articulate the what, how and why of teaching. The traditional content focus of the course, together with PSTs' evolving familiarity with the student-centered model, made them encourage Marcus to focus on content in the last period. Considering the amount of PST resistance throughout the

course as a whole, Marcus chose to align his practice with the PSTs' needs and concerns. This was also in line with Marcus' former established teaching practice. The combination of these elements and processes contributed to produce a pleasantness in the teaching and learning environment. In such a setting, Marcus became confident, however less persistent in his attempts to engage PSTs in meaningful practice about the nature of teaching.

Implications for teacher education policy and practice

We suggest two implications for teacher education pedagogy and teacher educator learning from the two main ideas articulated above. First, developing a pedagogy of teacher education is about understanding the complex interplay of human and non-human elements. Thus, while understanding the relationship between teaching *and* learning about teaching is important (Loughran, 2006), this study suggest that teacher educators needs to understand their teaching-assemblage and the way multiple human and non-human elements connect and interact in their practice. We argue that conceptualizing teaching and learning as assemblage provide teacher educators with a frame for exploring practice and a language for describing practice.

Second, the negotiation process occurring between the teacher educator, the PSTs, and the context, and the teaching and learning constructed by the collective negotiations, suggests that teacher educator learning and development is a complex, ongoing, non-linear process. The findings of this study suggest that Marcus was constantly "becoming-different" (Strom & Martin, 2017) in relation to the constellation of elements, forces and influences occurring in the classroom at any given time. Thus, we suggest that teacher educator learning and becoming a teacher educator is not merely about transferring from teacher to teacher educator, but a continuous process of changing in relation to context and people.

Conclusion

If teacher educator learning and teacher educator preparation is similarly complex as teaching and teacher learning, the teacher education researcher community needs to engage with frameworks that attend to the relational and nonlinear nature of teacher education practice. In this study, we used the concept of assemblage to understand the whole of a teacher educator's learning and practice. In this conceptualization, the teacher educator becomes only one of multiple elements co-constructing teacher education pedagogy within which the relationships between elements becomes more important than the elements themselves (Strom & Martin,

2017).

Acknowledging teacher education as complex means considering teacher educator learning and growth as an ongoing transformation that is non-linear, non-directional, and never quite actualized (Strom & Martin, 2017). Hence, while we strongly support initiatives to develop a formal education for teacher educators, these programs needs to focus on teacher educators as lifelong learners, as they are always "becoming different". In a mutually recursive circle, teacher educators can engage with the existing knowledge about the pedagogy of teacher education, carry out self-study research, and engage in continuous professional development.

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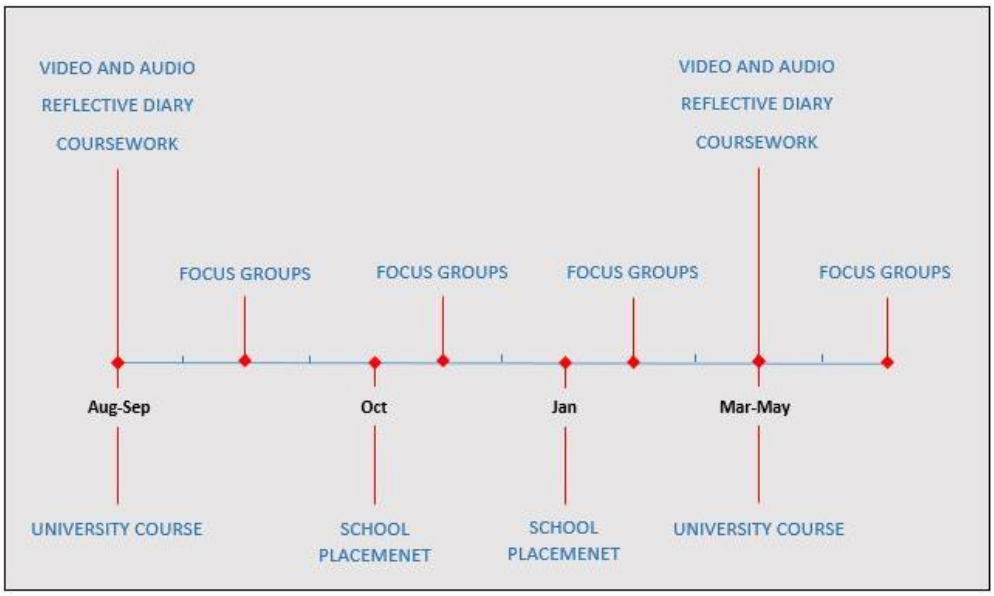

Figure 1. Empirical work of the study

Study IV

Hordvik, M., MacPhail, A., & Ronglan, L. T. (Under review, submitted January 3, 2018). Encountering the reality of teaching Sport Education: The experiences of pre-service teachers while on school placement. *Physical Education and Sport Pedagogy*.

Encountering the reality of teaching Sport Education: The experiences of pre-service teachers while on school placement

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Summary for practitioners:

The objective of this study was to investigate pre-services teachers' experiences of teaching Sport Education (SE) in diverse school contexts. The study was guided by the question, 'Given common experiences of a university module, how do pre-service teachers negotiate their SE learning experience during school placement?' This study involved twenty-one pre-service teachers undertaking their school placement as part of a three-year physical education teacher education program in Norway. We collected pre-service teacher coursework and conducted focus groups with each of the three pre-service teacher teams before, during and after school placement. Findings conveyed how multiple elements such as the pre-service teacher (belief in and familiarity with SE, background), students (their maturity level, experience with SE, attendance), SE features (stable teams, roles and student responsibility), and context (negative cooperating teacher, facilities, class size) influenced pre-service teachers' experiences and described practices. We encourage for a more complex conceptualization of teaching SE.

Abstract:

Background and purpose: Acknowledging the complexity of Sport Education (SE), the diverse pre-service teacher (PST) experiences of teaching SE, and that it is critical that researchers design and implement studies that examine teaching as a complex phenomenon [Strom, K., & Martin, A. D. (2017). *Becoming-teacher: A rhizomatic look at first-year teaching*. Rotterdam, The Netherlands: Sense Publishers], the objective of this study was to investigate PSTs' experiences of teaching SE in diverse school contexts. Using the rhizomatic [Deleuze, G., & Guattari, F. (1987). A thousand plateaus: Capitalism and schizophrenia. Minneapolis, MN: University of Minnesota Press] concept of assemblage, this study was guided by the question, 'Given common experiences of a university module, how do PSTs negotiate their SE learning experience during school placement?'

Research setting and participants: This study involved twenty-one PSTs undertaking their school placement as part of a three-year physical education teacher education (PETE) program in Norway. School placement was composed of two three-week periods in upper secondary school in which the PSTs taught SE in the same class each week. The PSTs participated in a university SE-PETE unit prior to school placement.

Data collection and analysis: We conducted three focus groups with each of the three PST teams: (i) end of the SE-PETE unit and prior to school placement; (ii) in between school placement blocks; and, (iii) end of school placement. Also, PST coursework (completed in groups) was collected on completion of the PETE unit and on completion of school placement (individual coursework). We analyzed the data employing traditional qualitative analytic conventions (such as coding) with situational analysis [Clarke, A. E. (2003). Situational analyses: Grounded theory mapping after the postmodern turn. Symbolic Interaction, 26(4), 553-576] and rhizomatic mapping [Deleuze, G., & Guattari, F. (1987). *A thousand plateaus: Capitalism and schizophrenia*. Minneapolis, MN: University of Minnesota Press].

Findings: The PSTs participated in the same SE-PETE module and each PST team had developed a SE season design template. Regardless of such commonalities, the PSTs' experiences and described practices were strikingly different. We contend that key differences between the PSTs themselves (e.g., belief in and familiarity with SE, background), their students (e.g., their maturity level, experience with SE, attendance), the SE features (e.g., stable teams, roles and student responsibility), and their contexts (e.g., negative cooperating

teacher, facilities, class size) and the ways the unique set of elements comprising each class interacted, help explain the different PSTs' experiences and practices.

Conclusion: We suggest that non-linear conceptual and methodologic frameworks, such as those featured in this study, can assist the PETE community to push beyond linear and simple ways of studying SE practice and instead encourage more complex conceptualizations of teaching SE. Hence, we advocate for an ontological turn [Lather, P., & St. Pierre, E. A. (2013). Post-qualitative research. *International Journal of Qualitative Studies in Education, 26*(6), 629-633] in PETE research that focus on the processes of teaching and learning (curriculum and instructional models), rather than the outcomes alone.

Keywords: Deleuze, physical education teacher education, qualitative research, rhizomatic

Introduction

Sport Education (SE) is a well established curriculum and instructional model (Siedentop, 1994; Siedentop, Hastie, & Van Der Mars, 2011) with research reporting positive findings for student learning and motivation (Hastie, de Ojeda, & Luquin, 2011; Wallhead & O'Sullivan, 2005). Teachers' effective enactment of SE influences student learning, and research has recognized that teachers and pre-service teachers (PSTs) deliver SE in one of three ways (Curtner-Smith, Hastie, & Kinchin, 2008); (i) 'full version' that is consistent with the recommendations and guidelines provided by Siedentop (1994) and his colleagues (Siedentop, Hastie, & Van Der Mars, 2011); (ii) a 'watered down' version where some parts of the 'full version' are omitted, and (iii) a 'cafeteria approach' that involve traditional sporting units where particular facets of SE are the sole focus.

While intended learning is most likely to develop if students are taught in line with the SE recommendations (Siedentop et al., 2011), teachers, and in particular PSTs and beginning teachers, have encountered a range of challenges when teaching SE (e.g., Deenihan & MacPhail, 2017; McCaughtry, Sofo, Rovegno, & Curtner-Smith, 2004; McMahon & MacPhail, 2007). It has been suggested that it is unreasonable to expect PSTs to teach SE aligned with all the recommendations and guidelines (Deenihan & MacPhail, 2017) and that subsequently researchers are encouraged to conduct studies that explore the realities, not ideals, of teaching the model (Deenihan & MacPhail, 2013, 2017). Acknowledging this, and the complexity of the model itself (Hordvik, MacPhail, & Ronglan, 2017b), the objective of this study was to examine PSTs' experience of teaching SE in diverse school contexts.

There is a growing body of research (Britzman, 2003; Davis & Sumara, 1997; Opfer & Pedder, 2011; Strom, 2015) that attests to the complex, non-linear nature of teacher learning and practice. Strom and Martin (2016) asserted that PST learning does not directly transfer into classroom practices and suggest that multiple enabling and constraining elements influence the pedagogical decision-making and the enactment of teaching practices. Furthermore, Strom (2015) argued that researchers must focus on the process(es) of teaching rather than the outcomes alone. Acknowledging our previous engagement in utilizing a theoretical lens to examine the complexity of teaching SE (Hordvik et al., 2017b), in this study we used 'rhizomatics' (Deleuze & Guattari, 1987), a theoretical lens that emphasizes interrelationships among a multitude of interacting variables in a given social situation to investigate the complexity of teaching SE during school placement.

This study can be envisaged as contributing to the 'chain of evidence' (Cochran-

Smith, 2005) concerned with empirical evidence demonstrating the link (or lack of link) between teacher education programs and PSTs' learning and their subsequent teaching during school placement. We work to the premise that enacting a curriculum and instructional model learned in teacher education is a complex undertaking shaped by the ways the elements in the school setting work together. In doing so, we hope to contribute to the debate about the normative practice of using curriculum and instructional models (Landi, Fitzpatrick, & McGlashan, 2016). Our contribution advocates for a shift toward a more complex conceptualization of teaching and learning curriculum and instructional models.

Conceptual framework

'Rhizomatics' (Deleuze & Guattari, 1987) is a non-linear theory of thinking and social activity, that is deemed a helpful tool for explaining the complexities of enacting pedagogical change at the micro-level of the teacher and classroom (Strom, 2015). The 'rhizome' is central to the rhizomatics, and Deleuze and Guattari (1987) contrasted the rhizome with the Western thought that they termed the 'tree logic'. While the rhizome is a bulb that grows unpredictably in all directions, the rigid tree is stable, hierarchical and affirms linear thinking. Rhizomatics focus on processes rather than products, and allows us to consider interaction and interplay between multitudes of elements. While we acknowledge the difficulty of considering one rhizomatic concept without considering others (St. Pierre, 2016), for the purpose and scope of this paper, our main focus is on the concept of assemblage.

'Assemblage' is one of numerous rhizomatic concepts that can be used as analytic tools to think differently about social activity, allowing for the consideration of teaching and learning as complex and contextually situated phenomena (Strom & Martin, 2017). An assemblage is an 'aggregate of elements, both human and non-human, that function collectively in a contextual unique manner to produce something (e.g., teaching practice, a situated identity)' (Strom & Martin, 2017, 7). A classroom is an assemblage, composed of PSTs (their knowledge, experiences, and beliefs), the students (their knowledge, experiences, beliefs, and investments), the physical space (the sport hall, equipment, the room environment), and discourses (the teacher's expectations about the students and vice-versa) (De Freitas, 2012, 562). Considering teaching as assemblage means considering the various components of the classroom—the PSTs, the students, the content, the classroom, and so on—as 'working collectively to shape teaching practices, rather than viewing them as discrete variables that are independent of one another' (Strom, 2015, 322). The concept of assemblage allows us to consider the PSTs as only one element contributing to their practice. In this study

we use the concept of assemblage to analyze the multitude of elements influencing PSTs' experiences of SE during school placement.

Elements influencing PSTs' teaching of SE during school placement

A considerable amount of research on PSTs teaching SE is available. Researchers have suggested that various conditions or elements related to the teacher (i.e., PST), the classroom, the school, the district, and the larger policy contexts influence the experiences and practices of PSTs. In the next section, we discuss the ways in which these elements combine and interact, and influence PSTs' experiences and practices in varying and sometimes unpredictable ways.

The Sport Education model

The various teaching and learning features of SE have the potential to shape PSTs' experience and teaching of SE. PSTs have reported that delivering SE increased the planning and workload requirements (Braga & Liversedge, 2017; Deenihan & MacPhail, 2013, 2017; McCaughtry et al., 2004). While the detail of SE has made PSTs feel overwhelmed (McCaughtry et al., 2004), others have reported that the model structure (particularly the elements of teams and team affiliation, roles and competition) aided the effective teaching of SE (Braga & Liversedge, 2017; Stran, Sinelnikov, & Woodruff, 2012). It has been suggested that SE has the potential to break the cycle of non-teaching (Curtner-Smith & Sofo, 2004; Stran & Curtner-Smith, 2009a) and provide an effective medium through which PSTs can explore and consider different perspectives (Stran & Curtner-Smith, 2009b). While utilization of SE appears to facilitate a more autonomy-supportive social context within instructional practices (Perlman, 2012), it has also been suggested that SE's aim of providing authentic sporting experiences reinforces and creates an ego-involving climate (Parker & Curtner-Smith, 2014). The SE features have also been suggested to challenge a conservative school culture whereby the teacher acts more as a facilitator than dictator in the learning environment (McMahon & MacPhail, 2007).

The pre-service teacher

The PST brings to teaching many elements that shape their teaching of SE. Pre-service teachers' occupational socialization influences practice (Curtner-Smith et al., 2008; Stran & Curtner-Smith, 2009a) and consequently PSTs teach differing versions of SE as alluded to

earlier in this paper. Pre-service teachers' knowledge influences their SE teaching (Stran & Curtner-Smith, 2010), with PSTs gradually developing their knowledge and understanding about teaching and learning SE (Glotova & Hastie, 2014; Hordvik, MacPhail, & Ronglan, 2017a).

While researchers have reported PSTs' enjoyment of teaching SE (Deenihan & MacPhail, 2013), PSTs tend to experience multiple struggles and misunderstandings with SE. They have struggled with tactical instruction (McCaughtry et al., 2004), expressed organization concerns (Curtner-Smith & Sofo, 2004) and conveyed an unwillingness to move away from a reliance on teacher-led instruction (Stran et al., 2012). PSTs have misunderstood and underestimated both the complexity of skill development (e.g., repetitive drills that focused on only isolated skills) (McCaughtry et al., 2004), and the teaching of roles and responsibilities (McMahon & MacPhail, 2007).

PSTs have been reported to reinforce traditional gender roles and expectations in teaching SE (Parker & Curtner-Smith, 2012), while other have been able to combat masculine bias and sexism due to their liberal views about sport, willingness to confront the prevailing sporting culture and the fact that they taught elementary aged children (Chen & Curtner-Smith, 2015). It has been suggest that an overemphasis from the PSTs on the competitive elements of SE created an ego-involving climate (Parker & Curtner-Smith, 2014).

The classroom environment

While PSTs have noted student enjoyment through their teaching of SE (Curtner-Smith & Sofo, 2004), they have experienced student challenges that have constrained their teaching of SE. The culture of the class has been suggested to constrain PSTs' SE delivery (Stran et al., 2012) with evidence that PSTs experienced student resistance towards roles and responsibility and other features (such as record keeping, statistics and match reports) because students were not used to these ways of engaging in learning (Curtner-Smith & Sofo, 2004; McMahon & MacPhail, 2007; Stran et al., 2012). More generic issues related to teaching such as low student attendance (Stran et al., 2012), range of student skill level (Braga & Liversedge, 2017) and students not bringing the correct attire to school to participate in physical education (Deenihan & MacPhail, 2013) have all been noted as further challenges to the effective delivery of SE.

The PETE and school context

The quality of physical education teacher education (PETE) programs influences PSTs' delivery of SE (Curtner-Smith et al., 2008; Stran & Curtner-Smith, 2010). While PSTs' PETE experiences can facilitate their teaching of SE (Braga & Liversedge, 2017; Deenihan & MacPhail, 2013), being assessed on their teaching while undertaking school placement can lead to a concern from PSTs on 'experimenting' with SE (Deenihan & MacPhail, 2017). PSTs who were teaching in a custodial school environment were inhibited in their delivery of SE (Deenihan & MacPhail, 2017), while supportive structures in the physical education department and in the wider school community worked towards facilitating the teaching of SE (Deenihan & MacPhail, 2013).

While some cooperating teachers encouraged and supported PSTs to deliver SE while undertaking school placement, others encouraged PSTs not to deliver SE (Deenihan & MacPhail, 2013, 2017). This latter point may well be associated to cooperating teachers being unfamiliar with particular curriculum and instructional models (Deenihan & MacPhail, 2017).

Aim and purpose

We acknowledge the complexity of SE, the diverse PST experiences of teaching SE, and that it is critical that researchers design and implement studies that examine teaching as a complex phenomenon (Strom & Martin, 2017). Consequently, the objective of this study was to investigate PSTs' experiences of teaching SE in diverse school contexts. The study was guided by the question, 'Given common experiences of a university module, how do PSTs negotiate their SE learning experience during school placement?'

Method

Participants and setting

This study involved twenty-one PSTs (six females, fifteen males) who were in their final year of a three-year undergraduate PETE program in a university in Norway. While the PSTs were aged between 20 and 29 years old, sixteen of them entered the PETE program one or two years from completing their post-primary education. In Norway, curriculum and instructional models are not part of the physical education and teacher education curriculum. The PSTs had not experienced SE or other models as school students, while the PETE program and its modules were not based around curriculum and instructional models. The goals of the established modules where PSTs were now to learn about SE had focused on learning the

content of, and how to teach, games, while school placement was not specifically directed towards encouraging the use of particular curriculum and instructional models.

SE-PETE experience

All PSTs experienced a SE practical games unit prior to school placement, with six PSTs having previously experienced a SE practical team handball unit the year before (Hordvik et al., 2017b) and three of the PSTs having taught SE in a consecutive school placement. During the SE games unit, PSTs experienced a SE season as if they were a school student, selected and affiliated to teams, adopted roles and experienced formal competition and culminating events. They were required to reflect and discuss the 'how' and 'why' of teaching SE. The unit consisted of two connected mini seasons of Touch Rugby (lessons 1-7) and team handball (lessons 8-13). The PSTs were formally assessed in week 13 on the basis of a SE team portfolio where they were to produce a SE season design that would inform their teaching of SE during school placement.

School placement

The school placement was composed of two three-week periods in upper secondary school. PSTs were divided into pairs, assigned an urban or suburban post-primary school, and were appointed a school cooperating teacher. Each week the PSTs were required to teach and actively observe their peer a minimum of eight hours, and with an additional six hours shared supervision with their cooperating teachers. This study focuses particularly on the one class each week where PSTs taught SE, although due to unpredicted school events some PSTs never got to teach the maximum six-week complement of lessons.

Data collection

Ethical approval for the study was granted from the Norwegian Social Science Data Services and each PST signed a study consent form. Data collection employed nine focus groups in addition to PST individual and team coursework. We conducted three focus groups with each of the three PST teams: (i) end of the SE-PETE unit and prior to school placement; (ii) in between school placement blocks; and, (iii) end of school placement. Also, PST coursework (completed in groups) was collected on completion of the PETE unit and on completion of school placement (individual coursework). This allowed us to map the PSTs' expectations, experience and perception of the school placement. The group coursework (i.e., a comprehensive plan for how to teach SE) was collected on completion of the PETE course,

while the individual coursework (i.e., teaching philosophy, expectations of teaching SE, after class reflection and end of each period reflection) was collected on completion of the school placement.

Data analysis

Drawing on the analytic work of Strom (2014, 2015), we analyzed the data employing traditional qualitative analytic conventions (such as coding) with situational analysis (a postmodern form of grounded theory) (Clarke, 2003) and rhizomatic mapping (Deleuze & Guattari, 1987) (a methodology based on the properties of the rhizome). The nonlinear analysis process included data walking, rhizomatic mapping, situational analysis, and memo writing.

The first level in creating rhizomatic maps involved a strategy of 'data walking' (Strom, 2014; Waterhouse, 2011), an inductive approach to exploring the data. This process involved reading the focus groups and coursework multiple times, while highlighting sections of interest and noting connections between the data and the theoretical literature, the empirical literature, and other data sources. Our focus in walking through the data was on connections, interactions, and processes rather than categories.

We used the data software Inspiration to create rhizomatic maps that are flexible and show multidirectional relationships among elements (Strom, 2015). We created one map for the PST school placement. We entered the main ideas from the initial coding process into the map, creating expandable 'bubbles' to capture each idea. We then began clustering these data bubbles together in ways that related to the facets of constructing practice, such as 'negotiating with SE', 'constraining conditions', and 'negotiating with students'. Rather than reducing the data to a category word or phrase, this method kept us immersed in the detail and complexity of the data (MacLure, 2013).

We used situational analysis to create organized situational charts which named 'who and what' matter in school placement, including the major human and non-human elements present (Clarke, 2003). We then theorized the lines we had drawn or the connections made within the rhizomatic map. We considered these as the social negotiations within school placement, that is, the relations and interactions between important elements that shaped PSTs' ongoing teaching practices. We employed a process of analytic memoing (Charmaz, 2006) that involved writing analytic memos from the rhizomatic map and situational analysis, developing the main ideas in more detail and creating lengthier descriptions of events to re-situate the data. These memos helped us make sense of the multiple elements in the classroom

and school setting, as well as the ways the resulting linkages shaped PSTs' experiences and teaching practices.

Findings

The PSTs participated in the same SE-PETE module and each PST team had developed a SE season design template. Regardless of such commonalities, the PSTs' experiences and described practices were strikingly different. Some PSTs were able to successfully enact the key ideas from SE and their corresponding template, including students allocated to stable teams, providing students with roles and an appreciation of responsibility for own learning, and carrying out a festive culminating event. In contrast, other PSTs struggled to allocate students to stable teams and refrained from introducing defined roles. We contend that key differences between the PSTs themselves, their contexts, their students, the features of SE and the ways the unique set of elements comprising each class interacted, or 'came into composition', help explain the different PSTs' experiences and practices.

In developing insights into the differences, we present each of the contributing elements in turn.

Pre-service teacher characteristics

While PSTs had one or two SE university learning experiences, only three PSTs had experience of previously teaching SE. PSTs expressed different expectations of teaching SE. While some were confident and believed students would respond well to the features of SE, others were skeptical and in particular nervous about providing students with increased responsibility. The SE features (e.g., stable teams and multiple roles) represented a contrast to their experiences as physical education school students and their former PETE experiences. PSTs also differed in their beliefs about learning processes. PSTs believed that the effective enactment of SE was reliant on the particular makeup of individual classes, something that was reinforced for some of them in school placement. Others believed that regardless of class context there were particular features of SE that could be effectively enacted. Relating to this, PSTs also differed in their beliefs about the way SE would 'work' in school. They were especially conscious about the influence of students. After experience in teaching SE, some PSTs blamed students for not being able to take on their role responsibilities, while others acknowledged that they themselves could afford to change their teaching and adjust it to students' needs. Michael reflected on his responsibility for student learning,

> I'm disappointed with the choice I made with the instruction of duty roles. I had not planned enough time for [student] learning. I should have had more instruction and showed examples of how they could do it. In addition, I misunderstood the amount of information that students could absorb at the same time... It is important to emphasize that I am not trying to blame the students. (Individual coursework)

Different contextual influences

PSTs faced both expected and unexpected contextual challenges. Before starting their school placement, PSTs were encouraged to contact their cooperating teachers and gain information about their SE class and the facilities at the school. Some PSTs experienced having an entire team handball court at their disposal, others had one-third of a team handball court, and others had one or two small gymnasium. For example, Scott had two separated small sport halls. In the first SE lesson, he decided to use only one of them because he considered it important to have an overview of each team at the same time. In evaluating this preference, he felt it became too difficult for students to operate effectively in the collective space and decided to use both sports halls for the rest of the season. He noted that a consequence of this was that he lost intimate contact with the teams. As for equipment, PSTs had access to some form of handballs (ranging in size and numbers) while all, except one, had access to some form of goals (e.g., team handball, different sizes of floorball). To handle the challenge of having no or poor goals, two of the PSTs used duct tape on the wall to mark goals, 'It worked quite well. However, the balls jumped all over the place' (Jack, second focus group).

PSTs acknowledged the limitation of having six SE lessons divided into two periods (before and after Christmas). PSTs pointed out that while the short season forced them to focus intensely on the elements of SE, it compromised the development of relationships with students. Due to the extensive time between the two periods, PSTs expected, with numerous also experiencing, that students needed reminding about the centrality of teams and associated roles. As a way of addressing this, they deliberately tried to 'freshen up students' memory'. In the first lesson of the second period, the PSTs reported that they repeated a lot of the focus from the first lesson (e.g., team names, roles, team cheers, and the rules of the game), while some also used a SE Facebook page or It's Learning (online interactive platform) to remind students about SE and their role responsibilities.

Numerous unexpected contextual challenges arose, resulting in PSTs not being able to deliver the expected full complement of six SE lessons. Many of them also had to face different challenges directly in the classroom, including preparing for a class to take place in

the sports hall and then being notified at the last minute that the class was being moved to another venue. Others experienced different grades and/or educational programs coming together for physical education. Simon had to accommodate two classes at the same time, and without getting any information beforehand, he experienced that half the class was in job practice the first lesson and the other half the next lesson. He explained,

> Half of the class was attending the first lesson and not everyone was wearing their PE clothes. But I think it went very well ... And then in the next lesson when I got into the sports hall and was ready [to begin the lesson] I found out that I was having the other half. Because then they [the first half] were in practice again and I got the other half. I had to make some drastic changes, and no one had their PE gear and I mean absolutely no one ... They are third grade and the first group is first grade. (Simon, second focus group)

Cooperating teachers played an important role in the PSTs' school placement experience. As the example above and other examples convey, not all cooperating teachers were effective at providing PSTs with sufficient information about different class challenges. Cooperating teachers limited knowledge or experience with SE did not allow them to be overly conscious about challenges that may arise in class that would affect the delivery of SE. Furthermore, because of the traditional approach to teaching physical education in Norway, the SE features were likely to represent a contrast to cooperating teachers' regular teaching practices. Some of the PSTs believed that cooperating teachers had chosen classes they cared less about in terms of physical education outcomes as those for PSTs to teach SE in. This reinforced a number of PSTs' beliefs that SE was not suitable for all classes. Marvin described his cooperating teachers' view,

> [Critical to] the whole package. He says he can understand the principles, and also think it may work very well in a sports class, but struggles to see that it could work in a general education class... Initially he was very critical of it, but that it would be exciting to see it. However, he still seems negative to it. (Second focus group)

Student aspects

Student characteristics played an important role for PSTs' SE experiences. Students had never experienced a SE season and, because of the tradition of physical education teaching in Norway, it is feasible to consider they were used to a teacher-centered approach. While some classes had many skilled students, PSTs reported that many students had no or limited skills

and knowledge of team handball. Dividing students into teams, PSTs were conscious of trying to have at least one skilled player in each team. However, this became difficult for some due to high student absenteeism.

PSTs' problematized that they were teacher substitutes only for a short period of time, making it difficult to develop relationship with students and gain the respect needed to carry out a different approach to physical education. As Adrian explained, 'When you are thrown to the wolves as we were, the odds are low that it will play out perfectly' (Third focus group). The lack of relationship and respect can be one reason for the difficulties several of the PSTs experienced with one or more students. For example, Mary experienced students wanting to switch between teams because they did not get along with other members on the team. Other PSTs experienced students not participated in the lesson due to injuries or other matters (e.g., not bringing physical education attire). Several of the PSTs used roles to engage these students in the lesson. Caroline highlighted this as a positive aspect of her SE teaching, 'What worked the best for me was to give concrete tasks to those who were not physically participating in the class. I focused on giving them tasks that required them to actively engage' (Individual coursework).

PSTs also experienced students responding differently to the SE features of working in stable teams and being responsible for their own learning (e.g., having a role other than that of a player). PSTs reported different student engagement and ability to carry out role responsibility. For example, Kaley experienced that students did not understand the purpose of having roles and refrained from paying much attention when she explained the purpose of having roles before having them identify preferred roles. Hence, the PST received a lot of questions in the second lesson and felt the need to repeat the purpose of teams and roles. Sandy experienced engaged students who appreciated the affiliation aspects (e.g., making team names and team cheer) as well as having responsibility for their own learning. He explained that teams assembled and performed their cheer at the beginning of lessons, and that every student took part in (and was responsible for) one of three roles (manger, head coach and captain), while responding well when their peer was leading (e.g., manager responsible for team warm up).

Sport Education features

PSTs used a significant amount of time at the beginning of the first lesson to explain the essence of SE (e.g., stable teams, roles other than that of a player, matches, and culminating event) before dividing students into teams and allowing them to allocate the roles they had

decided on. PSTs used the season design they had developed as part of their team portfolio to differing degrees. Many of them who explicitly followed the template plan felt strained by the model, with Mary stating that she felt the model constrained her from experimenting with different teaching approaches. Ferdinand was overwhelmed and stated, 'I think the whole thing [SE] can become too powerful for both teachers and students, if the model is followed slavishly. I became stressed'. Other PSTs reported that the SE teaching and learning features facilitated an improvement in their teaching. Calvin explained how SE helped improve aspects of his teaching that he previously had difficulty with,

> I get a lot of time to follow up each student to a large extent and give feedback. I can observe students in smaller groups where I can see them clearer, and that provides me good opportunities to assess. I feel that I to a greater extent can guide and evaluate students... and come closer to students. (Individual coursework)

While PSTs modified SE in their season plan, coursework and focus groups conveyed that PSTs further modified their SE teaching to different degrees. While PSTs made various modifications, they all continued, at least to some degree, to use teams and roles. Beatrix expressed satisfaction with how she and the other PST on her team had modified their SE teaching,

> We had already modified SE from what we had here [at the university], and made it a lot easier in the coursework. Everyone here [in the PST team] had a similar plan, but all modified according to the prerequisites. We have done that from the warm up of the first lesson ... [and continued] to change our plan. Everyone has changed based on the class we've had ... So well done everyone... We have changed that and that, and not stayed with what we had planned. We have made changes considering the needs of the class. It has worked for us, but we have done a lot of changes to make it work. (Third focus group)

Discussion

The findings of this study support the claim that there are a multitude of challenges that PSTs are expected to meet when teaching SE (Deenihan & MacPhail, 2017) and suggests a more complex analysis of teaching SE. We argue for examining the conflux of elements present in the settings where PSTs teach SE and analyze the ways those elements work together to shape experiences and practices (that is, by conceptualizing and analyzing teaching as assemblage).

This way, PETE researchers may help advance the teacher education field's understanding of PSTs' teaching as continually transforming in relation to the PSTs' own experiences, their students, the classroom and school context (Strom, 2015). This, in turn, will help the PETE community better grasp the complex relationship between PST SE learning and how that learning is enacted (or not) in classrooms.

Assemblages are collectives of elements that work together for a particular purpose (Strom & Martin, 2017). Extending this concept to the PSTs' school placement, the conflux of elements in their SE classes can be considered teaching-assemblages, each of which operated to construct particular teaching experiences and practices. The elements present in the assemblages included aspects of the PST (e.g., PST's belief in and familiarity with SE, his/her background), students (e.g., their maturity level, experience with SE or other student-centered approaches, attendance), SE features (e.g., stable teams, roles and student responsibility, competition), and context (e.g., SE not specified in the curriculum, negative cooperating teacher, facilities, class size, number of lessons). Considering each of the PSTs' SE classes as their own teaching-assemblages (in other words, as mixtures of PST, students, classroom, school, and program elements) allows for a more complex discussion of teaching SE. Such a discussion recognizes experiences and practice as co-constructed by a multitude of influences rather than a set of actions fully controlled by the PST (Strom & Martin, 2017).

Teaching and learning SE in a university PETE course is different from teaching and learning SE in school. While it seems complex to teach SE in PETE (Hordvik et al., 2017b), teachers and PSTs encounter a host of challenges when teaching SE in school. This study further supports the complexity of teaching SE in school, and particularly for PSTs. The main idea articulated above is that PSTs and their university PETE learning is only one of many elements influencing their SE teaching within which PSTs continuously negotiate their teaching and learning. From this main idea we draw two important and interrelated implications for PETE practice.

First, the teaching and learning features of SE will most likely be taught in modified forms during school placement. Thus, the normative labeling of teachers' and PSTs' *delivery* of the full version of SE, or the *transfer* of the spirit of Siedentop and colleagues (Siedentop et al., 2011) and all the model features from a university PETE course into classroom *application*, seems highly unlikely (Deenihan & MacPhail, 2017). Instead, 'translating' may be a more productive concept in discussing teachers' and PSTs' teaching of SE in schools. Although the concept of 'translating' has recently been used in the teacher education literature with respect to pre-professional learning (Strom, 2015; Strom & Martin, 2016, 2017), we

suggest that this concept can be used in PETE with respect to teaching SE and other curriculum and instructional models.

In 'translating', as highlighted by the PSTs in this study, new teachers and PSTs make sense of their PETE learning within a specific setting and a set of circumstances. This may mean that teaching in school, that is produced by a joint sense-making, may look substantially different from one context to the next. This does not mean that the PSTs (their background, beliefs, PETE learning) possess no influence on the SE teaching practice. Rather, their teaching and learning are continuously transformed as it comes into composition with multiple contextual elements and conditions.

Second, if teaching is a collectively negotiating process within which PSTs and teachers need to translate their PETE learning into classroom teaching, the PETE community need to acknowledge this complexity and the relational aspects of teaching and learning. Hence, teacher educators should give attention to, and discuss, (i) the collective of elements that influence teaching and allow for activities that highlight the agency of students, cooperating teachers and other actors in the setting, (ii) the power of history and culture of the context, and (iii) the role of non-human and material elements such as the SE model and school equipment.

For example, teacher educators can engage PSTs in a advocated inquiry cycle (Klein, Taylor, Onore, Strom, & Abrams, 2016) where PSTs co-construct new understandings about SE with their peers and teacher educator, enact that learning in school placement, and return to their class to discuss, reflect, and problematize their school SE experiences as well as their own learning about theory-practice. As a way to facilitate such a recursive cycle of theorizing, practicing, and reflecting, teacher educators can connect PST coursework to the learning process. PSTs can develop a SE season design in the PETE course and during school placement PSTs modify and translate the season design and their PETE learning into the classroom. After lessons or at the end of school placement, PSTs could engage in reflection to identify all elements (both human and nonhuman) that influenced their teaching, the way they negotiated them and how these elements influenced their intended practice. In the second period of the PETE course, PSTs and the teacher educator could engage in reflection and discussion about the multiple forces that influenced the practice, and the ways they negotiated and were required to modify their teaching.

Conclusion

The aim of this study was to initiate the discussion about the normative practice of curriculum and instructional models (Landi et al., 2016). Our reflection is that much of the current literature on curriculum and instructional models, and in particular SE, focus on the outcomes of teaching and learning. We contend that a multitude of elements influence PSTs teaching of SE in school placement. As a way to account for the relational and complex nature of teaching and learning in physical education (teacher education), non-linear conceptual and methodologic frameworks, such as those featured in this study, can move the focus from outcomes to the processes of teaching. For example, in this study, we used the concept of assemblage to highlight the relational and collectively produced nature of PSTs' SE experiences and practices. We suggest that such ideas and concepts can assist the PETE community to push beyond linear ways of studying SE practice and instead encourage more complex conceptualizations of teaching SE. Hence, following the encouragement of Strom (2015) regarding teacher education in general, we advocate for an *ontological turn* (Lather & St. Pierre, 2013) in PETE research that focus on the process(es) of teaching and learning (curriculum and instructional models), rather than the outcomes alone. By focusing on the 'how' of teaching, we can examine the non-linear nature of teaching. Rich qualitative studies (e.g. longitudinal studies, interviews with various actors, observation of multiple practices) that account for the complexity of classroom teaching and learning is therefore highly encouraged.

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Study V

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Decentering the 'self' in self-study of professional practices: A working assemblage

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Introduction

Self-study of professional practices is a methodology that would appear to explicitly center the self as a central tenet of doing this form of research. That is, it is a form of inquiry in which it is the self who is the researcher, it is the self who is producing knowledge of practice while simultaneously enacting that practice (Ovens & Fletcher, 2014). While the explicit labeling of self in the methodology often distract researchers, it is not the self but '*the self and the other in practice* that is of most interest' (Pinnegar & Hamilton, 2009, p. 12). This encourages self-study researchers to enter into relationships and interacting with other humans, both in practice and in the process of constructing knowledge of practice (Pinnegar & Hamilton, 2009). Therefore, relationality is the central tenet of framing the self in self-study of professional practices. Attention shifts away from the individual self towards the constitutive nature of the interdependent connections between self and other in the production of and knowledge about practice (Ovens & Fletcher, 2014, p. 8). Practice then, is understood as inherently social and emerging 'as ways of managing the diversely interconnected elements in each setting' (Ovens & Fletcher, 2014, p. 8) and refers to all the activities in which someone engages as part of a particular profession (e.g., teaching and researching) (Pinnegar and Hamilton, 2009).

In this chapter, we consider the relational nature of self in the self-study of professional practices. The aim is to deliberately reframe the self and the relationship between the self and the other in the self-study methodology. By drawing insights from Deleuze and Guattari's (1987) philosophy – that encourages a thinking of relationships among a multitude of interacting elements in a given social situation – we focus on how self can be conceptualized in ways that do not equate self with an essentialized or ego-centric 'I'. In particular, we examine the multiple selves in play within our research assemblage formed to produce Mats' PhD study. That is, we draw attention to the ways multiple human *and* nonhuman elements functioned collectively to decenter the researcher-self within a self-study of the researcher's practice. We hope that such an approach provokes the reader to reconceptualize their understanding of self in self-study of professional practices and the process of dialogue as the way of constructing knowledge in the methodology. Given that Deleuze and Guattari (1987) prompt us to ask questions about context, function, and

production, the objective was to engage with the research assemblage to investigate its function and production. Contrary to searching for steps that can provide a description or manual to decenter the self in self-study, we seek to understand how the constellation of elements comprising the research assemblage combined and interacted in multiple processes of decentering the researcher-self.

In developing our case, we first explore three aspects that mark the nature of self-study of professional practices. Second, we elaborate on Deleuze and Guattari's (1987) philosophy with special attention to the concept of assemblage. Third, we provide the context of Mats PhD study, before describing the way we generated data and how we used the concept of assemblage to understand the data. Fourth, to show how assemblage worked in producing the PhD study, we explore two critical moments. Last, we discuss practical and methodological implications.

The nature of self-study of professional practices

According to Pinnegar and Hamilton (2009), three aspects mark the work of self-study of professional practices. First, self-study researchers' claims that trustworthiness are based in ontology rather than epistemology. That is, the aim of self-study is to understand and improve practice through careful articulation of what is in practice, rather than establishing foundational claims to know. Hence, self-study researchers do not strive for generalizability, they base their work in a relational ontological stance. Slife (2004) explain that in relational ontology,

> what is ontologically real and has being in practice cannot be understood apart from its relations to other aspects of the context. Indeed, practices do not exist, in an important ontological sense, except in relation to the concrete and particular situations and cultures that give rise to them (p. 158).

While embracing a relational ontology, self-study research is also based in 'awareness of the epistemology that underlies it (where knowledge has multiplicity and is socially constructed) – a space between ontology and epistemology' (Hamilton & Pinnegar, 2015, p. 132). In this space, knowing is partial and emerges in the research process within which the task of the researcher is to consider the different perspectives and interpretations throughout the process (Hamilton & Pinnegar, 2015).

Second, the coming-to-know is empirically grounded in a process of dialogue rather than the scientific method. That is, instead of following systematic and prescribed procedures that guide the research, self-study researchers engage in a process of dialog that involve discussion and conversation with self, research, colleagues, and participants (Pinnegar & Hamilton, 2009). Knowledge and understanding therefore emerge in the negotiation process between these actors.

Third, the work is grounded in a study of personal practice and experience within the space between self and other (Pinnegar & Hamilton, 2009). Because self-study research focuses on the relational nature of practice, experience, contexts, and lives of the researcher, it involves others and our relationships and interactions with them. This relationship is always placed on a continuum between self and others, however, with the study becoming more viable with a substantial account of the other (Hamilton & Pinnegar, 2015).

We favor a mutual relationship between the three aspects that mark self-study research and argue this to be the reason for the importance of 'turning to the self' in order for readers to draw out significant meanings from self-study research. The 'turn to the self' is where researchers 'make clear the meaning they are making and the understandings they develop as researchers and teacher educators based on the inquiry engaged in as supported by the data and their analysis' (Hamilton & Pinnegar, 2015, p. 212). It is where the researcher produces deeper and more nuanced answers to the so-what question by implicating the personal understanding and insight of the researcher that is useful for both the self and other practitioners (Hamilton & Pinnegar, 2015).

'Thinking with' Deleuze and Guattari's philosophy

Deleuze and Guattari (1987) offer multiple concepts which can each be used to unsettle and provoke alternative non-linear ways of thinking. Because we deliberately aim to reconceptualize the researcher-self in the self-study methodology, we engaged in a process of 'thinking with' (Jackson & Mazzei, 2012) the concept of 'assemblage'. That is, in order to produce different understandings of the knowledge construction in self-study, we were thinking with Deleuze and Guattari assemblage to turn the practice into something different, and we used the practice to push the concept of assemblage to its limits. The concept of assemblage was preferred because it allowed us to create something out of the chaos of disrupting and decentering the researcher-self (Jackson & Mazzei, 2012). In addition, to help

readers follow and understand our thinking, we engaged with two interrelated schematic cues (Jackson & Mazzei, 2012), 'multiplicity' and 'becoming'.

An assemblage is an aggregate of both human and non-human elements that combine and interact in a contextually unique manner to produce something (e.g., knowledge of teaching practice, a PhD thesis) (Strom & Martin, 2017). To contextualize to this study, a supervisory meeting is an assemblage, a constellation of elements – the doctoral candidate, the supervisors, the physical space, the data set, the articles, the ideas, and the discourses – that come into composition in different ways at different times to co-produce different ideas and knowledge. As such, just as much as human actors, the material world and even the non-tangible are acknowledged as a capacity to influence and shape knowledge construction. Instead of viewing the self of the doctoral candidate or our different selves as the sole actors constructing knowledge, the concept of assemblage highlights how a constellation of active human *and* non-human elements work together in a joint production of knowledge.

For Deleuze and Guattari (1987) everything is a multiplicity – that is, a collective of elements. A multiplicity should be considered in its substantive form, as a multiplicity of something (Parr, 2005). To contextualize to this study, doctoral candidate and supervisors are multiplicities composed of their own beliefs, backgrounds, experiences, languages, cultures, and investments. A supervisory multiplicity is a collection of the different doctoral candidate and supervisory multiplicities together with the multiplicities of non-human elements – such as chairs (composed of legs, backrest, expectations to sit on), journal articles (composed of words, ideas), the room environment (composed of expectations, power relations).

Furthermore, the university, national, and international systems are multiplicities composed of, knowledge, practices, and policies. As such, the research-self is a multiplicity (own beliefs, backgrounds, education) within multiplicities (supervisory, larger university, national, and international systems) (Strom & Martin, 2017). From a rhizomatic lens, the different multiplicities work simultaneously to influence the construction of knowledge. That is, it is the way the doctoral candidate's multiplicity combines and interacts with the other multiplicities – together creating the assemblage in total – that determines the type of knowledge that is being constructed. 'Becoming' expresses a happening rather than a thing (Strom & Martin, 2017) and concerns qualitatively different emergences that occur to, and within, a multiplicity, produced by the collective workings of the assemblage (Semetsky, 2006). That is, becoming is 'created through alliances, as bodies, ideas, forces, and other

elements come into composition in assemblages, and produce something new, different' (Strom & Martin, 2017, p. 8). To contextualize to this study, a doctoral candidate's evolving experiences as teacher educator together with the introduction of a different philosophy have the potential to create discussion that allows the research assemblage to produce different knowledge.

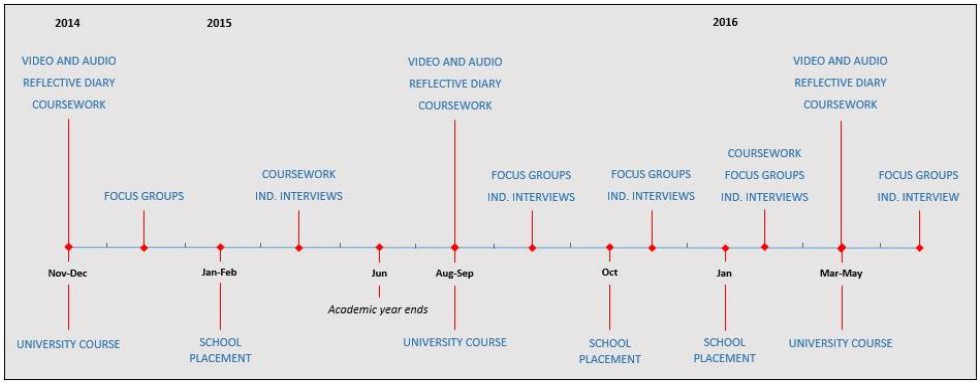
'Thinking with' (Jackson & Mazzei, 2012) the concept of assemblage (Deleuze & Guattari, 1987), we aim to look at the function and production of the research assemblage. Assemblage allowed us to consider the multiple elements comprising the research assemblage, and the ways they collectively functioned to produce knowledge, while decentering the researcher-self. Importantly, Deleuze and Guattari encourage the knowledge construction in self-study as a continuous nonlinear process of different emergence co-produced by a collective working assemblage.

Assembling and unfolding a self-study

In this chapter, because we focus on our research assemblage and not on Mats' particular self-study, we center this section on his PhD study. Mats was 26- year's old when he enrolled as a full-time doctoral candidate on a four year fully funded doctoral program at the Norwegian School of Sport Sciences (NSSS), a University located in Oslo, Norway. He resided within the Coaching and Psychology Department, one of five sport sciences fields at the NSSS. Mats decided that he wanted to do an article based thesis, requiring him to complete four publications. The PhD structure required Mats to both conduct research (75%) and teach (25%). One component of the program was successful completion of 40 credits of coursework. This entailed a home examination in 'subjects and methods' (30 credits), a course in 'science theory and ethics' (5 credits), and an elective 'methodology' course (5 credits).

Mats' self-study research involved four courses/modules: two practical based university content courses/modules and two phases of school placemen (Figure 1). He aimed to study the process of developing a pedagogy of teacher education, with a particular focus on teaching pre-service teachers about teaching a student-centered model (for detailed description of the self-study context, see Hordvik, MacPhail, & Ronglan, 2017). Figure 1 shows the data collection procedures that were completed to explore Mats' self-study and formed the empirical material influencing the research assemblage knowledge construction.

Mats' supervisory team included Lars Tore and Ann, two formally appointed supervisors, and Deborah, who functioned as a critical friend. Lars Tore was responsible for the PhD advertisement and served as Mats' supervisor. His area of expertise is coaching, coach education, and sociology. He was located at the NSSS where he functioned as Deputy Rector. Ann served as the co-supervisor and was located at the University of Limerick in Ireland where she functioned as Chair of the Department for Physical Education and Sport Sciences. Her area of expertise is physical education and teacher education, self-study, curriculum development, and assessment. Deborah resided within the same department as Ann and completed the supervisory team as Mats' 'critical friend'. Deborah is internationally renowned for upskilling pre-service teachers, teachers, and teacher educators in the area of sport pedagogy and has contributed extensively to research in the field.



'Plugging in' assemblage and the data

'Plugging in' is a process of producing something new by making and unmaking, arranging, organizing, and fitting together (Jackson & Mazzei, 2012). Given that we focus on the research assemblage, and not on Mats' particular self-study, we 'plugged in' assemblage into the data from our supervisory meetings. These meetings were carried out throughout the four year doctoral period and included individual meetings between Mats and Lars Tore or Ann, between the three of them, between Mats and Deborah, and between Mats, Ann, and Deborah. While not every single meeting was recorded, the data included 62 meetings with approximately 85 hours of audio. In addition, when connecting with other scholars, Mats

wrote notes and reflections during and after meetings.

'Thinking with' the thinking of Jackson & Mazzei (2012) we aimed to enter the research assemblage. We engaged in a process of reading the transcripts over and over while thinking with assemblage, aiming to show how the data and assemblage *'make one another' (p. 5)*. What *'emerged in the middle'* (p. 5) of plugging assemblage into the data and data into the assemblage, was the analytic question: 'How does a post-qualitative research assemblage work to decenter the 'self' in self-study of professional practices?' In the process of reading the data and plugging the analytic question into the data and the data into the question, we noticed how the research assemblage continuously evolved while particular situations provoked us to reorganize, adapt, and enhance our systems of thinking (Ovens, Garbett, & Hutchinson, 2016). Figure 2 was created in this process. While we acknowledge the linearity of Figure 2, it helped us engage with (and we think it can help readers engage with) particular connections and relationships throughout the four year PhD. We worked repeatedly with the particular situations that provoked us to ' "deform [them], to make [them] groan and protest"[9] with an overabundance of meaning' (Jackson & Mazzei, 2012, p. 5). This facilitated the process of creating something new while showing the '*suppleness of each [situation] when plugged in*' (Jackson & Mazzei, 2012, p. 5).

In the following sections, we engage with two situations that provoked us to reorganize, adapt, and enhance our systems of thinking. We aim to engage with the research assemblage function and production as a way of showing how a working assemblage constructs knowledge while decentering the researcher-self.

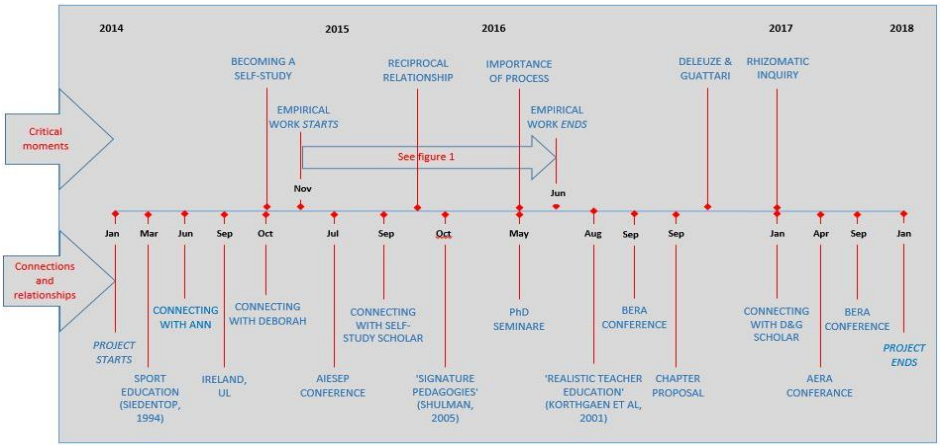


Figure 2. Mats PhD timeline – central moments, connections and relationships

Process of decentering the 'self'

Looking at the data through the lens of Deleuze and Guattari's assemblage, while bringing together past, present, and future (Pinnegar & Hamilton, 2015), we seek to know how assemblage is working to disrupt and decenter the researcher-self. According to Deleuze and Guattari (1987), assemblages consist of two axis. The horizontal axis comprises two parts: its content, or human and nonhuman elements (Mats, Ann, Lars Tore, and Deborah, desks, computer, journal articles, physical space, and the ways these connect) and its expressions (language and other discursive elements produced by, and producing, the assemblage). On a vertical axis, the assemblage has both reterritorializing aspects that stabilize it and 'cutting edges of deterritorialization, which carry it away' (Deleuze & Guattari, 1987, p.103).

In this section, we discuss the different components of the research assemblage, its content and expression, and how they worked together to co-construct particular kinds of knowledge and processes of decentering the researcher-self (the deterritorializing and reterritorializing functioning of the assemblage). We argue that the content and expression of the research assemblage created a space for deterritorialized edges. That is, they created conditions where the research assemblage could enter into relationships with, and interact with multiple human and nonhuman elements. As elements shifted, or particular conditions changed, the function and production of the assemblage also became different. Hence, the ways the unique set of elements, both human and non-human, comprising the research assemblage combined and interacted determined the type of knowledge constructed.

Becoming a self-study

Looking at the data through the lens of Deleuze and Guattari's (1987) assemblage, we sought to know how assemblage worked in the data. What emerged in the research assemblage was the way it grew unpredictably in all directions, connecting and expanding with both human and nonhuman elements – always becoming different. Figure 2. gives some justice to the nonlinearity of the assemblage function with different production seen as it connected and interacted with multiple human and nonhuman elements. In this section, acknowledging the scope of this chapter, we focus on the research assemblage in the space when it was becoming a self-study. While literature from journal articles and books influenced the assemblage's thinking in this period, we focus on how the research assemblage changed its function and

production as it entered into a relationship with Ann and Deborah.

As we read the data, what emerged was how the research assemblage created spaces that allowed Mats to connect and interact with both human and nonhuman elements. Mats' PhD position was connected to a project outline that Lars Tore had developed, an action research project looking at pre-service teachers' and team players' learning processes. However, instead of directing Mats towards the project outline, Lars Tore created a space for Mats to engage with the flexibility allowed at the institutional level and to follow his preferred area of interest. In the required research plan that was submitted after two months, the focus had shifted more towards physical education teacher education and pre-service teachers learning processes.

When Mats noticed that Ann was providing the keynote lecture at a conference at the NSSS, he suggested that he could try to connect with her. Through a colleague at the NSSS who was already collaborating with Ann, Mats was able to arrange a meeting with her at the conference. Mats sent a copy of the research plan to Ann for her comments prior to their meeting each other which resulted in Mats asking Ann if she wanted to contribute as a co-supervisor. It was in this space the research assemblage entered into a relationship with Ann. She entered the assemblage after six months, expressing that 'you don't want a co-supervisor that is going to agree to everything. You want two supervisors that will actually push you'.

Ann functioned as a catalyst for the research assemblage. Her knowledge and experience of physical education teacher education interacted with the research plan and started conversations in another way, introducing different ideas, concepts and people to the assemblage. Combined with the flexibility of the PhD, and Lars Tore and Mats' openness to change the focus of the thesis, the assemblage was able to produce different thinking.

In the autumn of 2014, Mats traveled to Ireland and stayed for seven weeks with Ann at the University of Limerick. Because of the project focus on student-centered models, Ann introduced Deborah to the assemblage. While the plan was to start the empirical work in August the next year, Deborah challenged Mats to start looking at his teaching of the model right away. It was in this space, where the focus was turning more towards Mats, that Ann introduced self-study to the research assemblage. This decision allowed Mats to enter into a critical friendship with Deborah.

Plugging the horizontal and vertical axis of assemblage into the data, we see how the relationship with Ann and Deborah worked to increase the heterogeneity of the assemblage

content and expression, and consequently what the assemblage was producing. The way Ann and Deborah's multiplicities (their different experiences, knowledge), and the ideas they introduced to the research assemblage, combined and interacted with Mats, Lars Tore, and the research plan, producing different thinking and knowledge that both carried the assemblage away and stabilized it. The following dialogue between Mats, Ann, and Deborah took place in Ann' chair of department office at the University of Limerick half way through Mats' seven week visit. It shows how the new content of the research assemblage challenged its expression and thinking, while working to stabilize it in the territory of self-study of professional practices. We are sitting around Ann' office table discussing a document with a figure similar to Figure 1.

> Ann: I think this is great [looking at a figure similar to Figure 1] but you have this as a guide and you will actually, after step one, you will review step two ... you can only take it in steps... [You also need to consider] what you want to contribute from this? We learn about your experiences and the challenges you face, well so what? Who do you want to inform?
>
> Mats: Make a guide for how to teach Sport Education [the student-centered model that they had decided to be the focus of Mats' teaching].
>
> Deborah: So you'd be speaking to research for teachers and teacher educators?
>
> Mats: Teacher educators would do it a bit different to teachers.
>
> Ann: So teach Sport Education from a teacher educator perspective ... If you'd set a guide to teach Sport Education without the qualification of this [teacher educators voice] I would have said that was nothing new, ... It's everywhere. But a guide to teach Sport Education from a teacher educator perspective ...
>
> Deborah: I don't think we really have anything that helps a teacher educator teach Sport Education to pre-service teachers.
>
> Ann: It actually talks more about the experience of pre-service teachers of learning about teaching Sport Education ... That's why the self-study is really important ... What you can do in this study is share with people your story, as a teacher educator ... with implications for those of us in teacher education working with pre-service

teachers. The next stage, another study altogether, is how to teach teacher educators to teach Sport Education.

Looking at the data through the lens of Deleuze and Guattari assemblage, we seek to know how new assemblage elements is producing different thinking in the dialogue above. What is key here is not what is said, but how the new human elements work to influence the content and expression of that dialogue. The multiplicities of Ann and Deborah (i.e., their experience and knowledge of physical education and teacher education) connected with Mats and the research plan that allowed the idea of self-study and a teacher educator perspective to be introduced to the assemblage. This challenged the habitual content and expression of the assemblage (Mats, Lars Tore, action research, focus on pre-service teachers learning processes) and carried the assemblage away into becoming a self-study of professional practices. Because of Ann and Deborah's continuous engagement in the research assemblage (i.e., formalized roles as supervisor and critical friend), the assemblage was stabilized in this other means of production, one that focused on a teacher educator's self in enactment and production of practice.

Furthermore, the way these new human actors, concepts and ideas combined and interacted with the other elements of the assemblage, worked to create differentiation in the assemblage roles. What emerged in our plugging of assemblage into the data was the way this different means of production re-configured the function of the supervisory role. While having interacted with Lars Tore on every aspect of the PhD, Mats was now interacting with Lars Tore, Ann, and Deborah at different times and generally about different content. The increased assemblage heterogeneity produced a space where Mats interacted most frequently with Lars Tore about the data analysis, with Ann about study constructs and structure, and with Deborah about his practice. In this way, Mats engaged with each of them at particular times and with a particular purpose to produce particular knowledge. Importantly, however, the assemblage in total constructed the knowledge produced by the PhD thesis. That is, the way the knowledge and ideas from these meetings interacted with each other and combined with other elements (e.g. journal articles, data, reviews on articles) determined the type of knowledge constructed.

Importance of process

By focusing on the research assemblage, we aim to show how assemblage was working within our meetings as our bodies, ideas, expressions, and research materials came together for a period of time to create new thinking. One such example of a working assemblage – that is, the way human and non-human elements combine and interact – is in a meeting between Mats, Ann, and Lars Tore, the day after Mats and Ann attended a PhD seminar in Norway, Oslo. We arranged the meeting because Ann's visit to Norway provided an opportunity to discuss the progression of the entire PhD and particularly the second study. We were placed around the table inside Lars Tore's Deputy Rector office at the NSSS. The table contained a document including the main constructs, aims, and empirical work of each of the four PhD studies, and an article draft of the second study. The particular study used a case study design (suggested as a method within self-study - Pinnegar and Hamilton, 2009) to investigate three pre-service teachers experiences of teaching in school placement, and was the study Mats presented at the PhD seminar. We began the meeting discussing the responses on Mats' presentation the day before,

> Ann: So it seemed to be that peoples' interest was more in the actual documentation of the [pre-service teachers'] learning process from start to where they are now, then taking a snippet for each of the three [pre-service teachers' experiences of teaching in school placement]. Remind me of the idea of your publications, what you would do [from article 1-4].
>
> Mats: [Explain the plan for each of the articles] ... So maybe this [article] can look at the [longitudinal] learning process, and the fourth article can concentrate more on [the entire pre-service teacher class] experience of teaching Sport Education in school placement ...
>
> Ann: And how does what you have to say in this paper differ from what you have planned to say in the fourth paper?
>
> Mats: No, I think that's a good point ...
>
> Lars Tore: I think those two papers have to be distinguished, so it has to be different questions. This article could be more longitudinal [covering all six phases in figure 1] ...

Mats: But if we look at the learning process, is it too much with three pre-service teachers? ...

Ann: We need to find a way of addressing the comments made yesterday about taking the reader from start to where they are now ... Would you take one of the three [pre-service teachers] out?

Mats: Maybe Calvin [anonymized] ... eh, it's difficult to take one out.

Lars Tore: But it's the question of why more than one? Why more than two? Why these three? ...

Ann: We have to compromise ... I think you need to come down to one [pre-service teacher] to show the process ...

Mats: I would have picked Michael [anonymized] because I think he is the most reflective one, reflected upon negative and challenging experiences ... If we pick Michael, should I approach him and ask for another interview?

Ann: What would be the reason for another interview?

Mats: To get the last part of the learning process (the last university course).

What is key here is not what is said, but how the assemblage works to ensure dialogue takes place and works to influence the content of that dialogue. What can be seen is that our dialogue was not straightforward where the idea that was introduced became the answer, it was a nonlinear dialogic process produced by and producing the research assemblage. That is, each of our multiplicities – as we were bringing together our past experiences, with our present understanding, and considering future enactments (Pinnegar & Hamilton, 2015) – combined and interacted with nonhuman elements (e.g., article draft, constructs, data set, and design) to co-produce new ideas. These ideas provoked the assemblage to think differently. In particular, the connections that Ann and Mats had made the day before made Ann introduce the notion of the learning process to the research assemblage. This idea interacted with the article draft and the document with constructs, aims, and empirical work for the four PhD articles. Combined with Mats and Lars Tore's experiences with, and knowledge of the data, the assemblage produced questions and new thinking about the study aim and design. Consequently, this discussion challenged the assemblage to re-organize its system of thinking

within which the article changed from one that takes a snapshot of three pre-service teachers' experiences of teaching in school placement, to focus on one pre-service teacher's longitudinal learning experience.

Conceptualizing 'self' as a process of coming into composition

Thinking with Deleuze & Guattari's (1987) concept of assemblage, the objective of this study was to focus attention on the way the self-study researcher is part of a research assemblage that works to produce the knowledge that emerges. We have highlighted the nonlinear and fundamentally relational process of constructing knowledge in self-study of professional practices and argue that Mats' researcher-self was disrupted and decentered through multiple processes of 'coming into composition'. That is, knowledge was co-constructed by the constellation of human *and* non-human elements comprising the research assemblage as well as 'the processes resulting from the different ways those processes combine and interact' (Strom, 2015, p. 322). In this way, each element, both human and nonhuman, functioned as active agents in joint production of the knowledge that was constructed. Instead of viewing self in self-study as an ego-centric self, in a Deluzian and Guattari lens self is understood as being co-produced through the constellation of elements functioning collectively to produce different becomings. Viewing self, practice, and knowledge production in self-study as coming into composition provides an alternative that decenters the conceptualization of self, and self and the other, in the methodology. We argue that the self of Mats became only one of multiple human *and* nonhuman elements in a joint construction of knowledge. This understanding highlights, together with the human actors, the nonhuman and material *others* in the process of dialogue as a way of coming to know in self-study.

We suggest that self-study researchers can decenter the researcher-self by embracing a research stance of 'coming into composition' where the researcher engages with a research assemblage to construct joint understanding of teaching and learning. This stance to self-study requires researchers to frame the research practice as an assemblage. That is, to avoid the possibility that the study becomes a study of the self, by the self, and for the self, researchers need to work to expand the research assemblage. Enter into relationships, connect to the current knowledge of the research community, and interact with the relationships and connections throughout the study. Embrace difference, both in data collection, and in the

coming to know process. It is this space that allows self-study researchers to grapple with the tensions between relevance and rigor, and effectiveness and understanding, that is inherent in the self-study of professional practices (Vanassche & Kelchtermans, 2015). While the tensions can never be reconciled, the function and production of a research assemblage can help self-study researchers acknowledge the need to constantly position themselves between the two tensions.

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Appendices

Appendix A: Project acceptance - The Norwegian Social Science Data Service

Appendix B: Consent forms

Appendix C: Focus group and interview protocols

Appendix D: Examples of rhizomatic maps

Appendix E: Situational analysis

Appendix A:

Project acceptance - The Norwegian Social Science Data Service

Norsk samfunnsvitenskapelig datatjeneste AS
NORWEGIAN SOCIAL SCIENCE DATA SERVICES

Harald Hårfagres gate 29
N-5007 Bergen
Norway
Tel: +47-55 58 21 17
Fax: +47-55 58 96 50
nsd@nsd.uib.no
www.nsd.uib.no
Org.nr. 985 321 884

Mats Melvold Hordvik
Seksjon for coaching og psykologi Norges idrettshøgskole
Postboks 4014 Ullevål Stadion
0806 OSLO

Vår dato: 31.10.2014 Vår ref: 40468 / 3 / MSS Deres dato: Deres ref:

TILBAKEMELDING PÅ MELDING OM BEHANDLING AV PERSONOPPLYSNINGER

Vi viser til melding om behandling av personopplysninger, mottatt 27.10.2014. Meldingen gjelder prosjektet:

40468	*A Self-study of teaching Sport Education in Physical Education Teacher Education*
Behandlingsansvarlig	*Norges idrettshøgskole, ved institusjonens øverste leder*
Daglig ansvarlig	*Mats Melvold Hordvik*

Personvernombudet har vurdert prosjektet og finner at behandlingen av personopplysninger er meldepliktig i henhold til personopplysningsloven § 31. Behandlingen tilfredsstiller kravene i personopplysningsloven.

Personvernombudets vurdering forutsetter at prosjektet gjennomføres i tråd med opplysningene gitt i meldeskjemaet, korrespondanse med ombudet, ombudets kommentarer samt personopplysningsloven og helseregisterloven med forskrifter. Behandlingen av personopplysninger kan settes i gang.

Det gjøres oppmerksom på at det skal gis ny melding dersom behandlingen endres i forhold til de opplysninger som ligger til grunn for personvernombudets vurdering. Endringsmeldinger gis via et eget skjema, http://www.nsd.uib.no/personvern/meldeplikt/skjema.html. Det skal også gis melding etter tre år dersom prosjektet fortsatt pågår. Meldinger skal skje skriftlig til ombudet.

Personvernombudet har lagt ut opplysninger om prosjektet i en offentlig database, http://pvo.nsd.no/prosjekt.

Personvernombudet vil ved prosjektets avslutning, 20.02.2018, rette en henvendelse angående status for behandlingen av personopplysninger.

Vennlig hilsen

Katrine Utaaker Segadal

Marie Strand Schildmann

Kontaktperson: Marie Strand Schildmann tlf: 55 58 31 52
Vedlegg: Prosjektvurdering

Personvernombudet for forskning

Prosjektvurdering - Kommentar

Prosjektnr: 40468

Utvalget informeres skriftlig og muntlig om prosjektet og samtykker til deltakelse. Informasjonsskrivet er godt utformet, men det bør på grunn av din dobbeltrolle (underviser/forsker) overfor de som forespørres i enda større grad presiseres at det er frivillig å delta og at det ikke vil få noen konsekvenser dersom de ikke ønsker å delta i prosjektet. Det bør også fremgå at det er frivillig å tilgjengeliggjøre elevarbeidene (mappeinnleveringene til studentene), og at du ber om samtykke til dette. Med andre ord må det innhentes samtykke fra samtlige, og det kan derfor være en fordel om du utformer en samtykkeerklæring hvor de krysser av for hvilke deler de ønsker å delta i dersom de vil være med i forskningsprosjektet.

I tillegg bør det settes en dato for anonymisering eller presiseres dersom man ønsker samtykke til lagring på ubestemt tid. Det bør også fremgå at det er prosjektleder som vil gjennomføre oppfølging av studien og at opplysnignene ikke utleveres til andre.

Revidert informasjonsskriv skal sendes til personvernombudet@nsd.uib.no før utvalget kontaktes.

Det forutsettes at det ikke gjøres videoopptak av tredjepersoner (elever), f. eks. i forbindelse med studentenes skolepraksis.

Personvernombudet legger til grunn at forsker etterfølger Norges idrettshøgskole sine interne rutiner for datasikkerhet. Dersom personopplysninger skal lagres på mobile enheter, bør opplysningene krypteres tilstrekkelig.

Forventet prosjektslutt er 20.02.2018. Ifølge prosjektmeldingen skal innsamlede opplysninger da lagres videre. Ombudet vil ta kontakt med prosjektleder for en avklaring av status/videre lagring ved NIH.

Appendix B

Consent forms

Forespørsel om deltakelse i forskningsprosjektet

"A Self-study of Models Based Practice in Teacher Education"

Bakgrunn og formål
Det er utført relativt lite forskning på hvilke utfordringer høgskolelærere møter når de skal undervise kommende kroppsøvingslærere i hvordan undervise gjennom læreplanmodeller. Det overordnede formål med studien (doktorgradprosjekt) er derfor å undersøke reisen og stegene en høgskolelærer på Norges Idrettshøgskole tar når han underviser studenter på studiet Faglærer i Kroppsøving og Idrettsfag (FKI) i hvordan undervise gjennom læreplanmodellen 'Sport Education'.

Dette er en studie av undertegnedes undervisning av FKI studenter. Studenter som deltar i undervisning blir derfor naturlige deltaker.

Hva innebærer deltakelse i studien?
Studien vil inneholde FKI 227 (håndball). Studentene vil ikke bli pålagt mer tid og arbeid enn hva som allerede kreves i de tre modulene. Datainnsamlingen vil bli gjort gjennom fokus gruppeintervjuer, video- og lydopptak og mappeinnleveringer. Det er frivillig å delta i studien og å tilgjengeliggjøre mappeinnleveringer (se avkrysning for samtykke nederst).
Intervjuene vil omhandle samtlige studenters forståelse av 'Sport Education'. Mappeinnleveringene vil bli brukt som tilleggsopplysninger. Video- og lydopptak vil bli anvendt for å verifisere høyskolelærerens egne refleksjoner vedrørende hans undervisning.

Hva skjer med informasjonen om deg?
Alle personopplysninger vil bli behandlet konfidensielt. Det er kun undertegnede som lærer/forsker som vil få tilgang til personopplysningene. Navnelister og andre personopplysninger vil lagres adskilt fra øvrige data.
Det vil være tilnærmet umulig å gjenkjenne noen av deltakerne i publikasjoner da synonymer vil bli brukt på samtlige deltakere.

Prosjektet skal etter planen avsluttes januar 2018. Prosjektleder ønsker å bruke datamaterialet i oppfølgingsstudier og det er derfor et ønske om å lagre data i etterkant av prosjektet (ubestemt tid). Materialet vil ikke bli utlevert til andre. Se avkrysning for samtykke nederst.

Frivillig deltakelse
Det er frivillig å delta i studien, og du kan når som helst trekke ditt samtykke uten å oppgi noen grunn. Det vil ikke få noen konsekvenser dersom du ikke ønsker å delta i studien eller velger å trekke deg underveis. Dersom du trekker deg, vil alle opplysninger om deg bli anonymisert.

Dersom du ønsker å delta eller har spørsmål til studien, ta kontakt med Mats Melvold Hordvik, tlf. 930 47 202 eller veileder Lars Tore Ronglan, tlf. 924 61 646.

Studien er meldt til Personvernombudet for forskning, Norsk samfunnsvitenskapelig datatjeneste AS.

Samtykke til deltakelse i studien

Jeg har mottatt informasjon om studien, og er villig til å delta

---

(Signert av prosjektdeltaker, dato)

FKI227

- ☐ Jeg samtykker til å delta i fokus gruppeintervju
- ☐ Jeg samtykker til at video- og lydopptak av økter blir brukt som datainnsamling
- ☐ Jeg samtykker til tilgjengeliggjøring av mappeinnleveringer
- ☐ Jeg samtykker til videre lagring og bruk av opplysningene.

Forespørsel om deltakelse i forskningsprosjektet

"A Self-study of Models Based Practice in Teacher Education"

Bakgrunn og formål
Det er utført relativt lite forskning knyttet til lærerutdannerens undervisningen av undervisningsmodellen «Sport Education». Det overordnede formål med studien (doktorgradprosjekt) er å undersøke reisen og stegene en lærerutdanner på Norges Idrettshøgskole tar i undervisningen av SE på bachelorstudiet Faglærer i Kroppsøving og Idrettsfag (FKI). I tilknytning til dette vil studentenes læringsprosesser og læringsutbytte bli undersøkt og informere lærerutdannerens praksis.

Hva innebærer deltakelse i studien?
Studien vil inneholde seks hoveddeler fordelt på fire FKI moduler som gjennomføres andre og tredje år bachelor. Del en, FKI227 håndball; del to, FKI250 skolepraksis; del tre FKI360 ballspill (høstsemester); del fire og fem FKI350 skolepraksis (høst- og vårsemester); og del seks, FKI360 ballspill (vårsemester). Studentene vil ikke bli pålagt mer tid og arbeid enn hva som allerede kreves i de tre modulene. Datainnsamlingen vil inneholde fokus gruppeintervju, dybdeintervju, video- og lydopptak, mappeinnlevering og praksisrapport. Det er frivillig å delta i studien og å tilgjengeliggjøre mappeinnlevering og praksisrapport (se avkrysning for samtykke nederst).
Fokus gruppeintervjuet vil omhandle studentenes forståelse av 'Sport Education'. Dybdeintervjuet vil omhandle studentens opplevelse av å anvende SE i skolepraksis. Mappeinnlevering og praksisrapport vil bli anvendt som tilleggsopplysninger. Video- og lydopptak vil bli anvendt for å verifisere og informere lærerutdannerens egne refleksjoner vedrørende undervisningen.

Hva skjer med informasjonen om deg?
Alle personopplysninger vil bli behandlet konfidensielt. Det er kun undertegnede som lærerutdanner/forsker som vil få tilgang til personopplysningene. Navnelister og andre personopplysninger vil lagres adskilt fra øvrige data.
Det vil være tilnærmet umulig å gjenkjenne deltakerne i publikasjoner da synonymer vil bli brukt på samtlige.

Prosjektet skal etter planen avsluttes januar 2018. Prosjektleder ønsker å bruke datamaterialet i oppfølgingsstudier og det er derfor et ønske om å lagre data i etterkant av prosjektet (ubestemt tid). Materialet vil ikke bli utlevert til andre. Se avkrysning for samtykke nederst.

Frivillig deltakelse
Det er frivillig å delta i studien, og du kan når som helst trekke ditt samtykke uten å oppgi noen grunn. Det vil ikke få noen konsekvenser dersom du ikke ønsker å delta i studien eller velger å trekke deg underveis. Dersom du trekker deg, vil alle opplysninger om deg bli anonymisert.

Dersom du ønsker å delta eller har spørsmål til studien, ta kontakt med Mats Melvold Hordvik, tlf. 930 47 202 eller veileder Lars Tore Ronglan, tlf. 924 61 646.

Studien er meldt til Personvernombudet for forskning, Norsk samfunnsvitenskapelig datatjeneste AS.

Samtykke til deltakelse i studiens del 2

Jeg har mottatt informasjon om studien, og er villig til å delta

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(Signert av prosjektdeltaker, dato)

FKI250

☐ Jeg samtykker til å delta i dybdeintervju.
☐ Jeg samtykker til tilgjengeliggjøring av praksisrapport.
☐ Jeg samtykker til videre lagring og bruk av opplysningene.

Forespørsel om deltakelse i forskningsprosjektet

"A Self-study of Models Based Practice in Teacher Education"

Bakgrunn og formål
Det er utført relativt lite forskning knyttet til lærerutdannerens undervisningen av undervisningsmodellen «Sport Education» (SE). Det overordnede formål med studien (doktorgradprosjekt) er å undersøke lærerutdannerens undervisningen av SE på bachelorstudiet Faglærer i Kroppsøving og Idrettsfag (FKI) på Norges Idrettshøgskole. FKI studentenes læringsprosesser og læringsutbytte blir dermed av naturlig interesse og vil bli undersøkt for å kunne informere lærerutdannerens praksis.

Hva innebærer deltakelse i studien?
Studien vil inneholde seks hoveddeler fordelt på fire FKI moduler som gjennomføres andre og tredje år bachelor. Del en, FKI227 håndball; del to, FKI250 skolepraksis; del tre FKI360 ballspill (høstsemester); del fire og fem FKI350 skolepraksis (høst- og vårsemester); og del seks, FKI360 ballspill (vårsemester). Studentene vil ikke bli pålagt mer tid og arbeid enn hva som allerede kreves i de tre modulene. Datainnsamlingen vil inneholde fokus gruppeintervju, dybdeintervju, video- og lydopptak, mappeinnlevering. Det er frivillig å delta i studien og tilgjengeliggjøring av mappeinnleveringer (se avkrysning for samtykke nederst).
Fokus gruppeintervjuene vil omhandle studentenes opplevelse av undervisningen og forståelse av 'Sport Education', i tillegg til erfaringer fra skolepraksis. Dybdeintervjuene vil omhandle studentens opplevelse av å anvende SE i skolepraksis. Mappeinnlevering vil bli anvendt som tilleggsopplysninger. Video- og lydopptak vil bli anvendt for å verifisere og informere lærerutdannerens egne refleksjoner vedrørende undervisningen.

Hva skjer med informasjonen om deg?
Alle personopplysninger vil bli behandlet konfidensielt. Det er kun undertegnede som lærerutdanner/forsker som vil få tilgang til personopplysningene. Navnelister og andre personopplysninger vil lagres adskilt fra øvrige data.
Det vil være tilnærmet umulig å gjenkjenne deltakerne i publikasjoner da synonymer vil bli anvendt på samtlige.

Prosjektet skal etter planen avsluttes januar 2018. Prosjektleder ønsker å bruke datamaterialet i oppfølgingsstudier og det er derfor et ønske om å lagre data i etterkant av prosjektet (ubestemt tid). Materialet vil ikke bli utlevert til andre. Se avkrysning for samtykke nederst.

Frivillig deltakelse
Det er frivillig å delta i studien, og du kan når som helst trekke ditt samtykke uten å oppgi noen grunn. Det vil ikke få noen konsekvenser dersom du ikke ønsker å delta i studien eller velger å trekke deg underveis. Dersom du trekker deg, vil alle opplysninger om deg bli anonymisert.

Dersom du ønsker å delta eller har spørsmål til studien, ta kontakt med Mats Melvold Hordvik, tlf. 930 47 202 eller veileder Lars Tore Ronglan, tlf. 924 61 646.

Studien er meldt til Personvernombudet for forskning, Norsk samfunnsvitenskapelig datatjeneste AS.

Samtykke til deltakelse i studiens del 3

Jeg har mottatt informasjon om studien, og er villig til å delta

---

(Signert av prosjektdeltaker, dato)

FKI360

- ☐ Jeg samtykker til å delta i fokus gruppeintervju
- ☐ Jeg samtykker til at video- og lydopptak av økter blir brukt som datainnsamling
- ☐ Jeg samtykker til tilgjengeliggjøring av mappeinnleveringer og diskusjoner/refleksjoner på Fronter
- ☐ Jeg samtykker til å delta i dybdeintervju.
- ☐ Jeg samtykker til videre lagring og bruk av opplysningene.

Appendix C

Focus group and interview protocols

Focus group protocols

Focus group 1 (end of first university course and prior to first school placement)

- Sport Education features
- Lesson structure and learning experiences
- Role of the teacher educator
- View of teaching Sport Education during school placement.

Focus group 2 (end of first period of second university course and prior to second school placement)

- General about the learning experiences
- Lesson structure/pedagogical approach – Sport Education vs content
- Sport Education features – pros and cons
- Role of the teacher educator
- Expectations of teaching Sport Education in school placement
- If they were the teacher educator - What would you have done differently?

Focus group 3 (in between second school placement)

- Personal experience (context, facilities, adjustments/modifications, general experience)
- Experience vs expectations
- Studnet
- Sport Education – fidelity
- How prepared did you feel?
- Retrospectively – what would you have done differently in the first period?
- What is important for their learning in the second period?

Focus group 4 (end of second school placement)

- Adjustments/modifications – general, and between first and second period
- Students
- Importance of school placement for their learning
- Continued use of Sport Education as teachers
- What is important for their learning in the second period?

Focus group 5 (end of second period of university course)

- Experiences from the last period of the university course
- The second university course as a whole
- The physical education teacher education program as a whole and the specific course as one part of the program.
- Continued use of Sport Education as teachers

Individual interview - protocol 1

End of first school placement

Experience / teaching:

Explain your Sport Education (SE) teaching. Planning, teaching, features of SE you used.

What did you experience as difficult/easy in you SE teaching?

Have your understanding of the model changed after school placement? In what way?

Students, cooperating teacher, and fellow pre-service teacher:

How did students respond to your SE teaching? How did it affect you?

How did the cooperating teacher respond your SE teaching? How did it affect you?

How did the fellow pre-service teacher respond your SE teaching? How did it affect you?

Is there anything you missed? Something that could facilitate your teaching? Initiatives.

The Sport Education model

What do you like about the model?

What do you dislike or would change with the model?

To what extent did you feel confident using the model?

What can facilitate/inhibit your future use of SE as a teacher?

How would you describe SE to other pre-service teachers in your class?

University course

Retrospectively, what would you have changed with the university course?

Retrospectively, which parts of the university course do you consider effective/ineffective?

Individual interview - protocol 2

End of first period of second university course and prior to second school placement

Sport Education model

What do you like about the model?

What do you dislike or would change with the model?

How would you describe SE to other pre-service teachers in your class?

University course

What do you consider as the biggest difference between this years and last year's university course? Positive/negative.

Which parts of the university course do you consider effective/ineffective?

Teaching Sport Education

What experiences do you take with you from last year's SE teaching into school placement this year? What did you learn? What will you do differently?

What do you expect would become difficult/easy in you SE teaching?

How do you expect students to respond to your SE teaching?

To what extent do you feel confident using SE?

What can facilitate/inhibit your future use of SE as a teacher?

Is there anything we can do to facilitate your school placement teaching? Initiatives.

Individual interview - protocol 3 & 4

In between and end second school placement

Experience / teaching:

Explain your Sport Education (SE) teaching. Planning, teaching, features of SE you used.

What did you experience as difficult/easy in you SE teaching?

Students, cooperating teacher, and fellow pre-service teacher:

How did students respond to your SE teaching? How did it affect you?

How did the cooperating teacher respond your SE teaching? How did it affect you?

How did the fellow pre-service teacher respond your SE teaching? How did it affect you?

The Sport Education model:

What do you like about the model?

What do you dislike or would change with the model?

To what extent did you feel confident using the model?

What can facilitate/inhibit your future use of SE as a teacher?

How would you describe SE to other pre-service teachers in your class?

Have your understanding of the model changed after two university periods and two school placements? In what way?

University course:

Retrospectively, what would you have changed with the university course?

Is there anything you missed? Something that could facilitate your teaching? Initiatives.

Individual interview - protocol 5

End of second university course

Background:

Background (school, sports, etc.)

Why teacher education? Why teacher?

School placement:

Describe the two schools placements and the two classes. Characteristics of students, cooperating teacher, teaching and learning environment.

University course:

What would you have changed with the last university course? Effective/ineffective

The entire learning process:

- Explain the process
- Positive/negative/challenging
- Aha moments
- The most important aspect you have learned

Sport Education:

How would you describe SE to other pre-service teachers in your class? What is the minimum you need to use?

What do you experience is difficult/easy with SE? Teaching using SE?

What do you appreciate with SE? Teaching using SE?

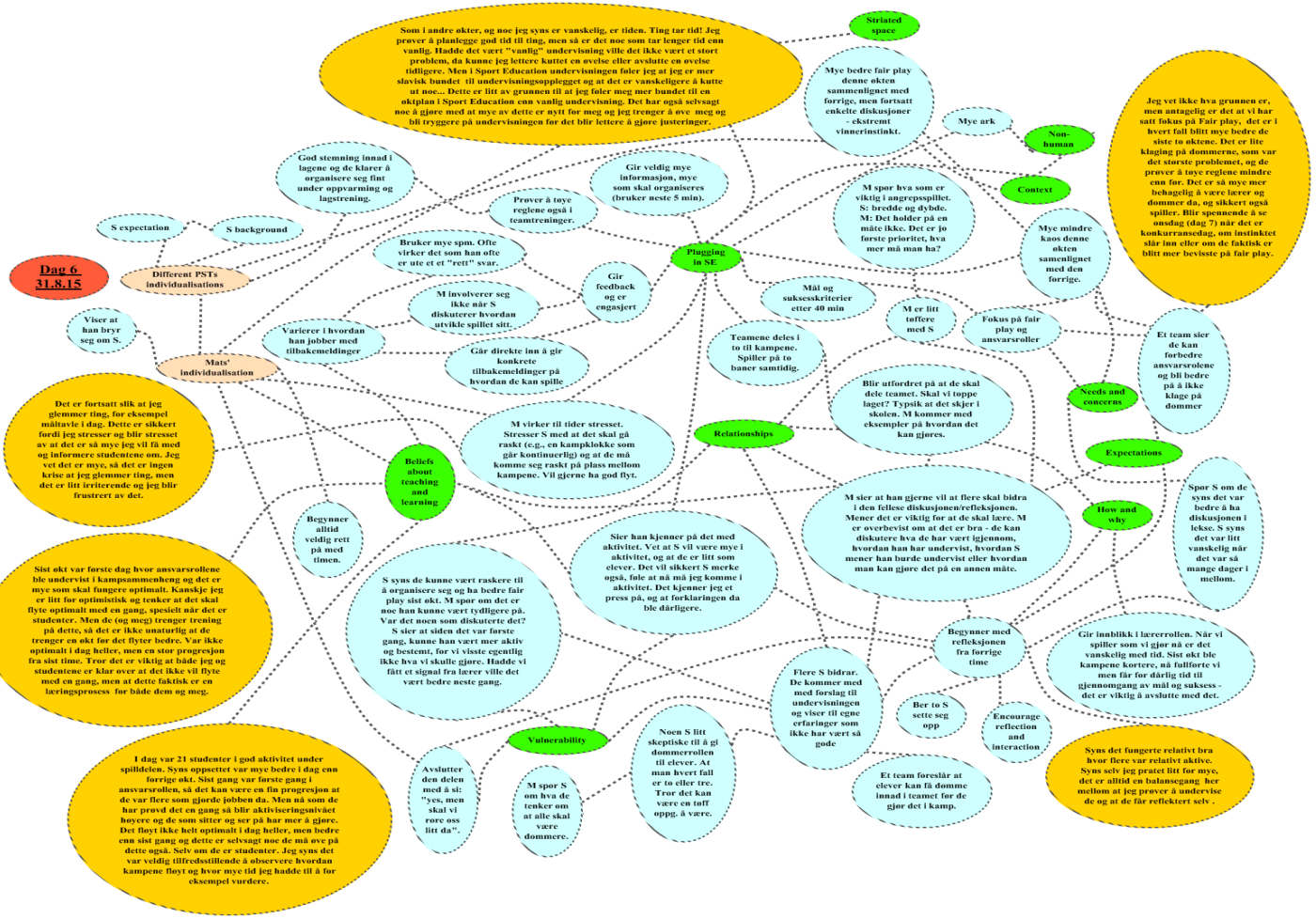
Future use of Sport Education:

Confident/insecure

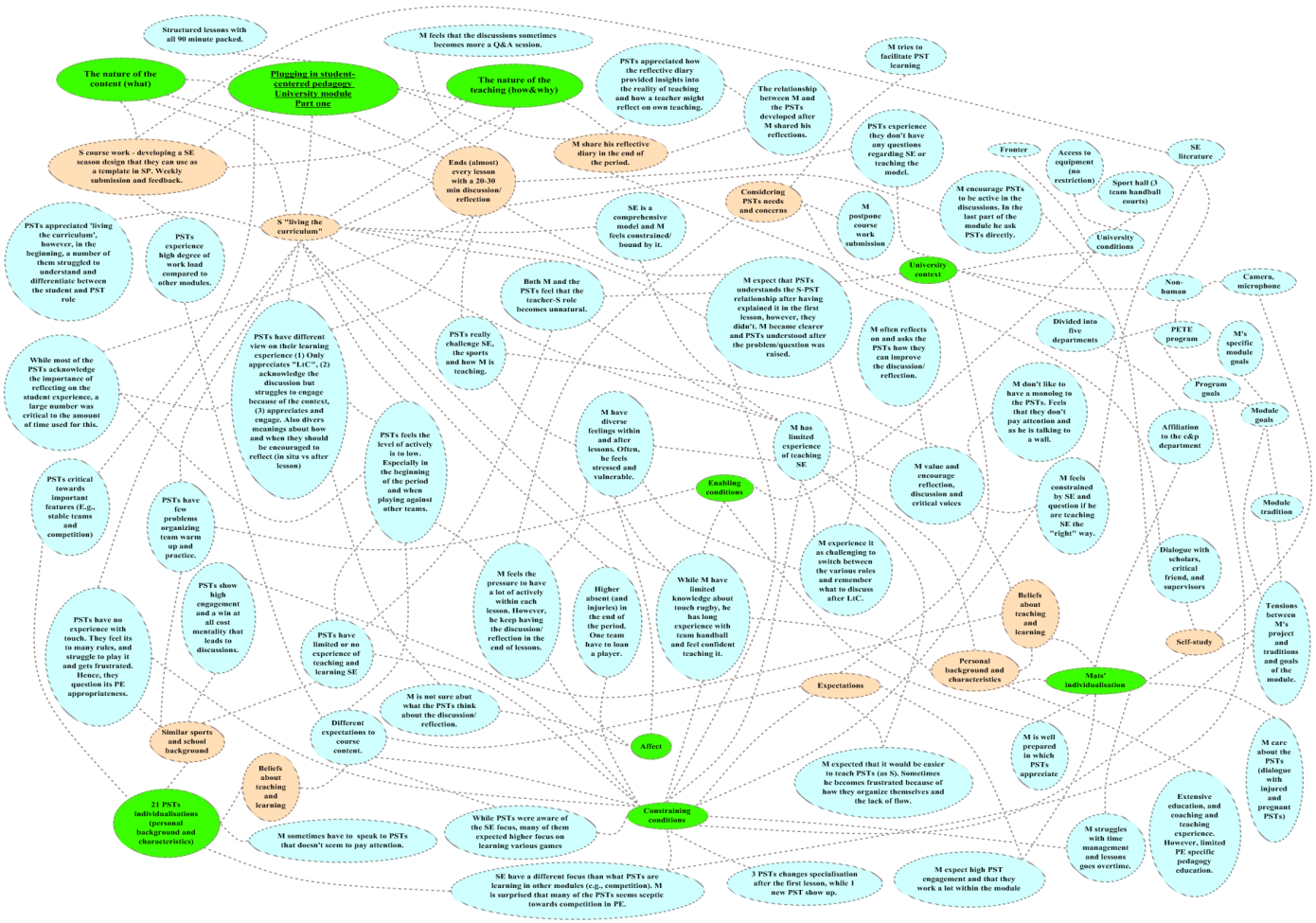
What can facilitate/inhibit your future use of SE as a teacher?

Appendix D

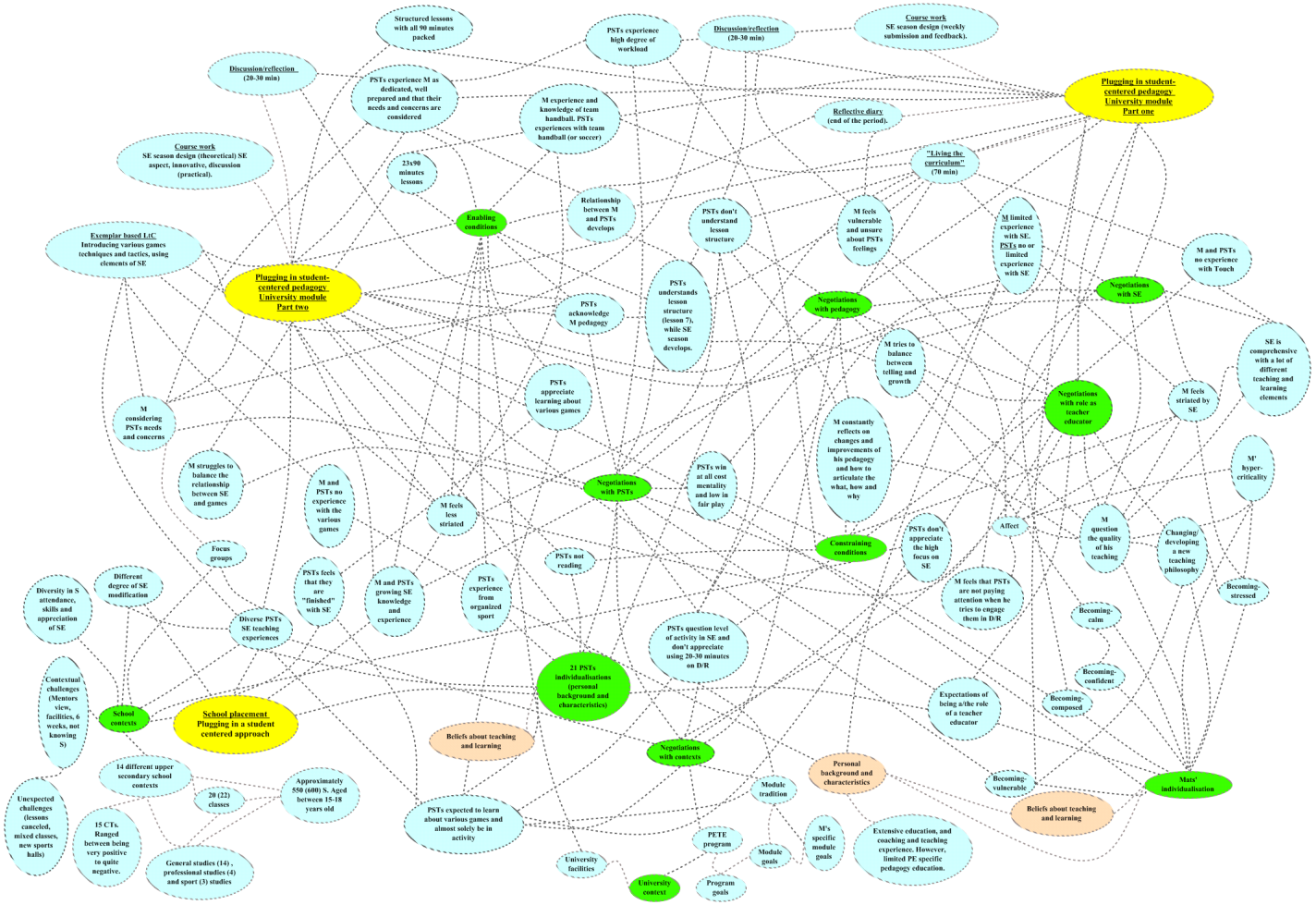
Examples of rhizomatic maps



Rhizomatic map – Second university course, lesson six



Rhizomatic map – Second university course, period one



Rhizomatic map – Synthesize map

Appendix E

Situational analysis

"Who and what are in the situation?" Who and what matters in this situation?

PETE module	First and second period	
People	Mats; PSTs; Critical friend; Other teacher educators	
Setting	• Norwegian School of Sport Sciences • Three sports halls	
Constraining factors	**Elements Mats brought** • His hypercriticality • Limited PETE teaching experience • Limited SE experience teaching • No experience with Touch, Kin-ball, Pickleball, Korfball, Ultimate	**Elements in the environment** • Nature of the PETE program • Module tradition • Sport Education • PST expectations • PST background and experience (no or limited SE and games, win at all cost mentality and low fair play • PSTs not reading • PSTs experience high degree of work load • PSTs don't understand lesson structure • PSTs critical towards
Enabling factors	**Elements Mats brought** • Teaching/coaching experience • Team handball subject knowledge	**Elements in the environment** • 23 x 90 minute lessons • Relatively small class (21) • PSTs familiar with team handball • PSTs experiences from organized sport • Critical friend • PSTs growing SE knowledge and experience
Pedagogy	• "Living the curriculum"/modelling • Reflecting and discussing the "hows" and "whys" • Sharing his teaching philosophy and reflective diary • Continuous coursework • School placement	
Dilemmas/ problems of practice	• Balance the relationship between SE and Touch/Team handball • Balance the relationship between activity and discussion/reflection • Teaching the what, how and why • Mats feels constrained/striated by SE • Mats feels overwhelmed /inadequate • Different PST needs and concerns • PSTs resistance to SE and Touch • PSTs struggle to understand the PST-student relationship • PST absence in the end of the period • Mats struggles to engage PSTs to reflect/discuss	
Processes/ changes	• Growing/developing relationships • Growing/developing knowledge and experience of teaching and learning SE • PSTs understands Mats' pedagogy • Content focus changes	

"Who and what are in the situation?" Who and what matters in this situation?

PETE module	Practicum/school placement	
People	PST; PST partner; Students; Mentor/Cooperative teacher	
Setting	• Classroom (Small gymnasium – one sports hall) • Equipment (Limited – adequate) • General (14) and vocational (7) studies • 550 students aged 15-18 yeras • 16-34 students in class	
Constraining factors	**Elements PSTs brought** • Limited teaching experience • No or limited experience teaching SE • Beliefs about teaching and learning • Negative to SE • Not modifying their SE teaching	**Elements in the environment** • Two three-week periods • Teach and actively observe their peer for eight hours, six hours shared supervision • Teaching SE between 4-6 lessons • Students not familiar with SE or other student-centered approaches • Student characteristics (not engaged, skilled, or familiar with team handball) • PSTs don't know students • Negative mentor • Nosy because of air system
Enabling factors	**Elements PSTs brought** • SE knowledge from PETE course • Positive to SE • Modify their SE teaching	**Elements in the environment** • Student characteristics (engaged, skilled, familiar with team handball) • Positive mentor •
Pedagogy	• Teams, roles, task cards • Varying degree of model modification/fidelity	
Dilemmas/ problems of practice	• Using different classrooms • Low attendance • Struggle to speak the Norwegian language • Different class/group without being told • Required by the mentor to teach Floorball • Different classes having PE together (grades, studies) • Students leaving classroom during lesson • Degree of SE modification • Consider students ability/skills • Students resistance to student-centered teaching • Students struggle to take their role responsibility • Not enough time to teach SE	

"Who and what are in the situation?" Who and what matters in this situation?

PETE module	Second period of (ball) games course	
People	Mats; PSTs; Critical friend, Other teacher educators	
Setting	• Norwegian School of Sport Sciences • Three sports halls • Equipment	
Constraining factors	**Elements Mats brought** • His hypercriticality • Limited knowledge about the different games	**Elements in the environment** • Nature of the PETE program • Module tradition • Sport Education • PSTs not reading • PST absent • Different focus than in other PETE modules • PSTs experience high degree of work load compared to other modules • Different group in other modules
Enabling factors	**Elements Mats brought** • Teaching/coaching experience • Team handball subject knowledge	**Elements in the environment** • 10 x 90 minute lessons • Relatively small class (21) • PSTs skilled • Critical friend
Pedagogy	• Experiencing the various games • Reflecting and discussing the "hows" and "whys" • Use questions • Course work	
Dilemmas/ problems of practice	• Balance the relationship between SE and the various activities • Integrate SE elements • PSTs challenge SE and Mats' teaching of SE-elements • PST absent • Surface teaching of the various games • Considering the different PSTs needs and concerns (from practicum)	

What are the social negotiations in the situation?

Assemblage element	Micro analysis of element	Connection to assemblage elements
Context	*PETE-program* o No tradition for curriculum and instructional models. o Program and module goals o Focus in other modules (e.g., negative outcomes of competition – minimise its application in PE) o The specific module (SE-PETE) has traditionally focused solely on developing content knowledge and understanding related to untraditional games.	**Mats** Considered module goals and tradition when developing year and block plans. **PSTs** Expected to learn about untraditional games almost solely through the game (practical). **Sport Education** SE was line with learning objectives of the program (e.g., pedagogical knowledge, broad knowledge of class and group management, learning environment and development of good relations to and between students) and learning objectives of the module (e.g., didactical competence, contribute to innovation and innovation processes). Competition and its positive effects highlighted in SE, and that differed from what other teacher educators was emphasizing. **Mats' pedagogy** Not in line with the tradition of the module, but in line the stated module working methods (i.e., Alternate between lectures and student-active forms of work such as group work and presentation of assignments - practical and theoretical) **Assemblage one (SE-PETE period one)** The nature of the PETE program (no C&I models), other teacher educators' focus on the negative aspects of competition, and module tradition contributed to conflicting/ less productive practice. **Assemblage two (PST practicum)** Not a tradition that PSTs are required to teach in a particular way in practicum. **Assemblage three (SE-PETE period two)** The module tradition contributed to a more harmonises practice.
Mats	*Personal background and characteristics* o Team handball and soccer as player, and other traditional games in PE o Multi-activity and teacher-centered approach o Coaching-centered and game-based approach o Hypercriticality and focus on fidelity *Education* o NSSS – coaching and psychology (bachelor and master) o NSSS – one year supplementary year in pedagogy o IV certification as a team handball coach *Professional background*	**Context** Limited knowledge and experience teaching in PETE. **PSTs** Questioned the fact that Mats never had thought through SE in school. **Sport Education** Personal background and characteristics contributed to his focus on SE fidelity. **Mats' pedagogy** Informed by his knowledge about teaching and learning SE; his new philosophy; team handball knowledge.

	○ PE teacher for 2,5 years ○ Team handball coach for 14 years *SE knowledge and experience* ○ Taught one SE course the year before (self-study) ○ No formal SE education ○ Knowledge through reading and supervision/guidance from critical friend *(New) Beliefs about teaching and learning* ○ Aim to articulate the what, how and why of teaching – provide insight into teaching ○ PSTs need to reflect and discuss their experiences, its more than living the curriculum ○ Collaboration and PST responsibility ○ Questioning	**Assemblage one (SE-PETE period one)** No former touch experience and limited SE experience contributed to a chaotic practice, with his fidelity focus made him implement too many SE elements. His team handball expertize together with growing experience with SE contributed to a more productive practice. Limited PETE experience and his changing philosophy contributed to his becoming-stressed. **Assemblage two (PST practicum)** His beliefs about learning to teach made him arrange for the opportunity that PSTs were required to teach SE in one class. **Assemblage three (SE-PETE period two)** While his specific game knowledge was relatively limited, the focus on games with SE in the background, together with his growing SE experience contributed to him becoming-calm and becoming-confident.
PSTs	*Personal background and characteristics* ○ Aged between 20 and 29 years old (sixteen graduated from high school one or two years prior to entering the PETE program) ○ Growing up in different parts of Norway ○ Win at all cost mentality and show low degree of fair play *Sports and PE background* ○ Participated in organized sport. All, except one, had background from one or two of the most widespread team sports in Norway (soccer and team handball). ○ Positive experiences from PE. Skilled and high grades. ○ Experienced "traditional" teacher-centered PE teaching *Experience with the content (SE, Touch, Team handball, Kin-ball, Pickleball, Korfball, Ultimate)* ○ No or limited (six participated in the SE course a year before) experience with SE or other curriculum and instructional models ○ Experiences with team handball, but no experience with the other games *Expectations to module* ○ Learn the content knowledge of untraditional games ○ Almost solely learn trough practical lessons	**Context** PSTs had not learned about SE or other C&I in other modules. Because of the module tradition, they expected to learn about various untraditional games solely through practical lessons. **Mats** Mats role as teacher educator represented a break from the norm **Sport Education** The different SE elements represented a teaching and learning environment that represented a break from the norm of what PSTs visualized PE practice. **Mats' pedagogy** Mats' pedagogy represented a break from the norm. PSTs experienced Mats' pedagogy as different from what they were used to. Expected to be provided with content knowledge of various games and drills they could copy and use as teachers. **Assemblage one (SE-PETE period one)** PSTs previous sport (no experience with touch), PE and PETE experience (no experience with C&I models), as well as their module expectations and win at all cost mentality and fair play characteristics, contributed to conflicting and less productive practice. Their team handball experience and growing SE understanding contributed to a more productive practice in the second half of the period. Their expectation and lack of understanding of the lesson structure contributed to a conflicting/ less productive practice. **Assemblage two (PST practicum)** PSTs limited experience of teaching and learning SE (and other student-centered approaches), and teaching in general, as well as their lack of knowledge about the practicum context, contributed to less productive experiences for some of the PSTs. **Assemblage three (SE-PETE period two)** Assemblage three was representative for PSTs expectations, this contributed to a harmonise practice. PSTs growing SE teaching and learning experience contributed to productive practice, while their feeling of being 'finished' with SE contributed to conflicting aims between them and Mats.
Sport Education	○ Curriculum and instructional model for teaching PE- Based on constructivist learning theory - Student-centered	**Context** SE or other C&I was not delivered in the PETE program. SE represented something different, especially with respect to the teaching of games, from what was the focus in other modules.

	○ Comprehensive and include a workbook – recipe ("Complete guide to SE")	**Mats** The comprehensivencss and complexity of SE contributed to more chaotic and less productive practice. **PSTs** The comprehensiveness and complexity of SE resulted in PSTs using time to understand the different elements in which contributed to a more chaotic and conflicting/ less productive practice. **Mats' pedagogy** SE, and especially the 'Complete guide to SE), influenced Mats' teaching in the living the curriculum approach, both contributing to the production of a student-centered approach but also to his feeling of being striated by the model. **Assemblage one (SE-PETE period one)** The comprehensiveness of SE and Mats' focus on all the teaching and learning elements contributed to a chaotic and less productive practice. **Assemblage two (PST practicum)** Depending of the PSTs degree of modification, SE contributed to divers teaching experiences. **Assemblage three (SE-PETE period two)** SE was more in the background, and Mats struggled to implement elements within each lesson.
Mats' pedagogy	○ Authentic SE season as teacher and learner (living the curriculum) ○ Reflect, critique and discus the SE model, and the teacher and learner experience (Discussion/reflection) ○ Work with the literature to develop SE season designs that PSTs can us as teachers (Coursework) ○ Consider PSTs needs and concerns within the assemblage (e.g., submission deadline) and across assemblages (Focus groups)	**Context** It was no tradition for living the curriculum and using 20 minutes of practical lessons for discussion/reflection, as well as providing PSTs comprehensive coursework that they had to do between lessons. This contributed to a conflicting/ less productive practice. **Mats** Pedagogy informed by Mats own beliefs about teaching and learning and his previous SE teaching experience. **PSTs** PSTs expectations and their shared experiences in discussion/reflecting and focus groups informed Mats' pedagogy. **Sport Education** Se model informed Mats' living the curriculum approach. **Assemblage one (SE-PETE period one)** Pedagogy informed by Mats' own beliefs about teaching and learning, struggle with the implementation of all the SE elements, while using a lot of time informing/explaining PSTs about various aspects of SE and his pedagogy (e.g., coursework). PSTs resistance to the discussion/reflection and struggle to understand the structure of his pedagogy. Pedagogy 'settle' after structure clarification, growing experience and change to familiar content (team handball). **Assemblage two (PST practicum)** PSTs teaching informed by their living the curriculum experience and team coursework. **Assemblage three (SE-PETE period two)**

		Pedagogy informed by his knowledge about teaching and learning; his philosophy; PSTs experiences in practicum (focus groups) and their expectations; his experience and understanding from the first period and believes about what the PSTs needed; year/block plan
SE-PETE period one assemblage	*Context* o No tradition for curriculum and instructional models. o Program and module goals o Focus in other modules (e.g., negative outcomes of competition – minimise its application in PE) o The specific module (SE-PETE) has traditionally focused solely on developing content knowledge and understanding related to untraditional games. *Content* o Focus on SE teaching and learning features, and how touch and team handball can be taught through the model. o Implement a full version of SE – all the suggested elements. o Main game techniques and tactics *Pedagogy* o 70 minute living the curriculum, 20 minute discussion/reflection and weekly coursework (building on the focus within LtC experience – e.g., selecting teams and roles). o Shared his reflective diary from lesson 9, 10 and 11 + teaching philosophy. o Provide a lot of information the first half of the period. o Small changes in lesson structure after lesson 7 (instead of starting lesson with equipment management and team warm up, he begins with equipment management, and lesson goals and criteria *Social dynamics* o Disconnection between Mats pedagogy and PSTs expectations o Both Mats and PSTs frustrated o Rivalry between PST teams o SE season and relationship between Mats and PSTs develops, while PSTs understand lesson structure – atmosphere develops positively *Mats' individualization* o Question the quality of own teaching – not feeling as a good role model as a SE teacher o Constant reflection on how to improve and carry out the discussion/reflection o Unsure about PSTs experiences, and was affected by PSTs non-verbal communication o Felt constrained by SE o Different becomings – striated, vulnerable, stressed, composed *PSTs* o Used time to understand the lesson structure and understand the TE-teacher and PST-student relat. o Critical towards the level of activity and think they are using too much time discussing/reflecting. o Do not fully appreciate that the main focus is on SE o Experienced Touch as complex (e.g., rules), and that it became too complex with all the SE elements. o Did not expect to be required to work between lessons, and experienced the workload as high. o Experienced M as well prepared and dedicated, and appreciated reading his reflective diary	**Assemblage one (SE-PETE period one)** Multiple constraining factors - Traditions in the context (PSTs expectations of content, lesson structure and pedagogy); Mats' limited experience, focus on/eager to have high degree of fidelity and playing and making the role as teacher educator; PST individualization (win at all costs, low fair play, no/limited SE experience); PSTs not understanding lesson structure; comprehensiveness and complexity of SE - all contributed to a chaotic and conflicting/ less productive practice where Mats was becoming-stressed, becoming-striated. Mats and PSTs familiarity with team handball; PSTs understanding lesson structure; development/ progress in SE season; growing relationship between Mats and PSTs, all contributed to a less chaotic and more harmonized practice where Mats was becoming-composed. **Assemblage two (PST practicum)** Mats' practice in assemblage one was informed by assemblage two (PSTs teaching SE in school). Mats aimed at providing PSTs with an authentic SE season allowing PSTs to experience the positive elements of SE, making them positive disposed to teaching SE in practicum. The discussion/reflection aim at allowing PSTs to understand the more about the hows and whys of teaching and learning SE, while the coursework should provide them with a template for teaching in practicum. **Assemblage three (SE-PETE period two)** To allow for a deeper understanding of SE, Mats planed for only two games in assemblage two and multiple inn assemblage three. Module tradition strongly informed choice of games in the two assemblages. Informing PSTs about the focus on different games in assemblage three facilitated the focus on SE in assemblage one.
PST Practicum assemblage	*Contexts* o 23 different classes, 600 students, general and vocational studies, 15-18 years old, 15 mentors	**Assemblage two (PST practicum)** PSTs teaching experience were influenced by the context (i.e., school facilities, mentor, students, expected and unexpected challenges) and the degree they modified SE - considering the contextual challenges they faced.

	Contextual challenges o Various expected and unexpected contextual challenges (sports hall, equipment, classes, cancelled lessons, 6 weeks) *Students* o Heterogenic classes o Various degree of SE appreciation *SE Teaching experiences* o Various experiences: Better-worse than expected, success-disaster o Because of the various contextual challenges the PSTs experienced, they modified their SE to different degrees o Surprised of the low skill level of student *Beliefs about teaching and learning* o SE either fit or not fit a class/student group	**Assemblage one (SE-PETE period one)** PSTs teaching was influenced by their experience in assemblage one and how they interpreted SE. The SE season design was used a templet. **Assemblage three (SE-PETE period two)** **Mats' pedagogy** as informed by the PST focus groups and practicum coursework in which PSTs shared their experiences of teaching SE and sharing what they expected and wanted to learn in the last SE-PETE period. Mats and the research team interpreted what the PSTs experiences, while considering what they considered relevant, when deciding on the focus of the last SE-PETE course. The practicum assemblage provided PSTs an authentic SE teaching experience that influenced the PSTs experience of assemblage three.
SE-PETE period two assemblage	*Context* o No tradition for curriculum and instructional models. o Program and module goals o Focus in other modules (e.g., negative outcomes of competition – minimise its application in PE) o The specific module (SE-PETE) has traditionally focused solely on developing content knowledge and understanding related to untraditional games. *Content* o Focus on introducing four untraditional nett- and invasion games. Nett- and invasion tactics, and related game techniques. o Implement SE elements in the lesson, while discussing them in the end of lesson (related PST reading assignment) *Pedagogy* o 70 minute exemplar-based living the curriculum approach, 20 minutes discussion/reflection, coursework (two submissions) o Changed focus on roles after lesson 2 *Social dynamics* o Mats and PSTs has agreed on lesson structure (PSTs acknowledge the discussion/reflection) o Good atmosphere, more casual *Mats' individualization* o Mats do not feel striated – inclined with SE o Struggle with and try to balance the relationship between SE and games o Feels PSTs appreciate lessons o Becoming- confident, becoming-calm. *PSTs* o Appreciate learning about various untraditional games, what they expected from the module o Feels that 'finished' with SE o Do not read the literature before lessons o Experience high degree of workload within the entire PETE program, and feels the SE coursework is a bit of an overkill.	Enabling factors, such as practice more in line with module tradition and PSTs expectations; PSTs acknowledgement of Mats' pedagogy, Mats and PSTs growing experience with SE; focus on games with SE in the background – contributed to a harmonised practice were Mats not was feeling as constrained (by SE). Constraining: PSTs finished with SE and not reading, Mats struggles to balance SE-games and what PSTs wants- what M think they need, Mats playing and making the role as teacher educator PSTs not reading – gjorde at M brukte mer dialog for at de skulle få det som han mente var viktig **Assemblage one (SE-PETE period one)** Relationship between M and PSTs – M modelling role as teacher (educator) Understanding pedagogy Growing SE knowledge Vulnerability **Assemblage two (PST practicum)** PSTs developed their knowledge of SE, formed their believes about SEs application in school; Mats considered their needs and concerns when deciding the content for assemblage three