



Developing a pedagogy of teacher education using self-study: A rhizomatic examination of negotiating learning and practice

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HIGHLIGHTS

- A conflux of elements (teacher educator, pre-service teachers, content, tradition, pedagogy) co-produced practice.
- When elements changed, the conflux of elements worked together differently, co-producing different practice and learning.
- The material and non-tangible world (e.g., content, tradition) influenced and produced practice and learning.
- The metaphor of 'orchestration' is introduced as a way of conceptualizing practice and pedagogy.

ARTICLE INFO

Article history:

Received 5 March 2019

Received in revised form

25 October 2019

Accepted 6 November 2019

Available online 19 November 2019

Keywords:

Deleuze

Orchestration

Professional development

Qualitative research

Teacher educator

ABSTRACT

This self-study of teacher education practices examines the processes of developing a pedagogy of teacher education. Drawing on multiple data sources (video and audio, reflective diary, and focus groups), we used concepts from rhizomatics to explore the question, "How does a teacher educator negotiate his learning and practice as he develops a pedagogy of teacher education?" We explicate the complexity of teacher education learning by showing how a conflux of interactive elements co-produce a teacher educator's practice. This encourages us to introduce the metaphor of "orchestration" as a way of conceptualizing teacher educator practice and pedagogy.

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1. Introduction

The development, learning and practice of teacher educators is under-studied and under-supported (Knight et al., 2014; Korthagen, 2016). It is therefore not surprising that, despite a general agreement among teacher education researchers about the importance of developing a pedagogy of teacher education (i.e., Loughran, 2006), such a pedagogy is in its infancy as an academic area (Korthagen, 2016). Those 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). In order to develop and articulate a pedagogy of teacher education, Loughran (2006) suggests it is necessary to address three main interrelated aspects: teacher educators teaching about teaching, pre-service teachers (PSTs) learning about learning, and PSTs learning about teaching.

Furthermore, Loughran (2006) pointed to the paradox that despite the obvious complexity of developing a pedagogy of teacher education, it is difficult to find studies that examine (in detail) the interrelated relationship between teaching and learning. There remains a lack of a well-developed knowledge base that explicates the assumed complexity of teacher educator practice and learning (Knight et al., 2014). While researchers have revealed some of this complexity (e.g., Goodwin et al., 2014; Superfine & Li, 2014), we argue that there is a need for research that deliberately considers teacher education practice and learning as a complex, relational, and interactive process (Strom & Martin, 2017).

The "self-study methodology" (LaBoskey, 2004) is advocated as

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a way for teacher educators to purposefully examine the complex and relational relationships in their practice. While challenges and affordances of self-study research have been identified by both community “insiders” and “outsiders” for elaboration, see (Bullock & Peercy, 2018), the approach has been identified as methodology and pedagogy for teaching about teaching and to support the ongoing professional development of teacher educators (Hamilton & Pinnegar, 2014). While there are examples of self-study researchers (e.g., Berry, 2007; Ní Chróinín, Fletcher, & O’Sullivan, 2017) who consider both teaching about 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.

Subsequently, in this study, we aim to deliberately exemplify the interrelated and complex processes of teacher education practice by examining the interactive processes of Mats’ (the first author and a doctoral student) practice as he develops a pedagogy of teacher education using self-study. Drawing on multiple data sources (video and audio, reflective diary, and focus groups) generated 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 as he develops a pedagogy of teacher education?”.

Specifically, we argue that this study represents an original and significant contribution to the development of a robust research-based knowledge base for, and shared understanding of, a pedagogy of teacher education. Using a novel conceptual framework to study teacher education practice and learning, we seek to highlight the complexity of teacher education by explicating how a conflux of elements (human, material, and non-tangible) co-produce a teacher educator’s practice. Arguing that a pedagogy of teacher education is a co-produced enterprise, we introduce the metaphor of “orchestration” (Jones & Wallace, 2005). This metaphor conveys the belief that many iterative changes in teaching are unmanageable, while demonstrating how to cope with such uncontrollability and contradictory influences that is part of practice.

2. Conceptual framework

To analyze learning and practice as a complex, relational, and interactive process, we engaged with rhizomatics (Deleuze & Guattari, 1987), a theoretical frame that emphasizes interactive relationships among a conflux of elements, conditions, and forces in a given social situation. 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.

An assemblage is machines or arrangements of heterogeneous human, material, and non-tangible elements, conditions or forces that interact in a particular way and context to co-produce something (e.g., teacher educator practice and learning) (Deleuze & Guattari, 1987). 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), discourses (the teacher educator’s expectations about the PSTs and vice versa), and traditions (the university, program, and course tradition) (De Freitas, 2012; Strom, 2015). Viewing teacher educator practice as co-produced by a classroom-assemblage means considering the conflux of elements, conditions, and forces (the teacher educator, the PSTs, the content, the traditions, the discourses, 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 become co-produced through the particular relationships and interactions between elements in the classroom. The concept of assemblage allows us to consider the teacher educator and PSTs as only two of multiple connected elements contributing to teacher educator practice. Further, the concept allows us to consider the relationship between teaching about teaching and learning about teaching, while discarding the notion of the teacher educator as an autonomous person that does teaching.

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

3. Elements influencing teacher educator practice

A systematic review of the self-study literature revealed how various elements, conditions, and forces in the classroom, university, and broader political institutions influence teacher educators’ practice (Vanassche & Kelchtermans, 2015). We argue that the way these 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 (Dowling, 2006; Superfine & Li, 2014), personal practical knowledge (Ross & Chan, 2016), perspectives (Lavay, Henderson, French, & Guthrie, 2012), and perceptions and expectations. For example, 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.

4. 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 complex 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 a pedagogy of teacher education (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.

4.1. The self-study team

Mats is the self-study teacher educator researcher. A 28-year-old Norwegian white male, Mats was a full-time doctoral candidate at the Norwegian School of Sport Sciences. From a middle class, countryside background, Mats 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 School of Sport Sciences 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. As part of the two-year doctoral program, Mats is expected to teach, and this teaching opportunity allowed him to study his practice of teaching PSTs about teaching physical education.

Mats’ beliefs and teaching practice has changed as he transferred from school teaching to teacher education. He practiced a predominantly teacher-centered approach as a teacher and entered the doctoral program with a rather linear view of teacher education. That is, the teacher educator is responsible for all the content knowledge PSTs are exposed to. Developing his doctoral project, Mats was introduced to, and started to acknowledge the need for, student-centered approaches to teaching and teacher education. At the start of this study, his pedagogy of teacher education was

developed during the first part of his doctoral study (Hordvik, MacPhail, & Ronglan, 2017). This involved teaching PSTs about teaching the ‘what’, ‘how’, and ‘why’ of teaching using explicit modeling (his approach is further explained under setting and throughout the findings).

Lars Tore (third author), Ann (second author), and Deborah (formal critical friend) functioned as a combined doctoral supervisory team and self-study critical friend team. Lars Tore served as the main supervisor and was located at the same university as Mats. Ann served as co-supervisor and was located in Ireland. Deborah functioned as Mats’ formal critical friend and resided within the same university as Ann. Mats was interacting with Lars Tore, Ann, and Deborah at different times and generally about different content. Mats interacted most frequently with Lars Tore about the data analysis, with Ann about study design and structure, and with Deborah about his teaching practice. Mats and Deborah held critical friends meetings weekly through e-mail and Skype during the two courses of this study.

4.2. Setting

The self-study setting is the three-year undergraduate physical education teacher education program at the Norwegian School of Sport Sciences. This study was undertaken through one university course divided into two periods, and PSTs’ school placements taking place between the two periods (see Fig. 1.). The university course was a self-selected seven-credit practical based course, named “Specialization in games”. The first period consisted of thirteen 90-min lessons, while the second period consisted of ten 90-min lessons. From the broad course goals focusing on didactical skills and innovation, Mats (in collaborate with the others on the self-study team) developed specific objectives that focused on learning how to teach games through a student-centered pedagogical model called Sport Education (Siedentop, Hastie, & Van Der Mars, 2011). Sport Education is a model for teaching school physical education that is grounded in a social constructivist view of teaching and learning, aiming to provide students with holistic, authentic, and meaningful sport experiences.

In teaching about teaching Sport Education, Mats used “explicit modeling” as his overall strategy (Lunenberg, Korthagen, & Swennen, 2007). This involved modeling the teaching of Sport

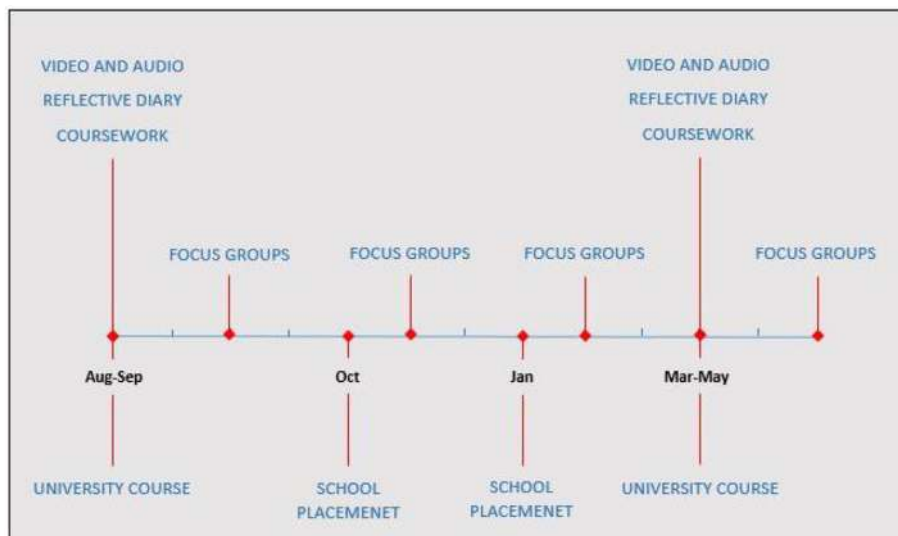


Fig. 1. Empirical work of the study.

Education, while aiming to make the pedagogical rationale behind his teaching explicit, and sharing the feelings, thoughts and actions accompanying his approach (Loughran & Berry, 2005). As a way to promote PST reflection that could enable PSTs to “analyze, discuss, evaluate and change their own practice”, p. 2 (Calderhead & Gates, 1993), Mats used three additional advocated techniques for his explicit modeling: (i) thinking aloud, (ii) writing a reflective diary that he shared with the PSTs, and (iii) discussions at the end of lessons (Loughran & Berry, 2005).

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 and 1000 students. The PSTs were divided into pairs and assigned a mentor. PSTs were required weekly to teach and actively observe their peer for 8 h, and undertake a shared 6 h of supervision with their mentor. Each of the PSTs were allocated at least one physical education class that they were required to teach using the Sport Education model.

Pre-service teachers. The twenty-one 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. While they reported positive experiences from physical education, sharing that they were skilled and received high grades, none had experience with Sport Education or other student-centered pedagogical models.

4.3. Data generation

Ethical approval for the study was granted from the Norwegian Social Science Data Services and each of the twenty-one PSTs signed a consent form. Data generation included observation of Mats’ teaching practice (audio-visual recording), his reflective diary, and focus groups with PSTs (see Fig. 1.).

We observed each lesson (23 lessons and a practical exam), resulting in 50 h of video recordings that allowed insights into the interactive processes of Mats’ 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 Mats synchronized the audio with the visual picture. The microphone captured all interaction between Mats 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 Mats 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 Mats’ reflections about critical incidences detected in the video recordings, his evolving experience as teacher educator, and how he perceived different elements (e.g., the PSTs, the course tradition, and the Sport Education model) to influence his teaching.

Twelve “focus groups” (Krueger & Casey, 2015), ranging between 50 and 100 min, were conducted with the PSTs. Three PST groups (seven PSTs in each group) 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., Mats and his practice, the Sport Education model, the program as a whole) influencing

their university course and school placement experiences.

Lars Tore was the main mediator of the focus groups, while Mats undertook facilitator and participant roles. Allowing Mats to engage in the discussion while prompting follow up questions when necessary, was made on the basis of two specific considerations. First, Mats’ experience with the PSTs would allow him to follow up on responses to questions with concrete examples from their shared learning experience. Second, the nature of Mats’ teaching (i.e., requiring PSTs to discuss and critique his teaching), and by assuring the PSTs that Mats’ aim was to understand and learn from their experiences, would encourage PSTs to share their genuine experience of the course.

4.4. Data analysis

Drawing on, and learning from, 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). This inductive approach involved reading the focus groups and reflective diary multiple times, while highlighting sections of interest and noting interactions in and between the data, and between the literature and the data. We also “walked” through all videoed lessons using the analytic data software program Interplay Sports. Our focus in walking through the data was on relationships, interactions, and processes rather than categories (Strom, 2014, p. 88).

The data software Inspiration was used to produce rhizomatic maps that are “flexible and show multidirectional relationships among elements within them” (Strom, 2015, p. 326). This was a two-stage process. First, we produced one map from each of Mats’ lessons. Second, we produced 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 data walking process into the maps, producing expandable “bubbles” containing each idea (Strom, 2015, p. 226). We then began grouping and drawing lines between main bubbles in ways that related to conditions of negotiating and producing teaching and learning (Strom, 2015), such as “negotiating with himself”, “material and non-tangible elements”, and “negotiating with PSTs”.

We used situational analysis to produce organized situational charts which named “who and what” matter in the three periods of the study, including the major human, material, and non-tangible elements present in the three courses (Clarke, 2003; Strom, 2014). We then elaborated the relationships and interactions produced 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, conditions and forces that shaped Mats’ practice and learning (Strom, 2014, p. 91). 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” (Strom, 2014, p. 93).

After making sense of the connections, relations, and interactions within each of the three periods, we engaged in a synthesis process where we produced one rhizomatic map (see Fig. 2.), while elaborating on the relationships and interactions produced within the rhizomatic maps (the social negotiations), and wrote analytic memos. This process helped us produce an understanding

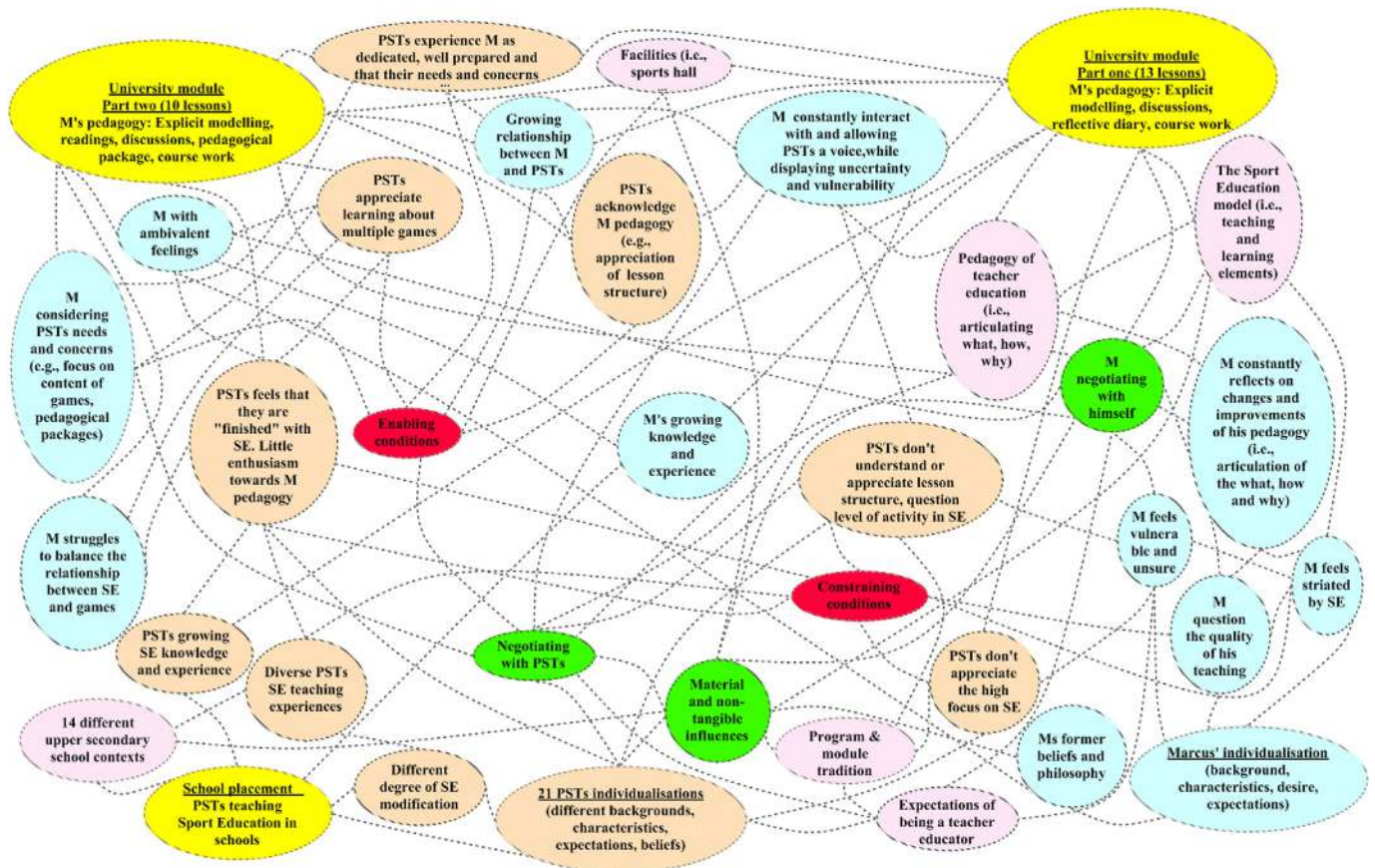


Fig. 2. Modified synthesised rhizomatic map.

of the connections and interactions across the three periods. Finally, the synthesis memos were used to further develop the main themes and produce lengthier descriptions of practices, situations, and events that would later support the key findings (Strom, 2015, p. 326).

5. Findings

To demonstrate the complexity of teacher education practice and learning, we focus on Mats' self-study as he worked to better understand and develop a pedagogy of teacher education. Mats was teaching PSTs about teaching through a university course, divided into two periods with a PST school placement in between. We argue that the ways particular human (i.e., Mats and the PSTs), material (i.e., the Sport Education model, literature on teacher education pedagogy), and non-tangible (i.e., expectations of articulating the what, how, and why, the course tradition) elements in the practice interacted help explain the degree to which Mats and the PSTs could engage in meaningful practice of teaching about teaching and learning about teaching. Furthermore, we contend that evolving learning experiences combined with Mats continuously negotiating the conflux of interactive elements with the PSTs and with himself, worked to change Mats' practice and the relationship between teaching and learning.

In developing our case, we first describe the interaction between Mats, the PSTs, and the material and non-tangible elements influencing the relationship between teaching and learning in the beginning of the first university period and convey the way they constrained Mats' teaching. We then examine how Mats negotiated the conflux of human, material, and non-tangible elements with

the PSTs throughout the two university courses and the way PSTs' evolving experiences changed the way the conflux of elements interacted in Mats' practice. Last, we examine the way Mats negotiated with himself with respect to the conflux of elements influencing his teaching practice, and show how these processes combined with his and the PSTs' evolving experience changed the way he was teaching and learning.

5.1. Material and non-tangible elements influencing practice

While some elements (size of sports hall, equipment, number of lessons) worked to enable Mats' practice, three interconnected material or non-tangible elements in the setting produced constraining conditions for the relationship between teaching and learning about teaching: (i) the nature of teacher education pedagogy, (ii) the Sport Education 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 Mats' practice at the outset of the first period.

First, engaging with the literature on teacher education pedagogy (e.g., Loughran, 2006) produced expectations in Mats' 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 Deborah (formal critical friend), Mats decided to use an overall twofold lesson structure. In the first 70 min of lessons, he aimed to model teaching of the Sport Education model, while providing insights to PSTs as prospective teachers. In the last

20 min, he aimed to engage PSTs in reflection and discussion about the model, his teaching and their experiences as learners. Mats 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 Mats’ practice, connecting with his limited experience of teaching PSTs about teaching, made it challenging to teach the content of the Sport Education model, how to teach through the model and the why of the different teaching and learning aspects. After the first period, Mats reflected on the interconnection between his background and the teacher education requirements, and how that 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 (teaching about teaching). Because I have a desire to articulate both the what, how, and why I need 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, Mats and the PSTs’ level of familiarity with Sport Education, and the way it connected with Mats’ desire to articulate the nature of teaching, constrained Mats’ practice. Except from a course Mats taught to six of the PSTs the year before (Hordvik, MacPhail, & Ronglan, 2017), Mats and the PSTs had limited or no experience with Sport Education. Because the model is compressive and complex (Hordvik, MacPhail, & Ronglan, 2017) with multiple concrete teaching and learning features (e.g., having students in stable teams and roles other than that of a player), Mats’ 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 Mats believed Sport Education facilitated him modeling 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 has 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 produced strong expectations in the teaching and learning environment. The program in general was not focusing on specific student-centered pedagogical models, and practical courses at the university were traditionally aimed at teaching PSTs solely about content and teacher-centered didactics. 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. Interacting with the course tradition (through dialogue with the former teacher educator and previous PSTs), combined with PSTs limited experience with student- and PST-centered pedagogy, the PSTs expected 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 Mats’ practice, “We feel there’s a lot of talk first and then we have some physical activity, then it’s 10 min talk again and then some physical activity and 10 min talk again ... [Where is] the joy of movement?”.

Together, the interactions between the human, material, and non-tangible elements in the setting - that is, (i) Mats’ desire to teach in a student- and PST-centered way and to articulate the nature of teacher education practice, (ii), Mats and the PSTs’ limited experience with the comprehensiveness of the Sport Education model, and (iii) PSTs’ expectations towards the content and activity tradition of the program and course, and Mats’ actual teaching – co-produced conditions where Mats constantly had to negotiate

the conflux of interacting elements with the PSTs and himself.

5.2. Negotiating with the PSTs

First university period. Because of their sport background, PSTs were used to experiencing mastery in physical education. Combined with their unfamiliarity with Sport Education (and other student-centered pedagogical models) and strong expectations of the course content and practice, PSTs became critical of Mats’ practice in the beginning of the first period. As a way to develop a meaningful relationship between teaching and learning, Mats 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, Mats was trying to make them acknowledge the Sport Education 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 Sport Education model, his teaching of it (i.e., modeling), and their experiences as learners. The following extract from a lesson show how Mats’ practice allowed PSTs to scrutinize his teaching, while providing an opportunity for him to adapt the Sport Education 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 ...

Mats: “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, the vulnerability of Mats’ 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’ shared experiences and suggestions. The discussion referred to above made it clear for Mats 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. Mats’ 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, Mats 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 about teaching and learning about teaching. Scott explained, “When he [Mats] 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 Mats’ vulnerability, fostered a more meaningful practice and engagement. Jack explained how Mats’ practice enabled his

relationship with the PSTs,

It's important that we don't experience that there is one correct answer. For example, when Mats 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.

As supported by the extracts above, our analysis conveys that by constantly interacting with and allowing PSTs a voice, while displaying uncertainty and vulnerability, produced conditions where PSTs started to acknowledge Mats' teaching practice and perceive him not only as an expert teacher (educator) but as a human and learner (in a similar way to how they positioned themselves). This resulted in a growing relationship between Mats and the PSTs and, combined with their growing experience with the Sport Education model, the interaction between the conflux of human, material, and non-tangible elements changed. The conflux of elements were co-producing meaningful relationships between teaching about teaching and learning about teaching.

Second university period. Our analysis of the second university period conveys the way PSTs' evolving experiences – that is, the first university period and school placement – interacted with the other elements in the setting and produced both enabling and constraining conditions in Mats' 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 Sport Education model. In the focus groups before the second university period, they therefore strongly encouraged Mats to focus on the content of multiple games and pay less attention to the model as such. Subsequently, the interaction between the course tradition (focus on the content of games) and PSTs' expectations, combined with Mats stretching to align his practice with the PSTs' needs and concerns, co-produced a setting where 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, the interactions between the conflux of elements in the setting produced conditions where they showed limited engagement when Mats tried to encourage them to discuss features of the Sport Education model or the nature of teaching. This lack of enthusiasm constrained Mats' practice within which he tried to negotiate with the PSTs about the relationship between the content of games, Sport Education, and the nature of teaching. We observed how Mats 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 developed "pedagogical packages" that 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). Mats 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 Sport Education model (e.g., meaningful competitions, teaching strategies) that he further integrated into the lesson, and discussed at the end of lessons. However, the tradition of both the course (focus on content of games) and program/university (no expectations of reading before

practical lessons) influenced PSTs' expectations. Combined with their evolving learning experience, PSTs rarely read the literature, showed low enthusiasm towards the model features and in discussions about the nature of teaching. This co-produced conditions where Mats struggled to develop a worthwhile relationship between teaching about teaching and learning about teaching. Abby's comment provides insight into the ways PSTs' evolving experiences, effort, and expectations worked against Mats' effort to engage them in more in-depth discussion about the Sport Education model and the nature of teaching,

I felt I had used a lot of time learning about it [Sport Education]. 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.

5.3. Mats' internal negotiations

First university period. In developing a pedagogy of teacher education, Mats 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. The way his different practice ambition – that is, different from his established teaching practice, different from the program and course tradition, and different from PSTs' expectations – interacted with the PSTs, and the material and non-tangible elements, co-produced conditions in the first university period where Mats needed (as a way to cope with the ambiguity in his practice) to negotiate between his own personality, the Sport Education model, and his former and current philosophy.

"Optimality" was prominent in Mats' reflective diary, reflecting his strong desire to maintain the fidelity of the Sport Education 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 Sport Education (i.e., stable teams and multiple roles such as coach, score keeper, and journalist) to PSTs as prospective teachers before explaining why he had chosen to do so. Mats' 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 students and PSTs" (Reflective diary, lesson five). Furthermore, Mats' continual strive for perfectionism also made him overly conscious of the way PSTs perceived the model and his practice. Conscious of the interaction between the tradition, PSTs' expectations, and the complexity of his teaching practice (articulating the what, how, and why, while requiring PSTs to use a large amount of time reflecting and discussing), during lessons Mats 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 Sport Education model represented a different teaching practice and was important for Mats in developing a new philosophy (from teacher-centered teacher to PST-centered teacher educator). However, because of Mats' limited experience with the model, when modelling teaching of Sport Education, he experienced the expectations produced by the model as challenging. For example, Mats felt he lost control when allowing PSTs responsibility for their own learning (e.g., PSTs responsible for carrying out team drills). He became unsure about his role as teacher (educator) within the model. Because of his unfamiliarity with the

Sport Education model, Mats questioned how a student-centered 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 [modelling teaching of the model], however, sometimes I would have preferred having some preferences" (Reflective diary, lesson four).

In his previous practice as a teacher, Mats 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 Sport Education, he now tried to allow PSTs time to collaborate and experiment (e.g., using time to organize team drills), 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. Mats reflected on how his former practice influenced and produced 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 Mats 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 Mats 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 the PSTs, and the material and non-tangible elements interacted with Mats and his internal struggles and negotiations. That is, his eagerness to teach perfectly, overly packed lessons, feelings of losing control, sensing the PSTs' frustration, feeling the need to teach the what, how, and why, and feeling vulnerable produced 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)

Second university period. There was a striking difference in Mats' internal negotiations between the first and second university period. The struggles, negotiations, and experiences throughout the

first period, combined with Mats considering PSTs' needs and concerns for the second period (focus on content of games), produced an environment in the second university period where he appeared as a more secure teacher educator. That is, the initial university period allowed Mats to develop his relationship with the PSTs. He also developed his familiarity with the Sport Education 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. Together, 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, Mats explained how the interaction between these changing elements produced 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 twenty-two)

While Mats experienced confidence in his practice, our analysis show how the changing elements and their interaction produced a teaching practice that appeared less different – that is, more similar to his previous established practice, similar to the program and course tradition, and similar to PST expectations. The interaction between these elements, combined with the PSTs' previous learning experiences, produced conditions where Mats experienced not being able to engage PSTs in the Sport Education model and the nature of teaching. He therefore constantly engaged in an internal negotiation based on the tensions produced by the conflux of elements. The following reflection shows the interaction between the elements and how this produced 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 Sport Education today. It's difficult to balance 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 the why and how of my teaching. (Reflective diary, lesson fourteen)

6. Discussion

By deliberately considering the complex, relational, and interactive processes of teacher educator practice (Strom & Martin, 2017), we have extended prior research on the complexity of teacher educator learning (e.g., Goodwin et al., 2014; Superfine & Li, 2014), contributing to the knowledge base of teacher education by explicating the complexity of teacher educator practice and learning (Knight et al., 2014). Specifically, this study suggests a different interpretation of the complexity of teacher education. That is, one that attends to the whole and not pieces of teacher education pedagogy (Cochran-Smith, Ell, Ludlow, Grudnoff, & Aitken, 2014). We contend that the interactions between a conflux of human, material, and non-tangible elements influence teacher educator practice, and the relationship between teaching about teaching and learning about teaching. By conceptualizing and analyzing teacher educator practice as assemblage, teacher education (practitioner) researchers can better understand the complex relationships influencing and co-producing a pedagogy of teacher education (Loughran, 2006; 2008). Specifically, teacher education (practitioner) researchers can better understand the way

material and non-tangible elements, and their interactions with human elements, influence the relationship between teaching about teaching and learning about teaching.

Extending the concept of “assemblage” (Deleuze & Guattari, 1987) to this study, the conflux of interacting elements, conditions, and forces in Mats’ two university periods can be considered classroom-assemblages, each functioning to construct specific practice and learning. As such, while researchers have shown how different elements influence teacher educator practice (e.g., teacher educator, Cutforth, 2013; PSTs, Sosu & Gray, 2012; professional context, Korthagen et al., 2006), we have used assemblage to explicate the complexity (Knight et al., 2014) by showing how a conflux of interacting elements influence and co-produce teacher educator practice and the relationship between teaching and learning. The elements influencing Mats’ classroom-assemblages included Mats himself (his desire to teach perfectly while articulating the what, how, and why of teaching, level of familiarity with the Sport Education pedagogical model, and limited experience as a teacher educator), the PSTs (their level of familiarity with Sport Education, expecting a focus on content and being used to teacher-centered approaches and to experiencing mastery in physical education), the Sport Education model (its multiple concrete teaching and learning features), the program and course tradition (no use of particular student-centered pedagogical 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). We now discuss the function and production of Mats’ classroom-assemblages.

A rhizomatic lens (Deleuze & Guattari, 1987) allows us to appreciate and consider the way both the material (e.g., pedagogical models) and non-tangible world (e.g., traditions), influence and produce teacher education practice and learning (Hultman & Lenz Taguchi, 2010; Strom & Martin, 2017). In Mats’ practice, this is illustrated by the ways the program and course tradition, the nature of teacher education pedagogy, and the Sport Education model interacted with Mats and the PSTs, and influenced Mats’ practice, and the relationship between teaching about teaching and learning about teaching. For example, the program and course tradition produced strong expectations towards the course content and Mats’ practice. Challenging the tradition to its limits in the first period produced PST resistance and a vulnerable awareness in Mats’ practice. Negotiating with the forces of the tradition, Mats 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 learn about the content of games. As a way to retain his evolving relationship with the PSTs in the second period, Mats chose to adjust the content and his practice with respect to the tradition. The assemblage elements were changing, the classroom-assemblage was co-producing different practice and relationships.

Using “assemblage” as an analytic construct may generate a more nuanced understanding of the different tensions in teacher educators practice (Berry, 2007), and a different consideration of the complex relationship between teaching about teaching and learning about teaching (Loughran, 2006). In the beginning of the first university period, multiple interacting elements constrained Mats’ practice. For example, Mats’ limited experience of teaching about teaching, and his and the PSTs’ limited experience with the oppressiveness of the Sport Education model. Combined with Mats’ personality (i.e., desire to teach perfectly and articulate the nature of teaching) and beliefs (resulting in him implementing multiple features of the Sport Education model, while using time explaining such beliefs to PSTs as prospective teachers, and requiring PSTs to use time on discussion), the conflux of interacting elements worked together to co-produce a chaotic practice. The complexity

overwhelmed Mats. 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 Mats’ practice. This produced a tense social dynamic between Mats and the PSTs, working to constrain the relationship between teaching about teaching and learning about teaching.

From a rhizomatic perspective (Deleuze & Guattari, 1987), when particular elements, conditions or forces in the classroom-assemblage changes, the conflux of interacting elements work together differently, co-producing 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) Mats was able to identify some of the interacting elements constraining his practice. Combined with the evolving teaching and learning experiences, Mats and the PSTs agreed about the lesson structure, while developing their understanding of the multiple features of the Sport Education model. Together, this enabled Mats’ practice, with him and the PSTs developing meaningful relationships.

While the evolving experiences and relationships from the first period and PSTs’ teaching experiences from school placement deepened the relationship between Mats and the PSTs in the second period, multiple elements worked to constrain Mats’ aim to articulate the what, how, and why of teaching. The traditional content focus of the course, together with PSTs’ evolving familiarity with the Sport Education model, made them encourage Mats to focus on content in the last period. Considering the amount of PST resistance throughout the course as a whole, Mats chose to align his practice with the PSTs’ needs and concerns. This was also in line with Mats’ former established teaching practice. The interaction between these elements contributed to co-produce a pleasantness in the teaching and learning environment. In such a setting, Mats became confident, and noticeably less persistent in his attempts to engage PSTs in meaningful practice about the nature of teaching.

6.1. Implications for teacher education practice and research

This study was guided by the question, “How does a teacher educator negotiate his learning and practice as he develops a pedagogy of teacher education?” We have explicated the way Mats negotiated his learning and practice, highlighting how his practice and learning was highly interactive, relatively uncontrollable, multi-directional, and filled with ambiguities, resistance, and tensions. We present two related conceptualizations for Mats’ developing pedagogy that we argue provide implications for other teacher educators’ practice and the continuous development of a pedagogy of teacher education.

Developing a pedagogy of teacher education is about understanding the complex interplay between human, material, and non-tangible elements. Thus, while it is important to understand the tensions in teacher educator practice (Berry, 2007), and the relationship between teaching about teaching and learning about teaching (Loughran, 2006), this study suggests that teacher educators need to understand and appreciate their classroom-assemblage. That is, the way multiple human, material, and non-tangible elements connect and interact in their classroom, co-producing the tensions in their practice and the dynamic relationship between teaching and learning. Conceptualizing teacher education practice as assemblage provides teacher educators and researchers with a theoretical frame to investigate and describe the elements, conditions, and forces co-producing the relationship between teaching and learning.

We argue that conceptualizing teacher education practice as assemblage posits teacher educators as prominent figures who,

although influenced by a variety of elements and forces, are engaged in continuously “orchestrating” practice and learning towards desired outcomes (Jones & Wallace, 2005; Wallace, 2003). As an orchestrator of a relational, interactive, and relatively uncontrollable process (Jones & Wallace, 2006), the teacher educator initiates PSTs’ learning before reinforcing or guiding 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 occurrences in the setting (Jones & Wallace, 2006). Teacher educators therefore need to be conscious of the details of the interactions within the classrooms (e.g., comments or emotional expressions) (Mason, 2002). Further, teacher educators need to be able to understand such signs and make adjustments that potentially can keep the process on track and channel the learning in desired directions.

Additionally, being realistic about the relational nature of teacher education implies accepting that it is beyond the agency of teacher educators to eliminate uncertainty, ambiguity, and unpredictability from their practice. 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 and produced by their classroom-assemblage.

Consequently, we encourage teacher educators to acknowledge the relatively uncontrollable, relational, and ambiguous environment of teacher education practice and learning, and in this way embrace orchestration as a way of conceptualizing their practice and learning. We argue that such a conceptualization provides teacher educators with a frame for both exploring and understanding practice and coping with the ever-changing nature of teaching, and a language for describing practice in their effort to teaching about teaching.

Finally, we argue that there is a need for research that provides a more sophisticated grasp of the complexities of teacher educator practice and the development of a pedagogy of teacher education. Researchers are encouraged to focus on and investigate the dynamic processes of practice and learning, and the ways teacher educators engage with their complex environment. How do teacher educators cope with the ambiguities in their practice? How do they orchestrate their practice and learning and by association PSTs’ learning processes? This requires researchers to engage in rich qualitative studies and with nonlinear frameworks (e.g., rhizomatics) where they deliberately seek to better understand the relational, interactive, and uncontrollable nature of teacher education practice and learning (Strom & Martin, 2017).

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Acknowledgments

The authors would like to thank Kathryn Strom for educating us in rhizomatic inquiry, contributing to the analysis process, and reviewing an earlier draft of the paper.

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