Routledge
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A collaborative approach to teaching about teaching using models-based practice: developing coherence in one PETE module

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ABSTRACT

Background: The current interest in models-based practice (MBP) as an innovation and framework has necessitated deeper understanding of both what MBP is and how teacher educators teach pre-service teachers about innovative approaches such as MBP. Despite several studies of individual teacher educators enacting MBP, there are few examples of how several teacher educators might go about implementing MBP in physical education teacher education (PETE) programmes.

Purpose: The purpose of this study was to develop an understanding of how a collaborative approach to teaching pre-service teachers MBP can support coherence in PETE modules. The study was guided by the question: How do teacher educators teaching in one PETE module negotiate their experience of teaching about teaching as they implement MBP?

Method: This collaborative self-study of teacher education practices was conducted in a Norwegian PETE department and involved five teacher educators. The particular setting for the study was one module (what might be described elsewhere as a course or unit of study) that Lasse, Berit, Anders, and Mats were to teach to first year pre-service teachers in one PETE programme (13 females and 37 males). In addition to teaching the module, the four teacher educators acted as critical friends to one another, while Tim (who was based in Canada) offered a second layer of critical friendship to group members both individually and collectively. Data generation included two primary sources: audio records of our meetings in different configurations (21 meetings and approximately 35 hours audio) and our reflective diaries (total of 10 entries and 20 pages). Data analysis involved a five-step dialogic process of 'thinking with' Loughran's (2006. *Developing a Pedagogy of Teacher Education: Understanding Teaching and Learning About Teaching*. London: Routledge) concept of developing a pedagogy of teacher education (Jackson, A. Y., and L. A. Mazzei. 2012. *Thinking with Theory in Qualitative Research: Viewing Data Across Multiple Perspectives*. London: Routledge).

Results: This study provides insights into the affordances of taking a collaborative approach to teaching about teaching MBP and how such a collaborative approach facilitated implementation individually and collectively. Furthermore, the study highlights the ways the several collaborative processes and structures produced the development of a

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shared language and vision for teaching about teaching MBP. This shared vision led to coherence in how we talked and taught about MBP with each other and with pre-service teachers. These visions helped make our individual and collective practices and their articulation coherent to ourselves and to one another, and also to the pre-service teachers whom we taught.

Conclusion: Our understanding is that the development of coherent PETE programmes and the modules within those programmes requires at least: (i) a professional group of teacher educators who are willing to share their understanding, challenges, and uncertainties with one another and with pre-service teachers, (ii) an inquiry-oriented stance towards researching group and departmental beliefs and practices, and (iii) a desire to better understand and share the development of new understandings with colleagues at departmental, national, and/or international levels.

Background and purpose

According to Casey (2014), the time to ask if models-based practice (MBP) works has passed. Along with strong philosophical and historical arguments (e.g. Kirk 2010; 2013), there is a developing base of evidence to support its role in a vision for reform and renewal in physical education. As a result, Casey (2014) suggests there is now a need to better understand how such an approach might be sustained in the long-term. Several authors suggest that teacher educators play a crucial role in leading change efforts in any context (Goodwin and Kosnik 2013; Smith and Flores 2019), and this claim similarly holds if MBP is to achieve any sustainability (Gurvitch, Metzler, and Lund 2008). However, this can be a challenging task to many teacher educators, as MBP is often as new to them as it is to practicing teachers in the field. For example, Fletcher and Casey (2014) and Hordvik, MacPhail, and Ronglan (2017) explained the challenges faced in modelling MBP to pre-service teachers when a teacher educator has limited or no experience seeing or implementing MBP in schools. In addition, teacher educators are faced with addressing challenges presented by their own socialisation (Lortie 1975), whereby pre-service teachers enter teacher education with expectations that what and how they will learn will be similar to their experiences as pupils in K-12 schools, which typically did not involve MBP. In other words, many pre-service teachers 'seek the familiar' practices they were exposed to in schools (Loughran 2006) in their PETE programmes and often struggle to open themselves up to new and alternative ways of doing and thinking about teaching and being a teacher. As a result, teacher educators are required to challenge not only pre-service teachers' expectations of learning to teach but also their own pedagogies of teacher education (Hordvik, MacPhail, and Ronglan 2020; Bullock 2009; McEvoy, MacPhail, and Heikinaro-Johansson 2015; Richards and Sinelnikov 2019; Ritter 2007). This represents a complex undertaking for both teacher educators and pre-service teachers (Casey and MacPhail 2018).

In implementing MBP in their respective PETE programmes, Fletcher and Casey (2014) used self-study of teacher education practice (S-STEP) methodology to help them articulate the 'hows and whys' of teaching using MBP to themselves, to each other, and to the pre-service teachers whom they taught. They demonstrated how the reflective and dialogic processes inherent in S-STEP aided their own understanding of the challenges of teaching about teaching using MBP and some of the challenges faced by pre-service teachers in learning about teaching using MBP. In order to move beyond descriptions of their own challenges faced, they called upon other teacher educators involved in PETE to not only articulate their knowledge and understanding of PETE practice in their own local contexts so the knowledge base is built, but to share how they developed that knowledge so that others may learn from their experiences. This call was taken up by Hordvik et al. (2017; 2020), whose S-STEP research conveyed the various tensions inherent in PETE, and

emphasised the importance of examining the interdependent worlds of teaching about teaching (teacher educator) and learning about teaching (pre-service teachers). Similarly, Baker and Fletcher (2017) described both the value and complexity in pre-service teachers learning *about* MBP while also learning *through* MBP; that is, pre-service teachers not only need to learn about the theories and ideas underpinning pedagogical models, they also need to experience what it is like to be in the learner's shoes as they engage with the models (Curtner-Smith, Hastie, and Kinchin 2008). This is similar to descriptions of 'living the curriculum', where pre-service teachers experience the same or highly similar approach that their students will (Dillon, Tannehill, and O'Sullivan 2017; Oslin, Collier, and Mitchell 2001; Sinclair and Thornton 2018). While this approach can lead pre-service teachers to develop a deeper understanding of MBP, it can also lead them to feel overwhelmed and lacking confidence to enact MBP when they enter school teaching placements because they need to experience those pedagogies as both students *and* teachers (Baker and Fletcher 2017; Gurvitch, Metzler, and Lund 2008; Dillon, Tannehill, and O'Sullivan 2017).

While these studies have contributed to a foundation for the knowledge base of implementing MBP in PETE programmes, they typically represent the experiences of individual teacher educators within departments. If MBP is to be taken up by pre-service teachers, there is perhaps greater likelihood they will do so when it is presented in a coherent way by several teacher educators within a department. Coherence has been identified as a central pillar of powerful teacher education programmes (Darling-Hammond 2006; Klette and Hammerness 2016), and so it follows that this principle should also apply when thinking about implementing MBP in PETE programmes. This perspective was taken by Gurvitch, Metzler, and Lund (2008) who examined the way MBP supported a coherent PETE programme at Georgia State University in the United States. While Gurvitch, Metzler, and Lund (2008) showed positive outcomes for pre-service teachers and many of the pupils they taught in schools, there was no consideration of the voices of the teacher educators who taught in the PETE programme, leaving a lack of clear direction of the processes and experiences of implementation for others who may want to replicate something similar. As such, there remains little evidence of how groups of teacher educators might go about implementing MBP in a PETE programme or the modules that make up PETE programmes (what might be described elsewhere as the individual courses or units of study), particularly in terms of the personal and collective dilemmas, challenges, and facilitators inherent in their experiences of implementing an innovation at the departmental level. Subsequently, acknowledging the need to understand how teacher educators teach pre-service teachers innovative approaches such as MBP (Casey 2014), the purpose of this study was to develop understanding of how a collaborative approach to teaching pre-service teachers MBP can support coherence in PETE modules. Our research was guided by the question: How do teacher educators working in one PETE programme negotiate their experience of teaching about teaching as they implement MBP? This study represents an original and significant contribution to the development of a knowledge base for, and shared understanding of, the implementation of MBP in PETE. By studying the collaborative processes of implementing MBP in a PETE module, we seek to explicate the collaborative processes, and subsequent affordances, of taking such an approach. Furthermore, we highlight how our inquiry-based and collaborative approach allowed us to develop a shared and multi-layered vision for teacher education practice which subsequently produced coherence in our collaborative teacher education practice.

Conceptual framework: developing a pedagogy of teacher education

According to Loughran (2013), a pedagogy of teacher education 'can be viewed as the theory and practice of teaching and learning about teaching' (129). The idea of a pedagogy of teacher education draws from multiple theoretical frames including reflective practice (Schön 1983), teacher socialisation (Lortie 1975), and constructivism. In order to develop and articulate a pedagogy of teacher education, Loughran (2006) suggests it is necessary to address three main inter-related aspects: teaching about teaching, learning about learning, and learning about teaching. In teaching about teaching,

Loughran (2006) identifies the important role that teacher educators play in teaching pre-service teachers through the use of appropriate pedagogical strategies in the classroom. Modelling of appropriate practice, however, is necessary but not sufficient in powerful approaches to teacher education practice:

> … a teacher educator needs to be capable of, and actively pursue, making the tacit nature of practice explicit so that the teaching-learning relationship is able to be seen, experienced and inquired into rather than superficially viewed as a simple set of routines and/or procedures. (Loughran 2013, 130)

There is therefore a need for teacher educators to describe their modelling, outlining the reasons underpinning their pedagogical decisions while also making those decisions open to debate and critique based on pre-service teachers' experiences of learning. This requires consideration of myriad aspects of the pedagogical situation, including, for example, awareness of context, pre-service teachers' needs and interests, pre-service teacher motivation, planning and selection of content and teaching strategies, challenges pre-service teachers face with certain content, and so on. It may seem clear then that this is often easier said than done. Therefore, pre-service teachers' experiences of learning about learning from a teacher educator's teaching about teaching can support them in identifying how content and pedagogical strategies may be experienced by their own pupils in the classroom. As they learn about learning, pre-service teachers are simultaneously learning about teaching in terms of content and pedagogy, developing a heightened awareness of the nature of teaching and its complexity based on the array of decisions and actions they make as teachers that affect a given pedagogical situation (Loughran 2006). In articulating their personal pedagogies of teacher education, teacher educators' practices thus become a site for inquiry for both the teacher educators and pre-service teachers in terms of the inextricable and reciprocal relationship between teaching and learning as experienced by both learners and teachers of teaching (Loughran 2013). However, when teacher educators who teach in the same programme share their pedagogies of teacher education with each other, this opens a more complex web of beliefs, practices, interpretations, and understandings that can make it difficult to present a coherent approach to teacher education or to a pedagogical innovation, such as MBP. Beyond the difficulties it may also open up new avenues for inquiry and understanding of teaching and teacher education practice for both teacher educators and pre-service teachers.

Methods

Our inquiry is grounded in collaborative self-study of teacher education practice (S-STEP) methodology (Pinnegar and Hamilton 2009). In keeping with LaBoskey's (2004) guidelines for quality in S-STEP research design, our inquiry was: (i) self-initiated, (ii) focuses on our own collaborative teaching and research practices, (iii) interactive, (iv) drawn from multiple qualitative data sources, and (v) based on richly descriptive examples to describe the key themes, ideas, and transformable moments. An important consideration in collaborative forms of S-STEP is navigating the balance between the voices and experiences of the individual teacher educators engaged in the research, as well as any 'collective self or selves' that might emerge from the research process. We attempted to navigate this through our collective involvement in data generation, data analysis (e.g. member-checking), and in writing this article.

Context

We share similarities in the approaches taken to collaborative S-STEP by, for example, Tannehill et al. (2015) whose study was conducted in Ireland, and Luguetti et al. (2019) whose inquiry involved teacher educators from Brazil, Mexico, and the US. Like those researchers, we acknowledge the important role context plays in any type of S-STEP research, and the value of establishing a contextual grounding so that others may establish degrees of resonance with the processes and results

described. Mats, Berit, Lasse, and Anders were working in a PETE programme at Oslo Metropolitan University (OsloMet) in Norway. In addition to teaching the classes together, for the purposes of this research the four of us acted as critical friends to one another. Tim was working at Brock University in Canada and offered a second layer of critical friendship; this involved being critical friend to the group and, at times, to the individuals within the group (Fletcher, Ní Chróinín, and O'Sullivan 2016; O'Dwyer et al., 2019). Tim was keen to position his role not as an outside or arm's length expert, but as a collaborator interested in learning about the innovation and the group process. Mats served as the project organiser and was a new member of the department at OsloMet. He had over two years prior experience as a secondary school physical education teacher and 11 years' experience as a junior team handball coach. Lasse functioned as module leader. He had worked at OsloMet for 7 years, and prior to that had 18 years experience as primary and secondary school physical education teacher and 14-years experience as senior and junior soccer coach. Berit had worked at OsloMet for 22 years and had 17 years experience as a 'folk high schools' teacher (these are institutions for adult education that generally do not grant academic degrees). Anders had worked at OsloMet for 5 years and had 3 years experience as primary school physical education teacher. While Mats' job description stated that his work was divided between teaching (65%) and research and development (35%), the three others had 80% of their workload for teaching and 20% for research and development. This discrepancy in research and teaching loads carried important implications for how the inquiry was conducted and its outcomes, particularly around individual and collective identities. Tim taught in secondary schools for five years prior to higher education, in which he has taught in for 10 years. Mats defended his PhD three months before this research project, where he used S-STEP as methodology-pedagogy, focusing on his teaching and pre-service teachers' learning of Sport Education (Hordvik 2018). Tim has also been involved in several collaborative self-studies investigating MBP; however, the others in the group were new to both S-STEP and MBP at the time the inquiry began.

Setting. The particular setting for our S-STEP was a module called 'Curriculum and Teaching' that Lasse, Berit, Anders, and Mats were to teach to two classes of first year PETE undergraduate pre-service teachers (8 females and 17 males in one class, and 5 females and 20 males in the other) at OsloMet. The total teaching time allocated to the module was 646 hours (including planning, teaching, supervision, and assessment), which could be divided and allocated between ourselves. The module description states that pre-service teachers will learn about the pedagogical process that goes from interpreting the curriculum to planning, executing, and evaluating teaching and learning. The pre-service teachers' learning experiences involved 90 hours of face-to-face teaching, which was carried out in a mixture between sports hall/gymnasium and classroom. Our MBP approach involved three pedagogical models: Teaching Personal and Social Responsibility (TPSR), Teaching Games for Understanding (TGfU), and Teamball (a Danish model inspired by TGfU and aspects of SE). See Table 1 for detailed information about the teaching and learning experience, including allocation of time and focus (e.g. model) for each teacher educator.

Data collection

Data generation included two primary sources: audio records of our meetings in different configurations (21 meetings and approximately 35 hours audio) and our reflective diaries (total of 10 entries and 20 pages). Eight meetings were carried out by the four group members in Norway. There were no set times to meet, however, these were typically conducted once every 2–3 weeks. The other configurations were three pair meetings conducted after peer observations (e.g. Mats meeting with Lasse, Berit meeting with Anders); four group meetings with Tim, and six individual critical friend meetings with Tim. Meetings with Tim were conducted using Skype. All meetings were audio recorded and transcribed verbatim. Reflective diaries from Berit, Anders, Lasse, and Mats were written following every second or third lesson using a predefined template. The template included prompts to document what worked/did not work in planning and implementing MBP, challenges and feelings

Table 1. Detail on the module teaching and learning experience.

Module: 'Curriculum and Teaching'.
Purpose of module: In the module, pre-service teachers are learning about the pedagogical process that goes from interpreting the curriculum to planning, executing, and evaluating teaching and learning.
Assessment: In pairs or groups of three, over 10 weeks pre-service teachers were to develop a compressive lesson plan (i.e. context, perspective/pedagogical model, curriculum goals, lesson goals, and what, how and why of pupil learning experiences), and justify and reflect on pedagogical decisions. Requirement of two supervision meetings with one of the teacher educators.

Teacher	Content & number	Teaching and learning experience
Lasse	Seven Teamball lessons of 105 minutes (sports hall)	• Learning about Teamball theory and principles. • Experiencing Teamball as learners. • Group and individual reflection/discussion.
Anders	Six TGfU lessons of 105 minutes (sports hall)	• Learning about TGfU theory and principles. • Experiencing TGfU as learners. • Group and individual reflection/discussion.
Mats	Six TPSR lessons of 105 minutes (sports hall)	• Learning about TPSR theory and principles. • Experiencing TPSR as learners. • Pre-service teachers reading, planning, and peer teaching using TPSR principles. • Group and individual reflection/discussion.
Berit	Four lessons of 105 minutes (classroom)	• Aiming to connect the three models to the Norwegian PE curriculum and wider pedagogical literature. Lecture combined with pair/group tasks and reflection.
Lasse, Anders, Mats, Berit	Seven lessons between 180 and 300 minutes on multiple pedagogical topics (e.g. planning, legitimisation of physical education)	• Short presentation of a pedagogical topic, group work, presentation of group work and discussion.
Others	Three classroom lessons on 'lesson planning' (Leo) and two classroom lessons on 'classroom management' (Mason)	• Lecture combined with pair/group tasks and reflection.

of vulnerability and how we overcame or at least acknowledged such experiences, our impression about the model we were teaching at the time and how it influenced our practice, and the identification and description of a critical incident. Reflections were sent to Tim for his response (e.g. probing questions asking for more detail about a situation, asking reasons for pedagogical decisions, etc.). On several occasions following the sharing of reflective diaries there was an individual critical friend meeting. In addition, we wrote individual summative reflections on the process in response to the initial research questions. Reflective diaries often form the bulk of data used in many self-study inquiries, however, it represented a smaller portion of the data in our study for one main reason: Berit, Anders, Lasse, and Mats all used Norwegian as their first language while Tim only spoke English. While all authors could communicate in English, we felt that it was overly onerous to ask the four Norwegian authors to write frequently in something other than their first language and for that to be shared with Tim as part of the critical friendship. Speaking (rather than writing) in English was easier for all participants, which is one reason why the audio recordings form a larger portion of the data in our inquiry. As Vanassche and Kelchtermans (2015) explain in their review on the state of the art in self-study methodology, there is no one preferred method of collecting self-study data, with researchers relying instead on methods that are feasible and will provide the needed evidence in order to understand their practice (Hamilton and Pinnegar 1998).

This critical friendship process is similar to that described by Fletcher, Ní Chróinín, and O'Sullivan (2016), where two teacher educators interacted with each other as critical friends while also involving another more experienced teacher educator to provide arm's length commentary and recommendations based on a high level of expertise in the area being studied. While Tim's role was also

to provide similar arm's length commentary, he saw his role less as providing expertise but more as facilitating the S-STEP process given his previous involvement with other critical friendships.

Analysis

With an aim to produce understandings of the self-in-practice as they emerged in our experiencing of that practice (Ovens and Fletcher 2014; Pinnegar and Hamilton 2009), we engaged in a dialogic process of 'thinking with' the concepts from developing a pedagogy of teacher education (Jackson and Mazzei 2012; Loughran 2006; Pinnegar and Hamilton 2009). As such, our analysis was not grounded in conventional coding but rather in a process of using the data together with Loughrańs concepts to making and unmaking sense of our individual and collective self/selves-in-practice (Jackson and Mazzei 2012). This involved processes of agreement and disagreement, mediation and expansion, commonality and difference (Pinnegar and Hamilton 2009), as well as engagement with the data, literature on the pedagogy of teacher education and other relevant research literature, and with each other. There were five specific steps in the analytic process. First, those of us in Norway (Tim was not involved due to most of the data being generated in Norwegian) engaged with the data and the concepts of teaching about teaching, learning about learning, and learning about teaching while interacting with our past and present understandings, practice, contexts, and conditions along with projection into future practices and contexts (Pinnegar and Hamilton 2009). Our focus in this process was to identify critical incidents that might raise 'broad, sustained issues', and serve to focus our thinking 'in ways that lead to insights about teacher education practice' (Fletcher et al. 2018, 80). In this process, we highlighted multiple incidents where our collaborative approach resulted in encouraging and problematising the complexities of teacher education practice. Second, we met as a group when Tim visited Norway where we continued the analytic process based on the first step. Acknowledging the role of critical friends in S-STEP data analysis, Tim challenged us to interrogate, explore, and consolidate ideas expressed while facilitating the process of negotiating the contradictions and tensions produced by our dialogue (Pinnegar and Hamilton 2009). Tim's engagement allowed the entire group to develop a clearer understanding of how both the individual and collective self/selves-in-practice were functioning in our collaboration. In this process we developed the main themes (i.e. affordances, complexity, needs and concerns) that were to function as a basis for the understanding and ideas shared in this paper. Third, in dialogue with Tim, Mats further developed the main ideas as he went back to the data while 'thinking with' the concepts of a pedagogy of teacher education and further connecting it with the literature on MBP and wider literature on teacher education. Fourth, Anders and Mats connected data extracts to the ideas that would later support the main results. Lastly, Tim, and Mats engaged in a process similar to 'memo writing' (Charmaz 2006) where we developed the understanding that was later to be included in the final results section.

In addressing trustworthiness we sought to make clear and detailed descriptions of data sources and data generation methods, consider multiple ways to represent the data in the self-study (including alternative points of view), and provide evidence about the ways the self-study has led to changes in ways of being a teacher educator (Feldman 2003). With that said, we also noted Craig's (2009) suggestion that trustworthiness in self-study research relies on members of the teacher education research community to make judgements about trustworthiness based on their experiences relative to their own professional contexts.

Results

The analytic process of 'thinking with' the concepts of a pedagogy of teacher education (teaching about teaching; learning about learning; learning about teaching) and reflecting on our experiences and processes enabled us to produce two main themes that help explain how we negotiated the collaboration in the module. Specifically, we identify the affordances and complexities of a collaborative

approach to teaching about teaching using MBP, as well as the ways we needed to consider and respond to the needs of both pre-service teachers and teacher educators as part of the collaboration.

The affordances and complexities of a collaborative approach to teaching about teaching MBP

Several teacher educators have explained how challenging it can be to implement MBP in PETE, particularly when working in isolation, having few reference points if MBP is an innovative practice to the teacher educator, or if they are struggling to adapt MBP from the school context to pre-service teacher education (Baker and Fletcher 2017; Deenihan, McPhail, and Young 2011; Fletcher and Casey 2014; Hordvik, MacPhail, and Ronglan 2017; 2020). Our results show that the collaborative approach to teaching about teaching MBP facilitated implementation individually and collectively. Importantly, our results provide evidence to move beyond speculation. There were several processes and structures of our collaborative approach that supported implementation, including: a group decision to frame and focus the PETE module around MBP, conducting regular group meetings, conducting peer observations of one another's teaching, and engaging with an external critical friend. The promise and development of a shared technical culture (Lortie 1975) was something we all found generative in both the process and the outcomes of the research. As someone who previously engaged in MBP implementation on his own, Mats compared his experience of the collaborative approach to his previous experience of implementation, which he carried out alone:

> Working with Lasse, Berit, and Anders 'on the floor' and, at the same time having Tim on the team, provided an extreme motivation and meaning to the work/practice. While in my doctoral degree I felt that colleagues almost opposed me and thus made me unsure of my approach, I have now felt the opposite. I have been challenged on meaningful moments, received support and felt that I am part of a professional community. It has contributed to good reflections on [and in] teaching and learning, while at the same time provided security towards my teaching and my role as a teacher educator … Without being able to say this for sure, I also think the pre-service teachers were influenced by the fact that it was a team that worked on this and not just a 'lone wolf'. This made it easier to 'sell' MBP and engage pre-service teachers in meaningful learning experiences. (Mats, reflective diary)

While it is important to acknowledge the positive aspects of the collaborative approach such as those described by Mats, it also resulted in increasing the complexity of MBP implementation, both for ourselves and pre-service teachers. This is not to suggest the complexity was overly problematic but that it needed to be closely managed. For example, several of the models were new to us: while Lasse was familiar with Teamball, he, Anders and Mats were new to TGfU and TPSR. Further, all of us were mostly unfamiliar with implementation of *multiple* models. Not only did this mean we had to spend time learning about the new models, planning implementation and assessment, it was often difficult to find times when pairs or the group could meet to discuss the collaborative approach to teaching MBP and to share how the individual approaches within the collaborative approach would 'fit' and be presented in a coherent way to pre-service teachers. We experienced this as difficult within our respective hectic personal and working lives. For example, the data show how we were coming late to group meetings and/or had to go early to another meeting or teaching. Berit shared her experience of the challenges of managing competing demands: 'We have to plan the teaching, do the teaching, observation and reflections … , when we meet in our research-project, I often have to run because its 15 minutes to the next lesson and so on' (Group meeting). Moreover, there were implicit power dynamics in our collaboration, particularly given the wide range of years of experience teaching in the PETE programme, different research and teaching loads held by each member of the group, and Mats' role as the main facilitator of the group despite his being the most junior member of the programme. While the power dynamics in the group did not overly impede the process, they had implications for how the group functioned, how relationships developed and were maintained (e.g. how trust was formed and held), and how our individual and collective practices were framed, discussed, and critiqued (Cuenca and Rogers 2019; Richards and Shiver 2020). For interested

readers, we attend more to the issues of power dynamics and the group processes in Hordvik, Fletcher, Haugen, Møller, Engebretsen (forthcoming).

As some teachers (Casey and MacPhail 2018) and teacher educators (Fletcher and Casey 2014; Hordvik, MacPhail, and Ronglan 2017) have shown previously, we support claims that teaching about teaching pedagogical models and/or MBP takes time and that there is a need for perseverance. However, at the same time, the collaborative approach facilitated perseverance at the individual and group level by making us in many ways accountable to one another, to engage in collaborative processes, and to make time to discuss our MBP approach and the teaching of individual models so that pre-service teachers were encountering coherence in their experiences of learning to teach. In our last group meeting, Anders and Berit (respectively) shared how the collaborative approach facilitated perseverance:

> Anders: I think that [working as a team] is an important part of [the affordances of the collaborative approach] … I really think that when we are doing this module next year we are definitely going to benefit from the experiences we have had now; […] the feeling of working together and how that is meaningful, and also how that is reassuring for your own practice. When we are working with new people in the department [in the future], I think we will benefit from applying some of the same stuff, especially the meetings where we discussed our teaching.
>
> Berit: After many years as a teacher educator, it was great to feel the support of a team and motivating to know that we shared a common professional platform with common goals. I think it is important to cooperate when you try innovative pedagogies because it allows you to have someone to discuss the professional practice with. Alone it is very easy to get confused and unsure about your practice.

Along with perseverance came a high level of complexity in how we managed group dynamics in relation to teaching and learning, and also in the research process. The complexity of the collaborative approach was highlighted in the following scenario. As a group we decided to teach three models in the PETE module, as we felt this would illustrate nuances in each model and different outcomes that each model possessed. This involved a discussion about our reasons to choose three models (and not two or one or four) and which three we would choose based on the potential outcomes. We agreed to emphasise our modeling of teaching the model (including introducing core aspects of the model theoretically in practical sports hall lessons) as we felt this would facilitate pre-service teachers discussing and reflecting on their learning experience. However, we quickly realised that this provided pre-service teachers with a superficial experience of each model and prevented deep engagement. For example, the group meeting data show how our discussion led to realising that pre-service teachers would have only six lessons to learn about each model (both learning about learning in the model and learning about teaching with the model), which would require prioritising aspects of the model to emphasise in our teaching, and articulating both how and why to teach the model and its components. The complexity inherent in each model led to some disappointment with the lack of deep understanding of any one model that could be achieved. This was not our intent and Lasse reflected on this in a Skype meeting with Tim.

> Lasse: I have only 5–6 lessons and we have three different models. I felt [the complexity], and the pre-service teachers had difficulty to see the difference between models … [It] will be interesting when we finish the project and hear what the pre-service teachers think about it. My feeling is that it´s not enough lessons for each model and that [there] is some confusion about the different models. I would have wanted more lessons and I think Anders and Mats feel the same. I had wanted to go more in depth into the model.

While we experienced this complexity in our teaching about teaching MBP and sensed confusion in pre-service teachers' experiences of learning about teaching MBP, we did not consider changing our approach during the module as we believed this would further increase pre-service teachers' sense of confusion. After finishing the module and in our final face-to-face group meeting, we discussed how to improve and change the teaching and learning experiences the next year as a way to reduce confusion and increase the module coherence and the extent to which any deep understanding of one or more models could be achieved in one module:

Mats: If I think back to the focus groups, it might be too complex with three models … ,should we drop one model, and rather spend more time on two models and pre-service teacher supervision? If we decide to go for two models, should we teach two models that are different, such as TGfU and TPSR, allowing pre-service teachers to experience the differences? Or TPSR and Teamball because they are further away from how pre-service teachers believe physical education should be taught?

Lasse: I like the idea that pre-service teachers experience the differences; that is best as a starting point in their first year … Module 2 focuses on 'Bildung', so it fits well with the two models, and then (pre-service teachers can learn about) TGfU in module 6 or 7 …

Mats: To summarise: go down to two models, allowing us to increase the amount of practical lessons and time for supervision.

Lasse: Yes, and lectures, we had about 9–10 in total. Were there too many, should we reduce? The students said that they liked the seminars [rather than the lectures].

Considering and responding to the needs and concerns of pre-service teachers and teacher educators

Despite the complexity of implementation of MBP at a group level, the collaborative approach resulted in a dynamic, recursive development of individual and collective pedagogies of teacher education. Specifically, this involved us considering and responding to our needs and concerns on personal and group levels, as well as to those of pre-service teachers. This was facilitated through reflections on our teaching practices (as individuals and as a group), our paired and group discussions, observing one another's teaching, and teaching together.

Throughout the module, we also sought to provide opportunities for pre-service teachers to respond to and share their experience of our teaching and their learning. This served several purposes in terms of research and pedagogy. Specifically, we ran focus groups with pre-service teachers, where questions were posed about our implementation and pre-service teachers' experiences of MBP. Not only did this generate research data (that we report on in subsequent manuscripts), it also featured as part of our modelling of teaching the models and of modelling the actions of 'good' teachers. For example, Mats used the individual reflection stage of a TPSR lesson to get feedback on pre-service teachers' experiences, and the process also encouraged pre-service teachers to reflect on their learning after lessons. It also provided opportunities for meaningful and thorough interactions between teacher educator and pre-service teachers in lessons. We felt that this led to a greater sense of trust, in that pre-service teachers felt they were being listened to and that their opinions mattered and were taken seriously in the development and progression of the module. Berit commented on this in a group meeting:

> I found it very helpful to interview the pre-service teachers along the [teaching and learning] process. Experiencing students' reflections of our teaching, how it influenced them, and what thoughts and opinions they developed; it was very useful for my teaching. So for me, the focus groups were important for understanding the pre-service teachers (personally), their educational starting point, and what they along the process felt they needed to learn in order to facilitate what they thought of as effective physical education teaching and learning.

From these examples, it is evident that we used the concepts of a pedagogy of teacher education in a cyclical way. That is, our experience and concerns of teaching about teaching MBP interacted with and were informed by pre-service teachers' experiences of learning to teach and learning to learn. Our understanding of the pre-service teachers' experiences were then fed back in to our own experiences and practices (both individually and as a group) of teaching about teaching. In his final reflection, Mats reflected on this relationship:

> In my teaching, I believe there has been an interesting connection between what, how, and why, of which the three clearly have influenced each other. TPSR has been there as a guide for the content [i.e. the what] and how to teach the content through my modelling of teaching TPSR. At the same time, I changed the way I taught based on reflections on why I teach as I do: e.g. I went from modelling of TPSR to pre-service teachers working more with TPSR. This was done based on my own observations and reflections [of my own and the others'

teaching and pre-service teachers learning], discussions with Tim and feedback from the pre-service teachers. I find this interaction between what, how, and why as interesting and how S-STEP [i.e. the collaborative approach] contributes to concrete and meaningful reflections on these relationships.

Interestingly, this interrelated and dynamic relationship between ourselves and pre-service teachers led to deeper individual reflections on our teaching about teaching and it became clear that, as a group, we had developed a shared language and vision for: teaching in school physical education, teaching about teaching MBP, and the continuous development of our personal and collective pedagogies of teacher education. Through individual reflections and group discussions, we agreed that this involved: (i) modelling teaching of our single models, (ii) requiring pre-service teachers to not only experience the model as learners but to reflect, discuss and/or work with each model's features, (iii) connecting university course work to pre-service teachers' school placements, and (iv) connecting classroom lessons with practical lessons. This shared vision led to coherence in how we talked and taught about MBP with each other and with pre-service teachers. For example, the group meetings show how we used phrases such as 'teaching about the what, how, and why', 'modeling teaching of the model versus pre-service teachers working with the model', 'switching between the teacher and student perspective'. These visions helped make our individual and collective practices and their articulation coherent to ourselves and to one another, and also to the pre-service teachers whom we taught. Furthermore, by adjusting our teaching with respect to pre-service teachers' needs and concerns for their learning, we were modelling what we felt were important actions and dispositions of reflective practitioners, which then led to a deeper engagement with pre-service teachers' experiences of learning to teach (in contrast to experiences where pre-service teachers might have been 'only' learning about MBP).

Discussion

Our purpose in this study was to develop an understanding of how a collaborative approach to teaching pre-service teachers MBP can support coherence in PETE modules. To our knowledge, this study is the first to provide a group of teacher educators' voices about their experiences of implementing MBP in a PETE programme. As well as offering some clear guidelines for readers to implement MBP in their own contexts, we believe that the results of this study contribute to the wider knowledge base of PETE research. That is, while the study starting point and research question focused on MBP, we believe that the understanding developed from this study not only can be taken up by MBP scholars but many who working in PETE and in teacher education more broadly. Specifically, this study highlights the affordances of taking a collaborative approach to teaching about teaching (particularly when teaching about pedagogical innovations) and how the collaborative approach produced coherence in our teaching at the individual and collective level. In the following, we first discuss the nature of our MBP approach before elaborating on our developing multi-layered vision which further produced coherence in our practice.

While researchers have asked for more research of teachers using multiple models (that is, models-based practice and not model-based practice) (Casey 2014; Casey and MacPhail 2018), this study shows that MBP in PETE can look different from school physical education. In this study, four of us taught one model each which together formed an MBP approach in one PETE module. As such, our individual model-based approach formed a collective models-based approach. Importantly, while it could have been possible for one of us to teach all three models, we decided as a group that we would each teach one model and collaborate on implementing a models-based approach throughout the module. While the collaborative approach increased the complexity of teaching about teaching MBP, it also produced a supportive context for each of us to implement MBP in our individual and group teaching. This type of supportive context stood in contrast to what Mats had previously experienced implementing MBP on his own (Hordvik et al. 2020), and highlights the affordances of taking a collaborative approach to implementing MBP. Furthermore,

while an external critical friend (Hordvik et al, 2017) or collaborating researcher from another university (Fletcher and Casey 2014) may provide support to individual teacher educators, our research shows how a programmatic group approach to teaching about teaching MBP may have greater influence on teacher educators' confidence and perseverance to implement innovative practices in PETE. It may also be interpreted by pre-service teachers as representing a coherent approach within the module and programme more broadly. This is not to say we did not experience similar challenges and tensions as others who have tried to articulate the what, how, and why of teaching MBP (e.g. Fletcher and Casey 2014; Hordvik et al., 2017). For example, we were constantly struggling with decisions about how and when to encourage pre-service teachers to discuss their experiences of the models, maintaining a commitment to focus on our own learning about the model we were teaching, and ensuring that pre-service teachers were reading about the models before classes. However, guided by S-STEP methodology, our results highlight how our collaborative approach to teaching about teaching encouraged us to continuously, and in a cyclical way, consider the interrelated concepts of a pedagogy of teacher education (i.e. teaching about teaching, learning about teaching, and learning about learning) (Loughran 2006). We did this by continuously reflecting on and discussing the myriad aspects inherent in our individual and collective pedagogies of teacher education. That is, the context, pre-service teachers' needs, interests and motivation, planning and selection of content, and other challenges pre-service teachers face with MBP (Loughran 2006; 2013). These collaborative processes, that were facilitated by the use of S-STEPas methodology and pedagogy, allowed us to negotiate some of the challenges and tensions we experienced in our individual and collaborative practices and to make clear for us what we aimed for our individual and group teaching. Consequently, we were not only considering pre-service teachers' needs and concerns for their learning but also our needs and concerns for our teaching and learning. From this cyclical consideration of, and negotiations between, the interrelated aspects of teacher education pedagogy, we developed a shared vision and coherence in our practice.

There is a need for a common vision and greater coherence within teacher education programmes (Klette and Hammerness 2016). This research demonstrates how the processes and structures of our collaborative approach to both implementing MBP and S-STEP methodology supported our attempts to achieve coherence individually and collectively in our department. We did this by: (i) deciding as a group to frame and focus the PETE module around MBP, (ii) carrying out regular group meetings, (iii) conducting peer observation of each other's teaching, and (iv) connecting with an external critical friend. Facilitated by S-STEP, this helped make our practices (both individual and collective) and their articulation coherent to ourselves and each other, and to the pre-service teachers whom we taught. We argue that our vision was multi-layered and interconnected, resulting in the development of a coherent approach to PETE. First, we developed a shared vision that MBP represents an effective approach for teachers in school (related to how and what teachers should teach in school). This vision was mainly developed during the planning phase and represents individual and collective beliefs amongst our group that MBP represents a meaningful teaching and learning approach for physical education. Similar to Ní Chróinín et al. (2019), who used the principles of meaningful physical education as a guiding vision for their teaching and teacher education practice, the principles of MBP and the multiple models we used informed the ways we were modelling teaching of the models, and provided a focus for our own and our pre-service teachers' inquiries into physical education teaching practice. Second, while MBP informed our modeling of the pedagogical models and our focus on what and how we taught, and why we taught as we did, we also developed a shared language and vision for our teacher education pedagogy. That is, a vision for teaching pre-service teachers about teaching MBP in schools. Because teacher education practice differs from the practices of school teachers (Loughran 2006), it seems important to develop and articulate a vision for not only good physical education practice but also good teacher education practice – that is, a pedagogy of teacher education (Loughran 2006). Our vision for our practice as teacher educators involved a desire to teach about, and for the pre-service teachers to learn about, the what, how, and why of teaching MBP. Third, coherence could be sustained through

the ongoing development of our pedagogies of teacher education. We believe such coherence would necessitate: (i) inquiry/improvement-oriented stance towards practice, (ii) collaborative stance towards individual and group planning and practice, (iii) sharing and negotiating our challenges and success, needs and concerns, and (iv) exploring and considering pre-service teachers' needs and concerns. Not only would this lead to coherence in how we engaged with each other as teacher educators it would also model ways to engage in reflective practice for the pre-service teachers we teach. This aspect of developing coherence is closely connected to our S-STEP approach and display how S-STEP can function as methodology for teacher educator professional development but also as pedagogy for teaching about teaching. In this way, our research has implications for and perhaps offers some clarity around debates about whether S-STEP is methodology or a pedagogy. Based on evidence from our research, we take the position that it can comfortably serve as both simultaneously. We explore this position further in Hordvik et al. (forthcoming).

Conclusion and implications

In this research, we have highlighted the potential for collaborative approaches to teacher education practice. Specifically, our inquiry-based and collaborative approach facilitated the development of a shared vision and coherence in teaching pre-service teachers about teaching MBP. Subsequently, we argue that if MBP or other innovative approaches to teaching and teacher education are to be taken up by pre-service teachers, there is perhaps greater likelihood they will do so when it is presented in a coherent way. This can be achieved when MBP is taught by several teacher educators and across several modules within a department. Coherence (alignment between vision and actual teaching) has been identified as a central pillar of powerful teacher education programmes (Darling-Hammond 2006; Klette and Hammerness 2016), and so it follows that this principle should also apply when thinking about MBP. Our understanding is that the development of coherent programmes and modules requires at least: (i) good leadership and organisation, (ii) a professional and committed group of teacher educators who are willing to share their understanding, challenges, and uncertainties with one another and with pre-service teachers, (iii) an inquiry-oriented stance towards researching group and departmental beliefs and practices, and (iv) a desire to better understand and share the development of new understandings with colleagues at departmental, national, and/or international levels.

Our research adds to the S-STEP literature, particularly in the ways that S-STEP can be used by groups of teacher educators as methodology and pedagogy to deepen understandings of both individual and collective teacher education practices. Many collaborative S-STEP inquiries have involved pairs of teacher educators acting as critical friends to each other, or small groups inquiring into teacher education practice in a broad, general sense. We argue that S-STEP carries potential to facilitate pedagogical innovations in teacher education programmes when it is conceptualised as both methodology and pedagogy, supporting both a research agenda and professional development agenda for teacher educators.

We acknowledge that we represent a small group within a larger department and that we were teaching in one module and not across the entire PETE programme. Moreover, the number and types of models used raises questions about the depth in which PETE students will learn about and engage with each model. For this reason, we encourage departments or larger groups responsible for delivering teaching in a PETE programme to research their implementation of innovative approaches such as MBP. Furthermore, we encourage teacher education researchers to articulate the development of their own individual and/or collective pedagogies of teacher education, to provide further understating of how shared language and vision can guide the development of coherent teacher education programmes, teacher educator professional learning, and pre-service teachers' learning.

Disclosure statement

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