Original Article

Learning Climate in Physical Education

Analysis of pre-service teachers' reflections about, and facilitation of, learning climate in their own teaching

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Abstract

Problem statement:

- 1) Which elements do Pre-service teachers highlight as significant for facilitating learning climate in Physical Education classes?
- 2) To what extent are these elements evident in their teaching?

Approach: 15 pre-service teachers, in their 4th semester participated. Data collection was linked to the students' planning and implementation of a three-week internship, and consisted of both focus group interviews and video of their teaching sessions. *Purpose:* The purpose of this study was to analyse pre-service teachers' reflections about, and facilitation of, learning climate in their own teaching. *Results:* The main findings show that pre-service teachers are particularly concerned with emotional support, but rather less focused on learning outcomes. Their statements and teaching sessions indicate that intentional teaching is superfluous. *Conclusion:* This study reveals a need for a greater focus on learning climate in the PETE-program. First, it is important that PST develop a common understanding of the concept of learning climate that corresponds with the current literature. In addition, PE Teacher Program have to enhance PST' opportunities to practice and reflect upon their own teaching.

Keywords: Teacher education, Learning outcome, Emotional support, Movement culture

Introduction

A growing body of research indicates that learning climate is a critical dimension of teaching and learning (Cohen, 2001; Hattie, 2009; Nordenbo, Larsen, Tiftikci, Eline Wendt, & Østergaard, 2008; Wang, Haertel, & Walberg, 1993). Based on these studies, it may be concluded that learning climate not only promotes health, well-being and positive social development, but also has a significant positive effect on pupils' learning outcomes.

Research on learning climate in Physical Education (PE) has primarily been based on a social cognitive framework (Ntoumanis & Biddle, 1999), and has been related to pupils' perceptions of the learning climate. Ommundsen and Kvalø's (2007) findings, show that a mastery climate, autonomy support, perceived competence and intrinsically regulated motivation predict enhanced levels of interest and enjoyment of PE, while Halvari, Skjesol, and Bagøien (2011) demonstrated that teachers that arrange a mastery climate may have a substantial effect on pupils' motivational processes and behaviour in PE.

According to Crum (2012) the physical educators community does not give priority to the proposition that a physical educator's primary function is to help pupils learn. He reference to Locke (1987) who notes that many physical educators are not really committed to teaching as the essential and central element of their profession. The task is just to organize in good order and atmosphere, or keep the pupils in good shape by physical exercise. This is also confirmed by recent Norwegian research (Moen, 2011). The study identify a number of challenges for Physical Education Teacher Education (PETE) program in Norway. The challenges cover a variety of areas, including a concern over persistent content-focused pedagogy prioritizing skills and technique-based instruction before learner-centred pedagogy. Research (Crum, 2012; Moen, 2011) thus show a rather mixed and random PE teaching in school. In order to change this practice, it will be important to gain insight into how future PE teachers reflect on such an important concept as learning climate. For this reason, this study was aimed at PST who chose a specialization in PE, at a Norwegian university. The main focus was on their reflections and work associated with learning climate. Tsangaridou and Polemitou (2015) point out that PST are able to develop and demonstrate different dimensions of reflection during their teaching. Even when teachers use the same curriculum and apply the same concepts (e.g., learning climate), they bring different perspectives and meanings. The purpose of this study was to determine the extent to which PST in a typical Norwegian PETE-program (primary and secondary school) understood key goals of teaching, regarding the facilitation of a learning climate and the pedagogies by which these could be achieved. In addition, the purpose was to see to what extent these pedagogies were implemented by the PST.

Learning climate

Many terms are used to describe the “learning climate” in schools, such as learning environments (Fraser, 1998; Moos, 1979; Wolf & Fraser, 2008; Wubbels & Brekelmans, 2005), school climate (Cohen, McCabe, Michelli, & Pickeral, 2009; Collie, Shapka, & Perry, 2012; Loukas & Murphy, 2007), classroom climate (Ambrose, Bridges, DiPietro, Lovett, & Norman, 2010; Gillen, Wright, & Spink, 2011; Johnson & Johnson, 2002) and motivational climate (Ames, 1992; Fraser & Walberg, 2005; Pintrich & Maehr, 2004). The majority of research on learning climate attempts to identify learning characteristics that pupils perceive as important for learning outcomes and well-being (Deci & Ryan, 1985; Ntoumanis & Standage, 2009; Standage, Gillison, & Treasure, 2007). According to self-determination theory (Deci & Ryan, 1985), it is essential for a teacher to satisfy pupils’ basic needs for belonging, autonomy and competence (Vallerand, 1997). Achievement Goal Theory (Ames 1992) distinguished between mastery- and performance-oriented climates. The Norwegian PETE-program emphasizes that the goal of action is to develop task mastery, task improvement, or task learning, and where the demonstration of competence is self-referenced.

The processes underlying facilitation of the teaching-learning relationship is complex (Todd, Begona, & Carol, 2016). Rimm-Kaufmann, Baroody, Larsen, Curby and Abry (2015) point out that positive relationships between a teacher and a pupil depend on a positive, committed teacher showing respect, providing support and challenging pupils’ reflections on their own learning. This includes both academic and emotional support, where the teacher challenges the pupils’ learning processes based on the pupils’ individual requirements. For this reason, this study employs the following definition of the term “learning climate”:

A learning situation where, in response to pupils’ individual needs and requirements, the teacher provides academic and emotional support that stimulates the pupils’ learning outcomes and experience of participation and belonging in a positive classroom community.

The difference between novice and expert teachers

Hattie (2003) identified five major dimensions of excellent teachers, one of which was related to classroom interactions: guiding learning through classroom interaction. He highlights three areas where this manifests itself: proficiency in creating an optimal classroom climate for learning, a multidimensional complex perception of classroom situations, and being context-dependent with high-level situation cognition.

Expert teachers draw upon a wide range of knowledge in planning classes, including knowledge of the pupils, both as a group and as individuals, the curriculum, classroom organization, pupil learning and the subject matter. Their planning is detailed, and it includes pupil actions, not just teacher actions (Tsui, 2003). Expert teachers, in part, tend to represent problems using deep structural features, whereas novices primarily rely on surface features (Hogan, Rabinowitz, & Craven III, 2003). In a study by Housner and Griffey (1985), experienced teachers of PE needed more specific information than novice teachers did before being able to plan lessons in either soccer or basketball. Information included the availability of equipment, pupils’ abilities, and the type of facility and prior knowledge of the pupils. This is confirmed by Hyndman (2014) which addresses a gap in the literature by exploring the differences in teaching perspectives between Australian pre-service and graduate physical education teachers.

In describing the perceptual-cognitive features of expertise, Klein and Hoffman (1993) stated “novices see only what is there, while experts can see what is not there”. Findings suggest there is a significant relationship between teaching experience and the ability to perceive and describe interactions and events in the classroom accurately (Hogan et al., 2003). Thus, novices may perceive classroom events in terms of the actions of a teacher, whereas experts realize the importance of observing both pupil and teacher actions to represent classroom dynamics.

Purpose

This study aimed to clarify what PST associated with the term learning climate, and how this was present in their teaching sessions. A basic assumption of the study was that learning climate is so fundamental in the teaching profession that reflection and conceptualization should be practised by PST in their second year of teacher education. Findings from research on classroom teachers (Tsangaridou & Polemitou, 2015), indicated that the PST were generally able to reflect at a technical and practical level but there were only a few examples of critical reflection. On this basis the following research questions were developed:

- 1) *Which elements do PST highlight as significant for facilitating learning climate in PE classes?*
- 2) *To what extent are these elements evident in their teaching?*

Material and methods

This study was part of a major multidisciplinary project, Teachers as Students (TasS), which focused on teacher training (Munthe, Bjuland, & Helgevold, 2016). The TasS- project was supported by the Norwegian Research Council (project no 212276) and has been approved by the Ethical Board, Norway.

Participants

The Norwegian teacher training program runs over four years. In fourth and fifth semester PST choose a specialization, a total of 60 credits. Students in this study chose physical education as their specialty. The

teaching at campus emphasized work related to elements that affected learning climate in physical education. The PST went through a three-week internship in the fourth semester, and data collection was linked to the planning and implementation of this. During the internship they were divided into groups of 3 or 4 persons.

Four groups consisting of a total of 15 PST took part in the study. The participants was self-selected and they were assured of confidentiality and informed of their right to withdraw from the study whenever they wanted. Each group took part in two Focus Group Interviews (FGI), one before and one after the 3-weeks internship (total = 8 FGI). In addition, we made video recordings of two PE teaching sessions for each group, a total of 8 films.

Focus Group Interviews

The FGIs were held on campus, a location familiar to the participants, and were moderated by two researchers. The FGI protocol was semi structured. Each interview consisted of four parts and lasted about 1.5 hours. Part 1 consisted of questions related to why the PST had chosen the teacher training program, previous teaching experience, and why they had chosen specialization in physical education. Part 2 focused on teaching practice in general. In the third part, the PST were presented with a case where a sixth grade teacher asked for advice on how she could enhance learning opportunities for all pupils. In the last part, the PST were invited to discuss didactic reflections related to physical education teaching. The interview guide was developed in the research group and contained 4-7 main questions for each section, as well as proposals for follow-up questions if necessary. All scholars who participated in the project underwent a common training component for quality assurance of procedures. Recordings from the interviews were transcribed, and these transcriptions form the basis of our analyses.

Recording of teaching sessions

The teaching sessions were recorded on location at the schools where the PST conducted the internship. We used two camera with built-in microphone, plus an additional microphone placed on the PST teaching the lesson. The stationary cameras were placed so that they captured most of the activity going on in the lesson. In addition, we followed the PST teaching the lesson with a handheld camera throughout the session. The lessons lasted on average 50 minutes. Main strength of this study was access to both interviews and actual practices. These allowed us to analyze how PST maintained learning climate in their own teaching and whether there was concurrence between what PST said and what they did.

Analysis

FGI

To analyse the data from FGI, we used conventional content analysis (Hsieh & Shannon, 2005). The categories emerged through an inductive approach. Based on the interview, statements were systematized and placed in three main categories, that comply with what the research literature cites as important for learning climate (Cornelius-White, 2007; Roorda, Koomen, Split, & Oort, 2011; Hattie, 2009; Hagger and Chatziantis, 2007); 1) Teacher engagement, 2) pupils' impact on the learning climate, and 3) the atmosphere in the teaching situation. Several researchers collaborated in the transcriptions and interpretations for analyses.

To uncover how teacher education develops PST' understanding of and reflections on the concept of "learning climate", we analysed their statements in light of the Dreyfus Model of Skill Acquisition (Dreyfus, Dreyfus, & Zadeh, 1987). Using this model, this study describes and interprets the extent to which the present teacher education programme develops PST' reflections on learning climate. The statements were analysed in relation to the model's five stages from beginner(1) to expert(5). Because the PST participating in this study were in their second year, it was important to clarify whether their teacher education so far had increased their level of reflection, enabling them to reflect beyond a novice level and move towards expert level. As an example, the quote below shows a typical transcript in which the participant highlight key factors in the learning climate:

Yes, I think in a way it really depends on how comfortable they are, and if they dare to let loose in a way, because there does not have to be a definitive answer to what the dance should look like; they can just jump around, if only they dare to do it.

The statement highlighted some key elements (*comfortable/dare to let loose*) related to emotional support, but did not draw attention to the interaction between teacher and pupil and among pupils. Demands for professionalism were absent in this statement (*they can just jump around*). The participants did not refer to course literature or to their own teaching experience. This indicated that the participant still was at the beginner/novice stage, and thus classified at level 1 in terms of the Dreyfus model.

Video

Video analysis of lessons sessions were conducted by two researchers. We used the Classroom Assessment Scoring System (CLASS)-manual (Pianta, Hamre, & Mintz, 2012) to assess the classroom quality. CLASS is a standardized and validated method for identifying key factors, concerned with learning climate, in teachers lessons practice (Munthe, 2005). Interactions between teachers and pupils are grouped into three domains: Emotional Support, Classroom Organization, and Instructional Support. Each of these domains is measured by several more specific dimensions of teacher-pupil interactions. Each scale use a seven-point Likert-type format (1-2: low-range, 3-5: mid-range, and 6-7: high range). The score sheet has space next to each

dimension for the observer to jot down notes to help assign a final rating at the end of the observation cycle. Two researchers watched the video together, but coded independently. The sessions were divided into 20-minutes chunks and they scored after each part. Then they compared their coding, and if there were discrepancies, they discussed, and finally a common score for the entire lesson were developed.

Results and discussion

Which elements do PST highlight as significant for facilitating learning climate in PE classes?

Table I. Pre-service teachers' statements

Statement (Number of times)	Category
The teacher have to: <ul style="list-style-type: none"> • be energetic in work (2) • active (7) • present challenging tasks (3) • communicate in a positive manner (2) • present motivating tasks (9) • motivate both gender (3) • show pleasure (4) • be well prepared (1) 	Teacher engagement
<ul style="list-style-type: none"> • The strong help the week (3) • Invite to dialogue (1) • Pay attention to pupils input (2) • Provide challenges at different levels (5) • Pupils have codetermination (1) • Facilitate teambuilding (2) • Give mastery experiences (5) • Presenting own sport for classmates (1) • Classmates cheering for each other (2) 	Pupils' opportunity to affect the learning climate
<ul style="list-style-type: none"> • Avoid ridicule (5) • Consciously work on the classclimate (6) • Acceptance of failure (4) • Include all pupils (7) • Make pupils confident in each other (4) • Accept each other (5) • Elements of smile and laughter (2) • Emphasize effort rather than performance (3) • Reduced focus on competition, rather encourage cooperation exercises (2) 	The atmosphere

Teacher engagement

This study clearly indicated that PST consider the teachers as key persons, in the process of developing learning climate. Many statements (Table I) highlighted teacher engagement as a precondition for establishing the learning climate. This is consistent with several recent meta-analyses (Cornelius-White, 2007; Roorda, Koomen, Spilt, & Oort, 2011) showing positive correlations between the quality of teacher–pupil relationships and pupils' learning and well-being in school.

Several PST' statements underlined the necessity of a committed teacher in creating a learning climate, and they pointed out the importance of teachers demonstrating engagement and enjoyment of participating in PE. This was clearly expressed in the following quotes:

It is all about the energy that a teacher bothers to put into the work.

Teachers show the enjoyment of being active.

These statements were consistent with the main findings in the meta-analyses cited above (Hattie, 2009; Nordenbo et al., 2008). A synthesis of earlier research describes various dimensions of teaching practices that pupils perceive as important for learning outcomes and well-being, such as academic, emotional and autonomy support, as well as taking a goal-centred approach (Ames, 1992; Deci & Ryan, 1985; Nicholls, 1989). However, we observe that the PST are very general in their descriptions. They do not use the terms “academic support”, “emotional support” or “autonomy support”.

A pre-service teacher must understand a wide range of topics concerning learning, social and cultural context, and teaching practice (Darling-Hammond, 2006). However, to establish the learning climate requires a balance between autonomy, emotional and academic support, and becoming an expert requires learning to make subtle distinctions (Dreyfus & Dreyfus, 2005). That is, a lack of focus on autonomy support may signal that the PST are not aware of the importance of permitting pupils to exercise co-determination in their own learning processes, indicating that this is not considered important. Similarly, the absence of any mention of academic support may be a result of the prevailing ideology in PE, “pedagogistic ideology” (Crum, 1993, p. 344), but

may also indicate how the subject is presented in teacher education. In “pedagogistic ideology”, the subject is considered as a tool to achieve health benefits, social learning and recreation, instead of focusing on the subject’s intrinsic value, represented by motion learning, movement skills and body awareness, or “Movement Culture” (Crum, 1993, p. 341). Such an absence of professional concepts indicate that PST are at the novice stage, relative to the terms used by Dreyfus et al. (1987).

Pupils’ impact on learning climate

A pupil culture that supports learning, and is attractive for the performance of schoolwork, will contribute positively to pupils’ learning outcomes (Hattie, 2009). The interviews revealed that PST argue that pupils have a shared responsibility for shaping the learning climate. This means that the pupils help and accept each other regardless of skill level, and at all times seek to do their best. Our study showed that PST place great emphasis on the relationship between teacher and pupil, and among pupils. They highlighted their mutual responsibility to promote the learning climate. This can be illustrated by the following quotes:

The strong help the weak.

Pupils show involvement.

Everyone should accept others.

Malecki and Demaray (2006) point out that positive relationships between classmates are closely linked with good learning outcomes and well-being in school. The PST underlined the importance of good relations between pupils to achieve well-being in the lessons, but they did not emphasize the importance of good relations between pupils for enhanced learning outcomes. This indicates that they are not quite aware of the close relationship between academic and social learning and their mutual influence.

Furthermore, the PST suggested that pupils could undertake tasks that were unfamiliar to most of them. In this way, they want to place pupils on an equal basis, which may mean that the so-called gifted pupils must also work to master the task:

You can introduce exercises where those who normally demonstrate mastery will experience failure, which will have an impact on them as well, for example in how they judge others, such as those who are weak in other activities.

The PST showed that they are aware that the teacher, through active steps, can involve pupils in establishing a learning climate that promotes learning and sense of belonging. Most statements concerned emotional support; statements seldom concerned academic matters.

The atmosphere in a teaching situation

According to the PST’ statements, they emphasized that the learning climate should be characterized by mutual respect, acceptance of failure, ability to appreciate others’ progress and a focus on process rather than achievement. Several statements commented on the importance of providing PST with mastery experiences, and that this happens best in a climate where there is acceptance of trial and error. This was illustrated in these selected quotes:

No one should be laughed at.

Personal development and lifting themselves, yes, but not necessarily at the expense of others.

If someone throws a ball wrong, it’s okay. That’s okay, this is not for a World Cup medal. It should be fun; that’s what’s important. The focus is not on winning.

This is consistent with the findings of Hagger and Chatzisarantis (2007) and Ommundsen and Kvalø (2007), who incorporate elements of autonomy and social affiliation from Self Determination Theory in the concept of motivational climate. In agreement with Self Determination Theory (Deci & Ryan, 1985), we found many statements that emphasized the importance of providing emotional support, and by reinforcing emotional support teachers can promote a sense of belonging among pupils.

The PST claimed that issues related to learning climate had been treated superficially up to their current stage of teacher education (the first three semesters). Theories related to varying goal orientations and their consequences for pupils’ motivation and learning outcomes were first introduced to them in the PE Teacher Programme (4th semester).

The statements indicated that the respondents were concerned about creating a mastery-oriented motivational climate. Efforts was made to provide room for belonging and personal improvement (process) as well as to reduce the focus on pupils comparing themselves with other pupils (achievement). However, it was difficult to determine whether the PE Teacher Program so far, had developed PST’ skills in this field. They appeared to look for surface attributes, and showed little ability to identify how interactions in class were connected. This was not expressed in terms of expectations for clear learning outcomes in PE, and this violates the intent that the curriculum should have clear learning objectives. Teacher education has an important role in meeting this obligation, and have to focus on how PST can support pupils’ learning.

To what extent are these elements evident in their teaching?

The PST proposed many initiatives for arranging the learning climate in PE. Analyzing the interviews, we saw that the PST are keen to appear as dedicated teachers who want to offer challenging lessons. They

emphasized the importance of an active, motivating teacher who shows joy in teaching situation. How this was expressed in the PST's own teaching was illustrated by the coding of PST teaching lessons (Table II).

Table II. Scoring of students teaching lessons (CLASS-manual)

	S1,L1	S1,L2	S2,L1	S2,L2	S3,L1	S3,L2	S4,L1	S4,L2	Average
Positive Climate	3	6	3	4	4	5	4	4	4.125
Teacher Sensitivity	4	6	3	4	3	4	6	5	3.750
Regard for Adolescent Perspectives	3	5	2	2	3	3	3	3	3.000
Behavior Management	2	7	4	4	6	6	6	6	5.125
Productivity	5	6	4	4	4	6	7	7	5.375
Negative Climate	3	1	2	2	1	1	1	1	1.500
Instructional Learning Formats	4	6	4	4	3	4	6	6	4.625
Content Understanding	2	5	3	5	2	2	5	4	3.500
Analysis and Inquiry	1	3	1	1	1	1	1	1	1.250
Quality of Feedback	2	3	2	3	2	2	4	3	2.625
Instructional Dialogue	2	4	2	2	2	2	2	2	2.250
Student Engagement	5	6	4	4	4	5	6	6	5.000

The results that emerged in table II showed that PST score medium on Emotional Support, high-middle on Classroom Organization and low on most of the indicators of Instructional Support.

This study indicated that PST are primarily organizers, concerning about high activity level and pupils' well-being, without emphasizing their role in supervising, motivating and impact on pupils learning outcome. They were not taking advantage of the potential of the activity, to let pupils help each other. This can be illustrated with an example from skating lessons (School 4, Lesson 1). In this skating lesson, we noted wide variation in skill level among pupils in the class. Two pupils were active hockey players, but most had very limited experience with skating. This gave the opportunity to utilize the expertise of peers, using the skilled as models and as assistants in teaching. PST did not make use of this resource, but chose to face all pupils with the same subtasks.

Based on our analyses, it appears that PST did not emphasize the quality of pupils' work, or challenged them in relation to collaboration and learning outcome. During one of the lessons, the pupils were located on workstations while the PST went around and observed (School 3, Lesson 1). Several pupils struggled with basic elements of the exercise «Forward roll» (chin on chest, curved back, arms position etc), but did not get feedback related to these factors. Pupils were not encouraged to cooperate with classmates, and the PST made little use of models that could help pupils in their work. We noted a low level of Instructional Support. These examples demonstrated their willingness to direct their energy towards achieving the learning climate, but their focus was on emotional support. This was also clearly expressed in the following statement:

It's important to have a good class environment, and maybe team building... I'm really a fan of a safe climate, where nothing is embarrassing.

However, we found one statement that stands out from the others:

Now we have heard a lot about performance-oriented and mastery-oriented learning environments and climates in physical education, and before I started here, I had never given much thought to this. Just to hear such a comment, to see winners who just want to win, I do not know if I would have reacted as much as I do now. Now I know that I must do something here, get them to think that they have mastered something, rather than to beat all. That is not what's important. For although competition can be useful sometimes, we ensure that mastery is in focus. It's not something we would have thought about if we hadn't studied physical education.

This pre-service teacher used appropriate course literature in his own reflections. He showed the ability to use knowledge acquired through study when he reflects, and expressed the view that teacher education had helped develop his understanding of PE. He stressed the importance of providing PST with challenging tasks and mastery experiences, and highlighted the PE Teacher Programmes' impact on his teaching practice

The statement above are in line with the basic ideas of Self Determination Theory (Deci & Ryan, 1985) and Achievement Goal Theory (Nicholls, 1989). It is positive that PST were aware of these parallels. It shows that the PE Teacher Program helps to shape PST' views of learning, and that to a certain extent, they were able to utilize this knowledge when they faced professional challenges. PST need highly refined knowledge and skills to assess pupils' learning, and they need a wide repertoire of practices (Darling-Hammond, 2006). It is crucial that teacher education facilitates such opportunities.

We saw, however few traces of this thinking in PST' lessons. Purposeful use of content-focused discussions (Instructional dialogue) among PST and pupils related to skill development were rarely used. The pupils received limited assistance, hints or prompting (Quality of feedback) from PST or peers when participating in class work, but were left to complete work without such assistance. This was evident in most teaching sessions (Table II). Hence, we noticed a large discrepancy between what PST said and what they really did.

A characteristic of most participants' statements and practices in this study, were their lack of depth and reflection. They pointed out important overarching strategies without touching on specific actions to achieve these; for example, we found no suggestions for improving relations between the teacher and pupils, and among pupils. They were also keen to make clear rules for the classroom, which would create safe and stimulating frameworks for teaching. This is consistent with studies (Benner & Tanner, 1987; Dreyfus et al., 1987) showing that novice professionals tend to govern their practices with rule-oriented behaviour. Because novices have little experience with real situations, they must rely on the rules they have learned in their education to function.

Conclusion

In this study, PST' statements and actions appeared to be superficial and very general, and rarely supported by relevant literature. The participants had only to a small degree established meaningful patterns of information; therefore, they tended to notice very little of what happens in the domain of learning climate. Normally, the teaching process begins with the teacher deconstructing the task (Bereiter & Scardamalia, 1993), but in this study, the PST seem unable to deconstruct the concept of learning climate. It seems that the cognitive basis for deeper understanding is missing. Their education on campus has apparently had little effect in raising their level of reflection and understanding. Based on the findings of Tsangaridou and Polemitou (2015), we expected that the PE Teacher Programme would have raised the PST to stages 2 or 3 (advanced beginner or competent) and that they were able to reflect upon the learning climate at a higher level, but this was not the case. Their statements were characterized by a simple and superficial language, indicating that they are at the earliest stages of the Dreyfus Model of Skill Acquisition.

Perhaps, it's time to raise the question regarding the progression in the PETE. How is it possible to develop more knowledge of PE when they do not have more than 30 or 60 credits related to the subject? It seems that PST find it difficult to transfer the general knowledge they have acquired through the curriculum of the first three semesters, into their own physical education teaching. In addition, it will be difficult to expect both learning and unlearning within such a limited time.

The PE Teacher Programme provides PST with a theoretical introduction to Self Determination Theory and Achievement Goal Theory, but only to a small degree, highlights the practical implications of these theories for learning climate. Here we have the challenge of linking theoretical and practical lessons in an appropriate manner. A first step might be that the PE Teacher Programme is placing greater emphasis on developing a collaborative culture within the professional team. This can be done by co-ordinating topic plans in a more efficient manner, so that theoretical topics will be examined and debated in practical sessions. Another essential measures will be to establish academic forums where staff regularly discuss and challenge each other's basic values, to ensure that they communicate the same attitudes. For example, it is important to clarify whether it is didactic questions that should be accentuated, or whether it is to develop students' personal skills in various sports. The period allocated for pre-service teacher instruction (the instruction of PST by their own peers) is the only opportunity the PST have to test their own practical teaching programmes. By increasing the number of exercise periods with pre-service teacher instruction, we would expand training opportunities.

Through the field practice, PST will gain opportunities to follow up their lessons from campus. The benefit of this practice is highly dependent on the quality of the mentor. From a social constructivist perspective, mentoring is intended to stimulate PST' critical reflection upon their own learning, and help them to develop their own teaching practices (Tsangaridou & Polemitou, 2015; Wang & Odell, 2002; Helgevold, Næsheim-Bjørkvik and Østrem, 2015).

This study reveals a need for a greater focus on learning climate in the PETE-program. First, it is important that PST develop a common understanding of the concept of learning climate that corresponds with the current literature. In addition, PE Teacher Program have to enhance PST' opportunities to practice and reflect upon their own teaching.

Participants in this study were all PST from the same university. For that reason, the findings are only partially generalizable to other educational institutions and their fields of practice.

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