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Student teachers' situational engagement during teaching practice in Finland and South Africa

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ABSTRACT

This article reports the outcomes of research on student teachers' situational engagement during their third-year teaching practice in university-affiliated teaching schools (teacher training schools) at the universities of Helsinki, Finland and Johannesburg, South Africa. We have explored situations that possibly engage the student teachers during the teaching practice related to learning, social interaction, working with different domains of teacher knowledge and sourcing from different origins. We have approached the experience of engagement the in the context of flow theory. For the experience sampling measurement, we operationalised engagement as a state of involvement in a learning task identified by higher-than-average individual states of interest, skill and challenge in a situation. In Johannesburg, 42% of all situations were engaging for students compared to 29% in Helsinki. The results emphasise the significance of personal interaction with mentors and university lecturers in supporting engagement. The student teachers found teaching, planning and reflecting on their lessons more engaging than other activities or informal discussions. Students at both universities experienced similar amounts of SMK, PCK and GPK and found working with these categories of knowledge engaging. It is important to include teaching practice in teacher education programmes and organise it in university-affiliated teacher training schools, where mentors can scaffold the students' reflection process, support the students in combining theoretical and practical perspectives of the teaching profession and guide students to seek information from various knowledge sources.

Introduction

Student engagement in the higher education context is widely recognized as important from the viewpoint of achievement and learning. Kahu and Nelson (2018) argue that students who are engaged with their studies are more likely to be successful in their studies. In this research, we focus on individual students' engagement in learning from practice during a teaching placement period in a teacher training school.

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The term engagement is used differently in various contexts, and it has multiple interpretations (Evans et al., 2015; Kahu & Nelson, 2018; Macfarlane & Tomlinson, 2017; Trowler, 2010). Broad and general definitions of the concept result in difficulties in measuring the experience of engagement. For example, Halverson and Graham (2019) refer to engagement as the involvement of the student's cognitive and emotional energy to accomplish a learning task, which may be difficult to operationalize to be used in a research instrument. This research contributes to the process of operationalizing the concept of situational engagement in teaching practice by identifying the moments in which the students report experiencing engagement. Through employing the experience sampling method (ESM) we explore what types of activities and interactions support student teachers' engagement during their teaching practice. We also examine how engaging student teachers experience working with different domains of teacher knowledge, sourcing from different origins.

The context of this study is the third-year teaching practice in university-affiliated teaching schools (teacher training schools) at the University of Helsinki in Finland and the University of Johannesburg in South Africa. Finland has a 50-year tradition of practicing teaching in teaching schools that are part of Faculties of Education. In 2010, a teaching school was established at the University of Johannesburg based on the Finnish model. The two very different contexts employed in this research help us to extract the optimal context for the experience of engagement. Knowledge about student teachers' engagement during teaching practice helps teacher educators or mentor teachers develop activities that support student teachers' learning from practice in the Finnish and South African context.

Student teachers' engagement in teaching practice

Fredricks et al. (2004) have reviewed the various definitions of engagement concept, ending up with a suggestion that engagement should be used as a meta-level construct that encompasses *behavioral*, *emotional* and *cognitive* components, which are positively associated and overlap to some extent (Appleton et al., 2008; Fredricks et al., 2004). Groccia (2018) proposes a similar model with slightly different concepts: doing (behavioral component), feeling (emotional component) and thinking (cognitive component) as the core of engagement. The *behavioral component of engagement* relates to involvement in learning and academic tasks and includes behaviors such as effort, persistence, concentration, attention, asking questions, and contributing to class discussion (Fredricks et al., 2004). Hands-on collaboration (Kim et al., 2015) and dialogic interaction are common approaches to engage people in learning (Juuti et al., 2020), and they are characteristic of teaching practice. Persistence can be supported through interaction that is supportive and explicates the power of practice in acquiring new skills and knowledge (Vuorinen et al., 2019). In the teaching practicum, student teachers learn in various hands-on situations. They observe, plan and teach lessons alone and in pairs or groups, participate in informal discussions and more formal reflection discussions with their mentor teacher and university lecturer, they participate in lectures, workshops, tutor sessions and groupwork sessions, and other situations that may take place within the school year, like special occasions, ceremonies, theme days, concerts,

field trips, out-of-classroom lessons, visits and so on, and they meet a wide variety of study materials from different origins. As presence in these activities is compulsory, the student teachers at least carry out the activities, but at best, behavioral engagement is a flow-like experience (Salmela-Aro, 2018) with high concentration and absorption in the task.

The *emotional component of engagement* relates to emotional reactions to aspects of studying, such as feelings of enjoyment and perseverance. Together with motivation, learning strategies and competence beliefs, emotions have an essential influence on subsequent performance (Putwain et al., 2018). Positive emotions associated with a task may facilitate the reaching of goals, whereas negative emotions may impair performance (Pekrun et al., 2018). In the context of teaching practice, both positive and negative emotions may emerge. The individual emotional experiences of students should be accepted and reflected to turn them into constructive experiences (Pekrun et al., 2018). The reflection discussion after the lessons that student teachers teach should happen in an emotionally positive atmosphere that supports students' self-confidence and interest and is focused on mastery instead of performance.

The *cognitive component of engagement* relates to commitment through reaching the aims that are set and the willingness to invest cognitive potential in adopting new knowledge and skills or overcoming a challenge in a learning situation (Marks, 2000). Self-regulation and effective use of deep learning strategies are also aspects of the cognitive component of engagement (Fredricks et al., 2004; Ravindran et al., 2005). In the context of teaching practice, students' cognitive engagement can be supported through reflection discussion in which the mentor teacher helps the students to see the connection between theoretical constructs and practice. In general, a better quality teacher-student relationship is associated with higher levels of engagement (Quin, 2017).

Kahu (2013) approaches engagement as a process and makes a distinction between the antecedents of engagement, engagement *per se* (as defined through the outlined components) and the consequences of engagement. Structural aspects that precede engagement can be student-related (student's background, support and life-load), or university-related (the culture that includes assessment and curriculum). Psychosocial antecedents of engagement can be university-related (teaching, staff, support and workload) or individual (motivation, identity, self-efficacy and skills). In the context of higher education, Kahu (2013) proposed a bi-directional relationship between engagement and its proximal consequences (learning, achievement, satisfaction and wellbeing), resulting in better achievements and higher self-beliefs. The distal consequences, such as life-long learning and success at work, are results of the proximal consequences.

Teacher students' engagement in the various situations related to teaching practice can be promoted through supporting different components of engagement. Macfarlane and Tomlinson (2017) propose that teaching strategies that employ active and experiential approaches, support student engagement by activating the behavioral component of engagement. Kahu et al. (2017) argues that triggered situational interest enhances behavioral and cognitive engagement. Situational interest can be promoted in a learning situation during the teaching practice by choosing appropriate teaching/learning materials and teaching methods or pedagogical activities, such as planning or reflecting on a lesson (Hunsu et al., 2017). However, Bryson and Hand (2007) argue that even the

most intensive actions with the task do not always guarantee engagement. They found that higher education students invested considerable time and effort in the task just to achieve an outcome, but the activity itself was not experienced as engaging. According to Muukkonen et al. (2008), primary student teachers find small group situations the most engaging (40%) among the different learning situations. Lectures, which engage 20% of students, operationalize engagement based on levels of challenge and competence. In their research on student-activating lecture courses, Lonka and Ketonen (2012) grouped kindergarten and elementary teacher students based on their profiles, and 36% of their participants belonged to the engaged group, which was characterized by high levels of challenge and strong evaluations of competence.

Situational engagement

Situational engagement is a momentary experience related to interaction with an object. Ashwin and McVitty (2015) claim that the object of engagement is not always clearly defined, and engagement in learning can refer to many aspects of learning. They continue that knowing what the students are engaged with is critical, because the meaning of student engagement changes when the object of engagement changes (p. 344). An activity or task can be considered an object of engagement. For example, when planning a lesson in teaching practice, students may first be engaged in deciding about the aims of the lesson according to the curriculum, but when they proceed, they may get ideas of activities they can employ to reach these aims. Their focus and hence their object of engagement shifts from the aims of the lesson to the activities of the lesson.

To operationalize the concept of engagement, we decided to follow Csikszentmihalyi's (1990) flow theory, because it proposes three pre-conditions for engagement that are measurable with a questionnaire: interest, skill, and challenge. To be engaged in a teaching practice situation, a student should experience situational interest and challenge in the task, and skill or competence to undertake the task (Csikszentmihalyi, 2014; Schneider et al., 2016). All three pre-conditions for engagement stated in flow theory—interest, skill and challenge—relate to cognitive, emotional and behavioral components of engagement. Engaged students invest their cognitive potential to learn new knowledge and skills. From a behavioral engagement point of view, in a flow state engaged students are mentally and physically present and involved in the situation. Situational interest is related to all components of engagement—behavioral, emotional and cognitive. It is a predictor and pre-condition for engagement (Csikszentmihalyi, 2014; Flowerday et al., 2004; Wang et al., 2021). Like engagement, situational interest always emerges as result of interaction with an object (Krapp & Prenzel, 2011). Silvia (2008) argues that the behavioral component of interest includes facial expressions and approach-oriented actions. If considered a psychological state, interest has features of positive activating emotions (Lonka & Ketonen, 2012; Silvia, 2008). Interest also has a cognitive component (Lonka & Ketonen, 2012) as it is characterized by increased attention and concentration (Hidi, 2006, p. 70), and it motivates exploration and information seeking (Ainley & Hidi, 2014). Skill is defined as a task- specific mastery needed to complete a task. When a student feels skilled, they believe they can master the ongoing task, which keeps them working toward the aim (Brophy, 2008). Academic challenge is defined as a desire to persist in a learning situation (Eccles &

Wigfield, 2002). Therefore, challenge is seen as a positive state when the students' skills meet the demands of the task. The balance between skill and challenge is important because other emotional states, such as relaxation, boredom, stress and anxiety, compete with situational engagement (Nakamura & Csikszentmihalyi, 2014; Shernoff & Csikszentmihalyi, 2009).

Teacher knowledge in teaching practice

This study incorporated Shulman's (1986, 1987) classification of teacher knowledge domains as a framework for analyzing what different knowledge domains student teachers experienced while planning, teaching and reflecting in different teaching-practice situations. The framework categorizes teacher knowledge into subject matter knowledge (SMK), general pedagogical knowledge (GPK) and pedagogical content knowledge (PCK) (Carlsen, 1999; Gess-Newsome & Lederman, 1999; Grossman, 1990; Hashweh, 2005). GPK consists of the following knowledge areas: (1) classroom management and organization, (2) instructional models and strategies and (3) classroom communication and discourse (Morine-Dershimer & Kent, 1999). PCK (Carlsen, 1999; Shulman, 1987) can be seen as the synthesis of the combined knowledge needed to teach a certain topic, and thus it always relates to SMK (Grossman, 1990; Nilsson, 2008). According to Gess-Newsome (1999), the following components constitute PCK: knowledge of teaching or instructional strategies, assessment strategies and collaboration strategies; knowledge about student interest, motivation and the learning of conceptual and procedural knowledge and skills; knowledge of learners, such as student thinking, misconceptions and cognitive and affective demands of tasks and activities; and curriculum knowledge and knowledge about the resources available to support teaching (Abell et al., 2009). In the European tradition, especially in Germany, France and the Nordic countries, including Finland, the term 'didactics', or more precisely, 'didactical transformation' (in German, *didaktische transformation)* (Kansanen, 2002), captures processes that are similar to those for which a teacher needs PCK. The teaching practice is subject-didactics oriented: in other words one important aim is to learn to plan, implement and evaluate lessons within fields of different school subjects, to understand the different epistemic starting points of different subjects and acknowledge differences in knowledge formation. The relation to subject didactics is the reason why we include PCK in our study, despite the fact that critique of the concept have been expressed in the field of educational research (Abell, 2008; Settlage, 2013). Besides the categories of SMK, GPK and PCK, Gess-Newsome and Lederman (1999) introduced the notion of teachers' *contextual knowledge* and *curriculum knowledge*. This research employs only the categories that are relevant from the viewpoint of the aims of teaching practice in Helsinki and Johannesburg. Student teachers become familiar with different types of generalizable and evidence-based professional knowledge in lectures and workshops by reading scholar books, utilizing research literature and carrying out small-scale educational research projects (Gitlin et al., 1999).

Research questions

In their reviews related to the role of teaching practice in teacher education, Cohen et al. (2013) and Lawson et al. (2015) highlight the fact that teacher education contexts are very

different. Lawson et al. also call for studies that compare teaching practices in different educational contexts. Identifying the situations when students experience engagement and flow-like experiences helps to better understand the concept of engagement in the context of teacher education and in more detail, in teaching practice As Macfarlane and Tomlinson (2017) argue, students' engagement could be supported through approaches, that guide students to active and collaborative learning. However, we are interested in the situational experience of engagement, that happens in relation to an object, which can be an activity or a task, and we aim to examine in more detail, which activities and experiences are most beneficial for engagement. This information may be employed when planning teacher education programmes and considering the role of mentored teaching placement periods in them. The comparison of two very different teacher education contexts helps to extract the most generalizable aspects related to the support for engagement. To operationalize the multi-faceted concept, we have chosen to employ the interest and flow theory, which focuses on the balance between learners' skills and perceived challenge and interest in the task or activity at hand. We assume that the combination of challenge, skill and interest measured in a situation tells us about student teachers' engagement with respect to a particular activity. We thus aim to answer the following research question:

> In which situations do student teachers experience engagement in teaching practice in Helsinki and Johannesburg?

Primary school teacher education in Finland and South Africa

As follows, we introduce the central features of both teacher education programmes of this research. Subsequently, we present the aims, which describe the types of teacher knowledge to be learnt during the teaching practice in both teacher education programmes. In Finland, educational equality is a fundamental value in education, and all learners learn in heterogeneous, inclusive classrooms (Darling-Hammond, 2017). Decision-making power is decentralized to the local level of the school, and each municipality (district) is responsible for planning the local curriculum, together with teachers, in accordance with the national core curriculum (NCCBE, 2014) and for monitoring the quality of education. Student teachers are thus trained to work in a system that gives them much autonomy in the classroom. Primary school teachers are educated in a five-year master level programme. The specific practice period in the third year aims to support the development of Finnish student teachers' teaching practices in the following ways (related type of teacher knowledge in parentheses). These aims are divided into more specific aims:

- Analyze learning processes and learning environments (GPK).
- Analyze and implement different pedagogical approaches, teaching methods and learning materials while teaching and learning school subjects (PCK).
- Develop a readiness for collaborative planning processes [of lessons] in primary education (PCK, GPK).
- Develop a readiness for co-teaching and to support different pupils' needs in learning (PCK, GPK).
- Analyze and reflect on one's own teaching in the context of the school curriculum and personal and official aims of the teaching practice (PCK).

Pairs of student teachers teach 50 lessons in five different school subjects over six weeks, and they participate in supervision and reflection sessions with a mentor teacher and university lecturer/s in the planning phase and after each lesson. Usually, in these sessions, the classroom activities are discussed at a more conceptual level, and the phenomena and happenings of the lesson are linked with educational theories. For example, student teachers' experience of pupils' level of interest during a lesson can be scrutinized from the perspective of the interest development theory (Hidi & Renninger, 2006). At the end of the teaching practice, a final written reflective report on the teaching practice is completed. The total number of lessons spent in school during the teaching practice depends on which grade the students are practicing and how many lessons they observe before and between the lessons they teach.

In South Africa, the school system is highly centralized, and teaching is monitored by district officials. The national education department prescribes a single, encompassing national curriculum—the Curriculum Assessment Policy Statement (CAPS)—for all primary schools (Department of Basic Education & Republic of South Africa, 2011). Primary school teachers are educated with a four-year Bachelor of Education degree. Student teachers complete practice teaching periods of between 20 and 32 weeks over the course of their degree in various school settings, with the expectation that they will be supervised and formally assessed by mentor teachers. The teaching practice is organized to include two consecutive block periods in six-week cycles, during which the student teachers observe classrooms, assist, and plan and teach lessons under the supervision of practicing teachers, who are also regarded as student mentors. Students prepare lessons in groups of 10 under the guidance of a lecturer at the university, which they teach twice. A school-teacher and a university lecturer together assess the school lesson and provide feedback. Students also assess one another's work. The third year of the course has the following aims for student learning:

- Identify, recognize and analyze teaching practices in different classrooms (PCK, GPK).
- Analyze how learners' development intersects with the expectations and implementation of the school curriculum (PCK).
- Design and implement age- and grade-appropriate pedagogical approaches and methods accompanied by suitable learning support (PCK, GPK).
- Participate in student group planning for school teaching practice and thus learn to work collaboratively (PCK).

Methods and data analysis

Experience sampling method

This article focuses on student teachers' situational experiences in the teaching practice context. To define experience, we follow Hektner et al. (2007) as they define it as any content of consciousness, thoughts, feelings and sensations. However, tracking the experiences in a reliable way is difficult because the events in a certain context follow each other and constitute a continuously changing stream of experiences, and restoring the explicit moment and the aspects related to them may be difficult. Data

collection in real situations helps to reduce general recall bias and specific instances that may overshadow 'a true response to a real situation' (Schneider et al., 2016). The ESM is used to collect situational experiences through self-reporting (Hektner et al., 2007), usually over several days (Katz-Buonincontro & Hektner, 2014). According to Hektner et al. (2007), the ESM is considered a reliable and useful self-reporting means for capturing subjective experiences, behavior or feelings across multiple contexts. ESM data can be collected through traditional paper questionnaires or by using mobile devices (Katz-Buonincontro & Hektner, 2014; Litmanen et al., 2012; Schneider et al., 2016). The disadvantage of ESM is that it interferes with the situation, which may have an impact on the answers. However, Hektner et al. (2007) and Jeong (2005) addressed these concerns and claimed that this data collection method does not significantly affect the quality of the data, especially when compared to other types of data collection. In this research, we employed ESM to chart the pre-service teachers' experience of engagement in learning from practice situations. The students evaluated the different components of engagement, namely experienced academic challenge, skill and interest in different situations via a web-based questionnaire. Because the data collection lasted three weeks and was intensive and burdensome, thus influencing non-responses, we offered movie tickets for participants to support active participation in the data collection process (Jeong, 2005).

ESM questionnaire

For the ESM measurement, we operationalized engagement as a state of involvement in a learning task identified by a higher-than-average level of interest, skill and academic challenge (Eccles & Wang, 2012; Reschly & Christenson, 2012). With the same questionnaire we examined what the student teachers were involved with at the moment of responding. The ESM questionnaire was designed, through an iterative process during 2018, in collaboration with Finnish and South African researchers. In January 2018, in Johannesburg, a prototype ESM questionnaire was designed in a collaborative workshop based on the literature review. Especially the knowledge-related aims of the teaching practice influenced the preparation of the questionnaire. The English language prototype questionnaire was translated into Finnish by two researchers who were familiar with teacher education practices in Helsinki. The prototype was tested during March and April 2018. The outcomes of the pilot test were analyzed, and the questionnaire was re-designed in August 2018. There were several items with low frequency. For example, the item "studying home language content" was selected only four times. Furthermore, the questionnaire was too long, and the students did not answer all the items. We decided to decrease the number of items and shorten the ones we kept. Moreover, we grouped visual art, music, sport, and other art subjects under art subjects, and we grouped science, history, geography, and ethics under science subjects. The iterative process of questionnaire development was conducted to increase the validity of the questionnaire.

The questionnaire items are presented in Figure 1.

Engagement in learning questionnaire

Background questions

Username (Use the same username in all questionnaires):

Gender
- [ ] Male
- [ ] Female

Which year student are you?
- [ ] 3rd year
- [ ] 4th year

Which grade are you observing/planning/teaching when you received the link?
- [ ] R
- [ ] 1
- [ ] 2
- [ ] 3
- [ ] 4
- [ ] 5
- [ ] 6
- [ ] 7

Activity just before you got the request to respond to this questionnaire

What were you doing when you got the request to respond to this questionnaire? Select all possible alternatives.
- [ ] following a lesson
- [ ] planning a lesson
- [ ] teaching a lesson
- [ ] evaluating/reflecting on teaching of a lesson
- [ ] participating in an informal discussion related to the teaching practice
- [ ] participating in a workshop, tutor session/groupwork
- [ ] participating in a lecture
- [ ] other activity

Please, write briefly about what you were doing. I was busy

What was the topic of the activity? Select all possible alternatives.
- [ ] school mathematics
- [ ] home language writing
- [ ] home language reading
- [ ] science, history, other non-art subject
- [ ] visual art, music, sport, other art subject
- [ ] instructional methods
- [ ] learners' needs/challenges/difficulties
- [ ] classroom managemnet
- [ ] topics related to learners' interest and motivation
- [ ] classroom communication/ discussion
- [ ] learning environments
- [ ] concepts to be taught according to the curriculum
- [ ] other topic

Who was with you?
- [ ] alone
- [ ] in a pair
- [ ] in a group
- [ ] with a mentor teacher
- [ ] with an university teacher
- [ ] other person

How/where did you find information to use at that moment?
- [ ] in a course book/schoolbook/
- [ ] on the Internet (web page, course platform)
- [ ] from the university lecture/workshop
- [ ] from the university teacher during the teaching practice
- [ ] from the mentor teacher
- [ ] from the other student
- [ ] through observing environment/nature
- [ ] other source

Questions about the situation just before starting answering

How did you feel about what you were busy doing - just before we interrupted you? (Scale: 1 = not at all ... 4 = very much)

	1	2	3	4
Were you interested in what you were doing?	○	○	○	○
Did you feel proficient/skilled at what you were doing?	○	○	○	○
Did you feel challenged by what you were doing?	○	○	○	○
Did you enjoy what you were doing?	○	○	○	○
Were you succeeding?	○	○	○	○
Did you have stress?	○	○	○	○

During the last hour I have been thinking about:
- [ ] use of university course content
- [ ] curriculum as a starting point for the planning of teaching
- [ ] role of the teacher
- [ ] children's ideas
- [ ] how children learn
- [ ] learning material
- [ ] use of technology in teaching
- [ ] the vision of teacher education in your program

Proceed

[Save]

Figure 1. The final ESM questionnaire.

Procedure

The data collection was conducted from 17 September 2018 to 8 February 2019 in Helsinki and from 10 January to 31 October 2019 in Johannesburg. In Helsinki, a relatively long period was needed because the data were collected during three different teaching practice periods. Student teachers were asked to participate in the study voluntarily during the first meeting of the teaching practice period. The schedule for sending out the questionnaire was randomly established. The invitation to respond in randomly selected situations was organized through WhatsApp. The message included a short and encouraging message and a link to the ESM questionnaire, which made it possible for the student teachers to answer the questionnaire directly on their mobile phones.

In Helsinki, 74 students participated in three practice periods, and 71 (96%) of those answered at least 25 of all possible 45 times. Altogether, they answered 2,370 (82%) times for all possible 3,195 data collection situations. In Johannesburg, 170 students answered the ESM questionnaire during six teaching practice periods for a total of 1,339 times. They had the opportunity to answer 15 times in a two-week period; consequently, the response rate was 53%. The smaller number of answers in Johannesburg was the consequence of short teaching practice periods, faculty lectures after lunch time, and the challenges caused by weak Internet connections. However, we wanted the data collection to cover the whole teaching practice period, not just a sample. We also wanted to offer all students the opportunity to answer. Therefore, the sample sizes are different.

According to Hektner et al. (2007), there are aspects that may threat the validity and reliability of ESM questionnaires. Traditionally, validity and reliability of the measurement can be increased by measuring a construct with several items that use one scale. In the ESM questionnaire, only one question was used to measure a topic, and therefore the number of answers and the response rate become important metrics related to reliability (van Berkel et al., 2019).

Data analysis

We report the frequencies of different types of activities that student teachers experienced in randomly selected situations during the teaching practices separately in Helsinki and Johannesburg. We also report the percentages of situations in which students reported being engaged in the activity. Pearson's 2×2 contingency chi-square tests were performed to analyze the differences between the levels of engagement among students in Helsinki and Johannesburg for the different variables (Barnard, 1947). The columns in the contingency table represent different contexts, and the rows represent frequencies of the situations in which students report having been engaged or not engaged. A student was considered engaged (=1) in the activity when they simultaneously reported high levels (a Likert score of 3 or 4) of challenge, skill and interest. If one or more of these pre-conditions for engagement was 1 or 2, then the response was counted as not engaged in the activity (=0).

Results

Table 1 shows the frequency of different types of social interaction that the student teachers experienced in randomly selected situations during the teaching practices in

Table 1. Level of engagement in different interaction situations.

	Helsinki			Johannesburg			χ^c
	f	%[a]	% eng.[b]	f	%[a]	% eng.[b]	
Alone	355	15%	16%	67	5%	45%	28.4*** (1, $N = 422$)
In a pair	1731	73%	30%	350	26%	50%	52.4*** (1, $N = 2081$)
In a group	278	12%	27%	687	51%	37%	8.8** (1, $N = 965$)
With a mentor teacher	561	24%	36%	567	42%	42%	4.2[ns] (1, $N = 1128$)
With an university teacher	134	6%	32%	102	8%	41%	2.0[ns] (1, $N = 236$)
Other person	230	10%	30%	44	3%	57%	11.8*** (1, $N = 274$)
All interaction situations	3289			1816			

Notes: [a]Percentage of interaction situations is calculated from total number of answers $N_H = 2370$ and $N_J = 1339$.
[b]Percentage of situations experienced as engaged, calculated for a certain interaction situation.
[c]A chi-square test compares the difference between the level of engagement in an interaction situations in Helsinki and Johannesburg.
Abbreviation: ns, not statistically significant.
*$p < 0.05$;. **$p < 0.01$;. ***$p < 0.001$.

Table 2. Level of engagement in different situations.

	Helsinki			Johannesburg			χ^c
	f	%[a]	% eng.[b]	f	%[a]	% eng.[b]	
Teaching a lesson	682	29%	40%	139	10%	51%	5.8* (1, $N = 821$)
Planning a lesson	587	25%	27%	103	8%	55%	33.0*** (1, $N = 690$)
Reflecting on lesson	324	14%	27%	130	10%	40%	7.6** (1, $N = 454$)
Informal discussion	239	10%	20%	167	12%	37%	14.5*** (1, $N = 406$)
Following a lesson	102	4%	8%	644	48%	38%	35.8*** (1, $N = 746$)
Participating a lecture in teaching school	40	2%	18%	36	3%	47%	7.7*** (1, $N = 76$)
Participating a workshop in teaching school	29	1%	38%	48	4%	44%	0.3[ns] (1, $N = 77$)
Other activity	510	22%	15%	257	19%	42%	67.9*** (1, $N = 768$)
All situations	2513			1524			

Notes: [a]Percentage of interaction situations is calculated from total number of answers $N_H = 2370$ and $N_J = 1339$.
[b]Percentage of situations experienced as engaged, calculated for a certain interaction situation.
[c]A chi-square test compares the difference between the level of engagement in an interaction situations in Helsinki and Johannesburg.
Abbreviation: ns, not statistically significant.
*$p < 0.05$;. **$p < 0.01$;. ***$p < 0.001$.

Helsinki and Johannesburg and their engagement in those interaction situations. The student teachers could choose more than one type of interaction. Students in Helsinki reported 'working in pairs' more than students in Johannesburg, whereas 'groupwork' was dominant in the answers among the students in Johannesburg. The students in Helsinki found 'working with a mentor teacher' most engaging, whereas Johannesburg students found 'working in pairs' most engaging. The students in Johannesburg were

Table 3. Engagement related to different domains of teacher knowledge.

	Helsinki			Johannesburg			X^c
	f	%[a]	% eng.[b]	f	%[a]	% eng.[b]	
Subject matter knowledge							
Art subjects	747	32%	29%	73	5%	37%	2.0[ns] (1, $N = 820$)
Science, social science, history	647	27%	31%	153	11%	48%	15.2*** (1, $N = 800$)
School mathematics	527	22%	31%	483	36%	46%	24.1*** (1, $N = 1010$)
Home language writing	93	4%	16%	240	18%	35%	11.4*** (1, $N = 333$)
Home language reading	81	3%	12%	162	12%	38%	17.4*** (1, $N = 243$)
PCK							
Instructional methos	472	20%	24%	59	4%	41%	7.7** (1, $N = 531$)
Motivation and interest	467	20%	28%	33	2%	52%	8.1** (1, $N = 500$)
Learning environments	355	15%	32%	39	3%	33%	.9[ns] (1, $N = 394$)
Planning according to curriculum	317	13%	36%	127	9%	50%	7.5** (1, $N = 445$)
Learners needs	173	7%	31%	38	3%	42%	1.7[ns] (1, $N = 211$)
GPK							
Classroom management	513	22%	30%	88	7%	34%	.4[ns] (1, $N = 601$)
Classroom interaction	505	21%	30%	102	8%	27%	.3[ns] (1, $N = 608$)
Instructional methods	472	20%	32%	59	4%	41%	1.8[ns] (1, $N = 531$)
Other activity	593	25%	20%	184	14%	59%	104*** (1, $N = 777$)
All situations	5882			1840			7.7*** (1, $N = 76$)

Notes: [a]Percentage of interaction situations is calculated from total number of answers $N_H = 2370$ and $N_J = 1339$.
[b]Percentage of situations experienced as engaged, calculated for a certain interaction situation.
[c]A chi-square test compares the difference between the level of engagement in an interaction situations in Helsinki and Johannesburg.
Abbreviation: ns, not statistically significant.
*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

significantly more engaged when working alone, in pairs and with another, undefined person compared to Helsinki students.

Table 2 shows the frequency of different types of activities that the student teachers experienced in randomly selected situations during the teaching practices in Helsinki and Johannesburg and their engagement levels with respect to the different activities. The students may have experienced engagement with different activities simultaneously. The students in Helsinki reported 'teaching a lesson' more frequently than the students in Johannesburg, whereas 'following a lesson' was dominant in the answers of Johannesburg students. This finding may be a result of the different structures of the teaching practices in Helsinki and Johannesburg; Helsinki students teach more hours than Johannesburg students. Students in Johannesburg were significantly more engaged in 'planning a lesson', 'informal discussions', 'following a lesson' and 'participating in lectures' than were the Helsinki students. The highest percentage of engaged students in

Table 4. Engagement related to different origins of teacher knowledge.

	Helsinki			Johannesburg			χ^c
	f	%[a]	% eng.[b]	f	%[a]	% eng. 2)	
In a course book/schoolbook	704	30%	35%	354	26%	43%	6.4* (1, $N = 1058$)
On the Internet (web page, platf.)	698	29%	30%	209	16%	45%	16.3*** (1, $N = 907$)
From the university lecture/ workshop	411	17%	31%	64	5%	44%	4.2* (1, $N = 475$)
From the university teacher (practice situ)	311	13%	33%	81	6%	26%	1.5[ns] (1, $N = 392$)
From the mentor teacher	877	37%	31%	589	44%	41%	15.2*** (1, $N = 1466$)
From the other student	743	31%	29%	140	10%	46%	15.3*** (1, $N = 883$)
Through observing environment/ nature	398	17%	27%	229	17%	40%	11.9*** (1, $N = 627$)
Other source	860	36%	24%	148	11%	37%	11.5*** (1, $N = 1008$)
All situations	5002			1814			

Notes: [a]Percentage of interaction situations is calculated from total number of answers $N_H = 2370$ and $N_J = 1339$.
[b]Percentage of situations experienced as engaged, calculated for a certain interaction situation.
[c]A chi-square test compares the difference between the level of engagement in an interaction situations in Helsinki and Johannesburg.
Abbreviation: ns, not statistically significant.
*$p < 0.05$;. **$p < 0.01$;. ***$p < 0.001$.

Helsinki related to 'teaching a lesson', whereas in Johannesburg, the highest percentage of engaged students related to 'planning a lesson'.

Table 3 shows the types of teacher knowledge that the student teachers reported having experienced in randomly selected situations during the teaching practices in Helsinki and Johannesburg, and their engagement levels when working with different types of teacher knowledge. The students may have experienced several types of teacher knowledge in one situation. The students in Helsinki reported working most with 'art-, science- and history-related content knowledge', whereas the Johannesburg students worked with mathematics content knowledge most often. In Helsinki, 'PCK (planning according to the curriculum)' was found to be most engaging, whereas in Johannesburg, 'PCK (motivation and interest)' was found to be most engaging. The Johannesburg students found working with 'content knowledge related to science, social science, history, mathematics, reading and writing' significantly more engaging than the Helsinki students. Further, the Johannesburg students found working with some aspects of PCK somewhat more engaging than the Helsinki students. There was no statistically significant difference with respect to GPK.

Table 4 shows the origins of teacher knowledge that student teachers experienced in randomly selected situations during their teaching practice in Helsinki and Johannesburg and their engagement with respect to these sources. The students may have experienced various knowledge origins in one situation. The students in Helsinki and Johannesburg reported gaining knowledge from 'the mentor teacher' most often. In Helsinki, the students found searching for knowledge 'from a coursebook or a textbook' most engaging, whereas in Johannesburg, the students found 'getting knowledge from another student through observing' most engaging. Johannesburg students found the

Internet, discussions with mentor teacher and observations to be significantly more engaging knowledge sources than the Helsinki students.

Discussion

To improve teacher education programmes and to understand the concept of engagement more deeply, it is important to determine what engages students in learning in the context of teaching practice (Cohen et al., 2013; Lawson et al., 2015). Supporting engagement is challenging because even the most intensive actions with the tasks do not always guarantee engagement (Bryson & Hand, 2007). However, based on the authors' clinical experience with student teachers' behavior, student teachers tend to be extremely committed to the teaching practice. Therefore, it is interesting to determine whether high-quality mentoring or active learning in a small group best supports the students' engagement when working with the information or knowledge available while learning from various teaching practice activities. Further, our aim has been to operationalize the concept of 'situational engagement' in the context of teaching practice by recognizing the engaging learning situations in teaching practice in two different contexts (Kahu, 2013) and to identify objects of engagement in the context of teaching practice (Ashwin & McVitty, 2015). We operationalize situational engagement as a state of involvement in a learning task represented by higher-than-average (3 or 4 on a 4-point Likert scale) individual states of interest, skill and challenge (Eccles & Wang, 2012; Reschly & Christenson, 2012). We examined the number of engaging situations when student teachers were involved in different interaction situations or types of activities and worked with different domains of teacher knowledge from different sources. These situations cover all typical situations in teaching practice.

Overall, the results showed variations between the frequency of activities in Helsinki and Johannesburg. For example, students in Helsinki most frequently interacted in pairs (73% of all situations), while students in Johannesburg mostly interacted in a group (51% of all situations). In Helsinki, students experienced PCK- and GPK-related information much more frequently than students in Johannesburg because the students in Helsinki spent more time planning and implementing teaching than in Johannesburg. SMK was experienced equally; however, the Johannesburg students found most situations concerning SMK significantly more engaging than the Helsinki students. In Helsinki, the students reported that they acquired knowledge equally from course or schoolbooks, from the internet and from mentor teachers or other student teachers. By contrast, in Johannesburg, the main source of information was the mentor teacher.

In Johannesburg, 42% of all situations were engaging for students compared to 29% in Helsinki. These percentages were higher than those obtained by Muukkonen et al. (2008) for students' engagement in a lecture situation and about the same as those for small group situations. However, Muukkonen et al. operationalized engagement based on the high level of challenge and skill and did not take the students' interest into account, whereas we consider interest an important aspect of engagement (Trowler, 2010). The students in Johannesburg reported being engaged more often than students in Helsinki in most of the situations. Some situations, such as recognizing pupils' needs or topics related to classroom management, showed similar levels of engagement in

Johannesburg and Helsinki. Knowing that pupils' needs and classroom management may awaken student teachers' expectations to take action in their future job, discussing these topics may support higher degrees of engagement, namely partnership or leadership (Ashwin & McVitty, 2015). However, the education contexts are different, and thus the comparison is not straightforward.

The Finnish students experienced the moments with their mentor teacher as the most engaging of the various interaction situations, followed by the sessions spent with the university lecturer. In those situations, the students and mentors or lecturers typically analyzed or solved challenging situations in the individual student's teaching practice. In Johannesburg, these interactions with mentor and lecturer were also experienced as engaging. These findings reflect what Kahu (2013) defined as psychosocial antecedents of engagement: university staff, teaching and support. The mentoring sessions are often tailored to the needs of the student teacher, and the mentors and lecturers take students' skills into account. Devos (2010) found this important because graduating teachers display different abilities and failing to acknowledge these may cause frustration among those students who are ready to face a challenge. Participating in mentoring sessions that are adjusted according to one's needs and the possibility of getting support may promote the emotional component of engagement (Fredricks et al., 2004). A mentor can also support the teacher students in setting realistic goals and fostering their positive self-beliefs, which is important from the perspective of cognitive engagement (Ravindran et al., 2005). Sessions with the mentor teacher happen multiple times a day, and the reflection taking place during those sessions can involve strong emotions, which may explain the students' experiences of high levels of engagement. Several researchers have emphasized the importance of integrating theory and practice during teaching practice and the challenges in this integration (Allen & Wright, 2014). Darling-Hammond (2017) suggested that theory and practice could be integrated, for example, through mentor teacher supervision, which helps student teachers integrate theory and practice. The mentor teachers are more than just 'experienced teachers'; they know the relevant research outcomes related to learning from practice and the phenomena happening in a classroom.

In Johannesburg, the students found the interactions in groups and in pairs more engaging than those with a mentor or lecturer. Working in a peer group with a shared task is an intense form of social interaction that supports the fulfillment of students' basic needs (Ryan & Deci, 2002). Students in Helsinki most frequently worked in pairs, which they also experienced as engaging. That is a positive aspect because the student teachers are supposed to plan lessons together in pairs and present together in all 50 lessons they teach. In Helsinki, the lessons when a university lecturer is present may be considered special and important because of their rarity. The feeling of importance, however, is unrelated to the grading of the teaching practice in Finland, because the teaching practice is graded 'completed' or 'to-be-completed', although very seldom the latter.

The most common activities—planning a lesson, teaching a lesson and reflecting on lesson—were among the most engaging situations in both Helsinki and Johannesburg. In all those activities, students frequently met with challenges for which their skills were appropriate, and they considered the activities interesting. Notably, the students

considered planning and reflecting almost as engaging as teaching a lesson. The students in our sample found interaction with the mentor engaging; this engagement may be partially the result of emotional engagement related to the supervisor's support in a challenging situation, but it may also be partially cognitive engagement related to the students' critical reflection on their teaching and planning activities. Carini et al. (2006) found a connection between students' engagement and their critical thinking skills, and Ravindran et al. (2005) suggested that epistemological sophistication is necessary to develop one's critical thinking. They stated that 'if students believe that knowledge is simple and certain, they have little reason to engage in critical reflection' (p. 230). They also claimed that instructors have a role in promoting student teachers' critical reflection and cognitive engagement. It might even be useful to increase the proportion of cognitive engagement in the supervision sessions because a teacher's profession sets high demands on critical thinking and that aspect should be strongly supported.

When planning and teaching, students can influence the formulation of these activities, transform existing objects of engagement and create new ones, and they can experience partnership or even leadership, which they categorized as higher degrees of engagement (Ashwin & McVitty, 2015). Engagement and its consequences take place in a reciprocal loop: engagement improves the quality of student teachers' actions and managing the teaching activities well promotes further engagement. Through concrete actions, the course requirements can be converted into a more engaged stance. According to Çakir data, the students first experienced blogging as a class requirement, but as the activity continued, they began to consider it a method of sharing and comparing knowledge with their peers. Concrete activities support engagement by supporting the behavioral component of engagement (Fredricks et al., 2004). In Johannesburg, the student teachers taught fewer lessons than those in Helsinki, and the most frequent activity in Johannesburg was 'following a lesson', which was also considered engaging. However, the opposite was true in Finland: students were required to follow a lesson infrequently, and it was not considered at all engaging. Therefore, it would be interesting to know what makes lesson following more engaging in Johannesburg. The most engaging activity in both universities was 'teaching a lesson'. What happens in teaching is the crystallization of everything the student teachers have learnt and adopted in their studies to date, and it is where the student teachers implement their theoretical ideas. Additionally, the intensity of the teaching situation and the dynamic environment where teaching takes place increase challenges. When observing, the student teacher is an outsider, but when teaching, they are the focus of the action, leading the situation and making the decisions. This notion emphasizes the role of participation, responsibility and autonomy in engagement. The engagement in the observation situation is fostered in the Helsinki teaching practice by offering the students a structure for observing, providing a theoretical lens through which they observe, and including the observation experiences in the follow-up group sessions. These activities also strengthen the students' views of the connection between educational theory and actual teaching.

The Johannesburg students found situations involving SMK related to subjects other than arts more engaging than the Helsinki students. The Helsinki students always have one art-related subject in their programme, and this may be the reason they reported using art-related SMK far more often in their teaching practice than Johannesburg students.

Preparing the lessons in these subjects is time-consuming, as the students need to practice the skills of playing piano or a certain art or handicraft technique. Experiencing these concrete activities as engaging may relate to the behavioral aspects of engagement (Fredricks et al., 2004). Students in both contexts spent a lot of time using SMK related to mathematics. The small number of home-language-related situations and low engagement percentages related to the home language in the Helsinki teaching practice are probably because in the teaching practice that constituted the context of this study, the student teachers did not teach the home language (Finnish). The Finnish language was only implicitly involved in the student teachers' planning and teaching.

With respect to PCK, planning according to curriculum was also among the most engaging domains of knowledge in Johannesburg and Helsinki. Both teaching practices emphasize the role of curriculum as a starting point for the planning activities. The Finnish curriculum (FNCCBE, 2014), however, is quite open and gives the user some freedom of implementation. This autonomy in implementing the curriculum, which relates to higher degrees of engagement, partnership and leadership, may explain why Finnish students experience engagement when planning lessons according to the curriculum, as the student teachers are expected to construct their sequence and lesson plans based on what they extract from the curriculum (Ashwin & McVitty, 2015). Motivational aspects and instruction methods were also engaging for the students in Johannesburg. Topics related to GPK, such as classroom management, were among the most engaging in Helsinki and among the second most engaging in Johannesburg. These findings are in line with what Rodman (2010) found in the United States when she asked about pre-service teachers' field-based experiences. In her study, pre-service teachers' reflections focused on learner characteristics, classroom management and teaching strategies (Rodman, 2010).

The findings showed that mentor teachers, fellow students, textbooks and course books were the most engaging sources of knowledge in both Helsinki and Johannesburg. Besides emotional support, the mentor teacher passes on important practice-related knowledge that is not necessarily included in the curricula of teacher education programmes. Therefore, being engaged in these situations can also be interpreted from the viewpoint of support to the cognitive aspect of engagement (Fredricks et al., 2004). Mentors or teacher educators should be trained with high-quality teacher trainer education programmes so that they are able to support the development of the professional identity of student teachers. This kind of research-based learning has the potential to support students as intellectual producers through their active engagement with research (Lambert, 2009). Regarding course books, if one assumes that students go back to their course material when planning their teaching in the teaching practice, they can connect the content of their university studies with their planning, teaching and reflecting.

In summary, working together with peer students is experienced as engaging in both contexts. If attention is devoted to the organization of teaching practice settings, the students' learning may be enriched by the power of collaboration, and they learn important skills from the point of view of their future profession. Furthermore, in both contexts teaching is experienced as engaging. It is important to organize possibilities for student teachers to experience teaching, not just observe it or talk about it. Teaching must be accompanied with reflection to ensure student teachers' development as professionals.

Biesta and Burbules (2003) cite Dewey as they argue that reflection converts actions into intelligent actions. Reflection must be supported, and that happens in the interaction between student teachers and their educated mentors. Students in our sample found the mentoring session engaging despite the context.

Conclusions

This study examined situations in which our participating student teachers experienced engagement. The results emphasize the significance of personal interaction with mentors and university lecturers in supporting the emotional and cognitive aspects of engagement (Fredricks et al., 2004). The student teachers found teaching, planning and reflecting on their lessons more engaging than other activities or informal discussions. Teaching, planning and reflecting on activities may also support students' higher levels of engagement, partnership and leadership (Ashwin & McVitty, 2015). According to flow theory (Csikszentmihalyi, 1990), to be engaged in a teaching practice situation, a student should experience situational interest, a challenge in the task and a skill or competence to undertake the task (Csikszentmihalyi, 2014). The findings suggest that the students experienced these in teaching, planning and reflection activities, as these activities challenged and triggered the students' interest. Students at both universities experienced similar amounts of SMK, PCK and GPK and found employing knowledge of these categories engaging. This finding indicates support for the cognitive aspect of engagement and interest (Fredricks et al., 2004). To sum up, the features of teaching practice support different aspects and degrees of student engagement.

Implications for theory, research and practice

This research contributed to the knowledge about student engagement in teaching practice in university-affiliated teacher training schools as it identified the most engaging moments during the teaching practice. From a research methodology perspective, this research offers knowledge about employing ESM in the context of teaching practice. In its present form, the ESM questionnaire includes multiple choice questions for easy self-report data collection. Information about the content and context is also collected but interviews could also be used to collect more profound information about content and context issues, as well as more deep data about why different practices are relevant from the point of view of engagement.

According to Kahu and Nelson (2018), engagement promotes achievement and thus improves self-beliefs and, subsequently, well-being. Recognizing situations that support engagement might indirectly support student teachers' adherence in their teacher studies and reduce dropping out. Furthermore, studying in an engaging environment offers student teachers a model of how they can organize the learning environment once they enter work life and subsequently support their students' engagement. Organizing such learning environments that support the learning of professional knowledge is crucial, because as Aarts et al. (2020) suggest, it is common for induction-phase teachers to struggle with various aspects related to teacher knowledge. Further, Dicke et al. (2015) argue that 'all domains of educational knowledge (i.e., knowledge of assessment, knowledge of learning

and development, knowledge of instruction, and knowledge of educational theory) had a negative and thus buffering effect on the increase of emotional exhaustion' (p. 70).

Teaching practice is a place where student teachers learn from practice, and are offered the opportunity to employ the knowledge they have gathered during their studies in an authentic setting. This research shows that teaching and mentoring sessions are especially engaging for student teachers. It is important to organize teaching practice in teacher training schools, where educated mentors can scaffold the students' reflection process, support the students in combining theoretical and practical perspectives of the teaching profession and guide students to seek information from various knowledge sources, which is the case in both Helsinki and Johannesburg university teacher training schools. Stokking et al. (2003) argue, based on their research, that adequate and sufficiently intensive mentoring, and a proper degree of independence and responsibility during an intensive practice period decreased the student dropout rate. If there is not a possibility to organize teaching practice in a university-affiliated teacher training school, the training of mentor teachers can still be emphasized, so that their view of teaching and learning is coherent with the aims of teacher training programmes and they are able to support student teachers' learning from practice. Student teachers come to teaching practice with their possible previous teaching experiences, and these experiences influence their beliefs about teaching and learning. In the teaching practice, student teachers reflect and elaborate their beliefs together with the mentor teacher and revise them to ensure professional actions and decision making.

Knowledge about engaging learning moments can be expanded outside teaching practice to cover the whole of teacher education and serve as material for teacher educators' professional learning. Ping et al. (2021) argues that teacher educators prefer to learn through formal and informal collaborative activities. Further, collaborative and individual reflections on teaching are recognized as supportive for teacher educators' professional learning. Contextuality in the form of 'real-life' problem solving situations is important, as understanding the context-specific nature of professional knowledge is seen as a prerequisite for professional learning (Rasku-Puttonen et al., 2004; Renkla, 2001). It is useful to take teacher educators' research orientation into account when designing activities that support their professional learning, for example by utilizing the knowledge gathered from the real teacher training school context and by promoting collaboration between teacher educators and schools (Cao et al., 2021; Diery et al., 2020).

Limitations of the study

The study has several limitations. The student samples were convenience type, and the results could not be fully generalized. However, there are aspects that were similar independent of the context.

Furthermore, students may have been involved with multiple activities at the same time, and they may report these in one response. It is not possible to know which practice has influenced most to the reported level of engagement. Data were collected using smartphones in the middle of other activities. Consequently, the collection process itself may have disrupted students' engagement, or there may have been a delay in the response as the questionnaire did not close after it was sent. The ESM questionnaire remained consistent throughout the data collection and students became familiar with it.

Statements

In this research, ethical standards were followed in the conduct of the study. Permission for the data collection was acquired from the school administrative principal. The data collection activities did not cause any risk to the students, and they were voluntary. Students had the possibility to withdraw at any time. Consent to use the data that originated from these activities was obtained. The students were told that the data would be anonymised before analysis. The students were also informed that the data was treated confidentially and kept in a safe place in the university. Possibilities for secondary analysis of the data can be negotiated with the authors. The authors do not have any interests that might be interpreted as influencing the research. The research is in line with the European Code of Conduct for Research Integrity of All European Academies and follows the general ethical guidelines of scientific studies set by the Finnish Advisory Board of Research Integrity. No specific evaluation at the Faculty of Educational Sciences is needed for the type of research, introduced in the manuscript.

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