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Student teachers' learning-to-teach patterns: connecting teaching approaches, teacher intentions, and self-perceived instructional impact

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ABSTRACT

This study introduces a comprehensive learning-to-teach (LTT) framework that incorporates three previously unconnected domains: teaching approaches, teacher intentions, and self-perceived instructional impact. The framework is used in research that was conducted in a Finnish comprehensive school setting involving 45 student teachers (STs) during their practicum. STs' critical teaching incidents and stimulated recall interviews ($f = 90$) were analyzed through the three LTT domains. The results revealed four key LTT patterns: effective curriculum portrayal through direct teaching approaches, difficulties in student behavior management with one-way teaching approaches, and mixed outcomes in student participation and personal needs accommodation through multi-way direct teaching approach. The study offers insights into diverse LTT patterns. It underscores that STs demonstrate potential in employing interactive direct teaching approach, whereas greater emphasis should be placed on classroom management when using constructivist teaching approaches. The LTT framework is suggested as a promising tool to enhance STs' learning to teach.

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1. Introduction

During teacher education, student teachers (STs) should acquire various competencies – that is, knowledge bases and skills – that are required to perform practical teaching work in schools (Ball & Forzani, 2009). Yet teacher education programs have been criticized for their too abstract content and inadequacies in preparing STs to deal with everyday practical situations in teaching (Loughran, 2019). Moreover, it is increasingly highlighted that the most important source of teachers' learning is their first hand teaching experience although it is insufficiently analyzed in the pre-service teaching context (Goldhaber et al., 2022).

Recent developments in research on teacher education have also suggested that in addition to being trained in specific teaching skills, STs should learn to analyze the relationship between teacher actions and student learning (Hiebert et al., 2007; Yeh & Santagata, 2015). The deliberate analysis of teaching may help STs to better establish thoughtful patterns of action in their classrooms; this can, in turn, lead to the development of effective teaching practices through cumulated in-service

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teaching experience. However, the deliberate analysis of teaching has not been explicitly integrated with other teacher knowledge domains that are critical to STs' learning, and thus, we aim to fill this gap.

Based on a close reading and analysis of the teacher education literature, we conceptualize a specific learning-to-teach (LTT) framework in this study, which comprises three LTT domains: teaching approaches, teacher intentions, and self-perceived instructional impact. These three separate but interconnected LTT domains can be recognized in previous research (e.g., Hiebert et al., 2007; Kennedy, 2016; Pitkäniemi, 2009); however, the interrelationships of the three complementary domains have not been examined in tandem. We consequently lack a clear view of the different teaching approaches in STs' practices, how STs' teaching approaches link with critical teacher intentions, and the kind of impacts that STs perceive in the teaching approaches they reflect upon. By bringing the LTT domains together, teacher educators can better assist STs in both the development of their classroom practices and the enrichment of the educational objectives and concerns underlying these practices.

The purpose of this study is to elaborate the theoretical framework of LTT and apply it in the qualitative exploration STs' practicum experiences. We first reconceptualize the LTT framework by defining the three LTT domains and their conceptual relationships. We then employ the three domains in the analysis of critical teaching incidents elicited during Finnish STs' practicum experiences. The qualitative patterns based on these three LTT domains are then described and discussed.

2. Theoretical framework

We link the three domains and their significance in LTT as follows: First, teaching approaches refer to the teachers' practical arrangements of students' study activities in classrooms and thus are at the heart of didactic organization in teacher's work (cf., Pitkäniemi, 2009). Thus, they work as a starting point for analyzing STs' LTT. Second, teacher intentions comprise the various objectives and concerns that underlie teaching approaches. As teaching approaches can be seen as tools that teachers use to accomplish specific purposes in the classroom, they should be connected with ST's teacher intentions. Third, self-perceived instructional impact means teacher's own observations and interpretations of the outcomes of teaching approaches, e.g., how effectively a teaching approach promoted student learning. STs' own appraisals of their instructional impacts prepares STs to adapt and modify their teaching approaches in their particular classroom contexts.

2.1. Teaching approaches

According to Fenstermacher and Soltis (2009), teaching approaches form a unique key aspect of teachers' work and teaching competence. By enacting different teaching approaches, teachers deal with curricular substance to advance their students' learning (Fenstermacher & Soltis, 2009; Gage, 2009; Sato, 2014). Teaching approaches are teachers' relatively comprehensive ways to organize students' study activities in a given situation. Thus, they can include several individual tasks, teaching techniques and activities (Tiilikainen et al., 2019a). Due to their essential role in teachers' everyday work, teaching approaches are also central to STs' learning. Still, teaching approaches are explored to a surprisingly limited extent in STs' practice. Researchers have referred to teaching approaches using a variety of terms, such as instructional practices and strategies (Lam & Kember, 2006), teaching methods (Struyven et al., 2010), teacher beliefs (Fives et al., 2015), and teaching models (Pitkäniemi, 2009). This conceptual variety partly reflects the broader issue concerning the relationship between teacher action and teacher thinking (Clark & Peterson, 1986; Gitomer & Zisk, 2015; Good & Lavigne, 2018).

Based on some conceptualizations (e.g., Fenstermacher & Soltis, 2009; Prosser & Trigwell, 2014), teaching approaches include both teacher thoughts and classroom practices, whereas other models (e.g., Gage, 2009; Pitkäniemi, 2009) refer primarily to teachers' observable actions (cf., Clark &

Peterson, 1986). In this study, we suggest the conceptualization of teaching approaches solely in terms of observable teaching activities, while the two other LTT domains are allocated to capture teachers thinking. This distinction helps us to avoid the conceptual confusion between teacher action and teacher thinking and then connect them.

Previous research has often dealt with teaching approaches in terms of the dichotomy between student-centered or constructivist approaches on the one hand and teacher-centered or transmissionist approaches on the other (Fives et al., 2015). Several studies have utilized the divide between teacher-focused and student-focused teaching approaches to analyze teaching in higher education contexts (Prosser & Trigwell, 2014), although this conceptualization of teaching approaches has recently been challenged as being too dichotomous (Cao et al., 2019). The challenges regarding the dichotomous split have also been recognized in research on school teaching (Fives et al., 2015). First, the definition of teaching approaches has been unclear and has often failed to differentiate between learning principles and specific teaching approaches. Additionally, the complexities and flexible combinations of teaching approaches (Darling-Hammond, 2008; Goodwin, 2013) have not been sufficiently explored.

To respond to the need for a more dynamic classification of teaching approaches, we divide them not only into two main categories, but also into their combinations. We conceptualize the two main teaching approaches as direct and constructivist (cf. Gage, 2009; Good & Lavigne, 2018; see also Sato, 2014). We then modify and apply Pitkäniemi's (2009) conception of the one-way and multi-way variants of teaching approaches, adding intermediate (multi-way) approaches that are combinations of the main (one-way) approaches. In *one-way direct teaching*, the teacher strongly regulates the classroom activities and guides the students' attention. In *multi-way direct teaching*, the teacher plays a leading role in regulating the classroom activities but does so in clearly interactive ways that enable student participation to be highlighted. *One-way constructivist teaching* signifies the opposite approach to one-way direct teaching; here, students are highly responsible for progressing their learning activities either individually or cooperatively. Finally, compared to multi-way direct teaching, *multi-way constructivist teaching* expresses interactive elements in the opposite direction: student-regulated learning activities work as a starting point, but this is followed by clear teacher intervention that alters the course of classroom activities.

2.2. Teacher intentions

The second domain in our LTT framework is teacher intentions. Teacher intentions refer to the different educational purposes and goals embedded in teachers' practice (Kennedy, 2005, 2016) and, in our framework, in the enactment of teaching approaches. Teacher intentions signify that observable practice is not sufficient to capture the skills needed in LTT but that teaching practices can only be properly understood with reference to the goals that a teacher attempts to achieve through them. This is in line with the recent teacher education literature that emphasizes the need to explore teacher thinking in the context of teaching practice (Ball & Forzani, 2009) and attempts to map out the instructional core practices (Grossman, 2018) that penetrate teachers' work.

We suggest that the definitions of core practices often include both the activity and the intention behind it, whereas teacher intentions refer to core practice minus the activity. Take an enthusiastic teacher presentation, for example. We could refer to the whole incident by saying that the teacher is motivating her students (core practice: both the activity and the intention included). Or, we could say that the teacher is using a presentation method to motivate her students (activity and intention distinguished). Now, if we leave the activity out from the latter description altogether, we have a specific teacher intention left (i.e., motivating the students in this second sense). In our LTT framework, we first distinguish between the teaching activity and teacher thinking to later interconnect them; thus, the concept of teacher intentions better suits our analysis.

Teacher intentions are part of the pedagogical reasoning that, according to Loughran (2019), forms the foundations of teachers' professional knowledge. Pedagogical reasoning enables teachers

to not only plan their classroom actions purposefully but to also elaborate on their accumulating teaching experience and learn from it effectively (Loughran, 2019). Teacher intentions help teachers to ground their choices (e.g., selecting a proper teaching approach) in the requirements of teaching situations (e.g., paying attention to students' needs). Through the explication and development of teacher intentions, STs can be guided to use teaching approaches in reasoned and purposeful ways (Kennedy, 2016). While the different teaching approaches can each be seen to have particular educational potential, it is the teacher intentions that help to actualize this potential in each given case (Tiilikainen et al., 2019b).

Kennedy (2005) has paid attention to two interesting features of teacher intentions. First, teachers' intentions may differ from those of school reformers. When developing teachers' teaching approaches, teacher educators and school reformers should be aware of the intentions that the teachers themselves have in regard to their teaching approaches (e.g., maintaining a proper activity flow in the classroom). Second, while the complexity of teaching is likely to trigger a range of intentions in teachers' actions, the different intentions may conflict with each other (e.g., increasing student motivation could add unwanted classroom management concerns) (Kennedy, 2005). This implies that STs should learn to balance their teaching approaches so that a proper relative weight can be given to each intention (Kennedy, 2016).

Kennedy (2016) has recognized five teacher intentions that are embedded in teachers' practice: portraying the curriculum, enlisting student participation, exposing student thinking, containing student behavior, and accommodating both students' and teacher's personal needs. Apart from the works of Kennedy (2005, 2016) in the context of in-service teaching, studies examining teacher intentions have remained scarce. Moreover, studies employing the pivotal framework of Kennedy to examine STs' teacher intentions are lacking.

2.3. Self-perceived instructional impact

The third domain in our LTT framework is self-perceived instructional impact. A topical issue in research on learning and instruction has been the detection of the teaching approaches that have the greatest impact on student learning (Hattie, 2007; Kirschner et al., 2006; Tobias & Duffy, 2009). Accordingly, during their initial teacher preparation, STs should be guided to engage in effective teaching behaviors (de Vries et al., 2015). However, the philosophy of teaching influence highlights the dilemmatic nature of teaching outcomes: A causal relation between teaching and learning exists, but it is always mediated through student response and is open in this sense (Biesta, 2013; Kivelä & Siljander, 2013). Teaching does not necessarily lead to student learning.

Several authors also highlight that instructional design research does not yield definitive solutions for teachers to adopt but, rather, call for teachers' own decision-making (Good & Lavigne, 2018; Hattie, 2007). In this scenario, teachers should ultimately monitor and analyze their instructional impact. This enables the teachers themselves to establish valid theories of action that are suitable for their own classrooms (City et al., 2009; Hiebert et al., 2007; Sun & van Es, 2015).

Hiebert et al. (2007) constructed a conceptual framework that aimed to cultivate LTT by guiding the STs to analyze the causal relationships between teacher action and student learning in real-life classroom settings. The model suggests that STs' perception of instructional impact comprises the anticipation, enactment, appraisal, and improvement of the instructional impact. In this study, we draw on a more overall and self-perceived instructional impact that refers to STs' experiences in advancing their particular teaching intentions through different teaching approaches. Our notion of the self-perceived instructional impact covers all the stages suggested by Hiebert et al. (2007), but it mostly concerns observing and appraising the impact of a teaching approach. While advancing improvements in teaching, it is important to focus on the perceived impacts on the instructional core that captures the essential parties of teaching (Allas et al., 2020; Chazan et al., 2016; City et al., 2009; Männikkö & Husu, 2018; Stenberg et al., 2014). The instructional core as implemented in this study is presented in Figure 1 below.

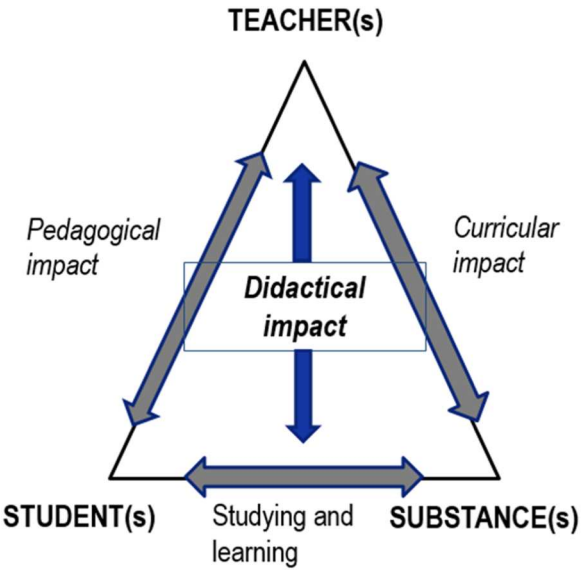

Figure 1. Self-perceived instructional impact within the instructional core (the instructional core, see e.g., Allas et al., 2020).

First, the instructional impact can take place in the social interaction between the students and the teacher (*pedagogical impact*). Second, the impact can also situate in the relationship between the teacher and the curricular substance of the teaching (*curricular impact*). Third, the instructional impact can meld the previous two impacts by taking place between the teacher's teaching activities and the students' learning (*didactical impact*). Figuring out the positioning of the instructional impact vis-à-vis that of the instructional core is helpful when making appropriate adjustments to teaching approaches.

3. Research aim and questions

To explore the qualities of STs' LTT patterns, the empirical part of this study explores critical incident data elicited from the STs' practicum experiences, a vital phase in pre-service teacher education. The following two research questions were set to guide the empirical investigation:

(RQ1) How are the three LTT domains (i.e., teaching approaches, teacher intentions, and self-perceived instructional impacts) embedded in STs' reflections during their teaching practice?

(RQ2) What kind of LTT patterns are emphasized in STs' reflections on their teaching practice, that is, how are the three LTT domains interlinked?

Answering these questions can glean insights to enhance teacher education programs, especially in their practice-based contexts, and better equip STs for their forthcoming teacher roles. Identifying teaching patterns of the four major LTT domains illuminates what kind of teaching strategies STs demonstrate most potential, as well as where STs need more assistance from teacher educators.

4. Methods

4.1. The research context

The study was conducted in a Finnish comprehensive school context. In Finland, teachers are granted broad professional freedom in their teaching; this is intended to empower teachers to make autonomous and reflective judgments regarding their school teaching (Tirri, 2014). The

Finnish teacher education system is exceptional by international comparison: Teacher education takes place in university-based programs so that teachers who work at the primary level and above graduate with master's degrees. The aim of this academic education is to equip teachers with research skills and a reflective orientation, both of which are seen to contribute to their pedagogical reasoning (Tirri, 2014).

The STs carried out their practicums at a research-intensive university-based teacher training school, and the aim was to connect teaching practice with theoretical studies. During the study, the more common reflective practices, such as collaborative planning, post-lesson feedback, and portfolio writing, were enhanced using the oral reflection part of the procedure of guided reflection (Allas et al., 2017, 2020; Husu et al., 2008, see Appendix 1). The aim of the guided reflection procedure is to support STs' construction of teachers' practical knowledge by increasing the reflective focus with carefully delineated critical incidents. The procedure involved the use of critical videoed critical incidents selected by the STs from their lesson as the basis for reflection (Husu et al., 2008). The recorded critical incidents were then reflected on with supervisors and/or peers with the help of a thematic discussion template (Appendix 2).

4.2. Data elicitation

The qualitative data consisted of 45 STs' critical incidents ($f = 90$) that were videoed and selected during the STs' teaching practicums, as well as stimulated recall (STR) interviews (Calderhead, 1981) related to the critical incidents. The STs were Finnish pre-service primary school teachers ($n = 41$) and pre-service subject teachers ($n = 4$). Some pre-service class teachers were minoring in subject studies, and all the participating pre-service subject teachers were minoring in primary school teacher studies. The STs were carrying out their studies in different phases (bachelor's and master's programs) and in the contexts of their specific practicum curricula.

The first and last author organized a conference, where the STs were informed about the present research. The STs' participation was voluntary; they could contact the researchers if they were willing to participate in the project as a part of their practicum and professional learning. Similarly, conferences were organized for the supervising teachers, where they were informed about the project. The participated STs gave their informed consent.

For the video recording, the participating STs were instructed to choose a lesson that coincides with their own learning goals as teachers. Thereafter, the STs were asked to select two incidents – one empowering and one challenging – from the videoed lessons. The critical incidents were then reflected on with supervisors and/or peers in STR interviews. Most of the supervisors were school-based mentor teachers and some supervisors were faculty members. Supervisors' role was to lead the discussions and help STs to notice important aspects in recorded critical incidents. Some STs proceeded relatively independently in their reflection, whereas in some discussions supervisor's role was more emphasized. The participants followed a thematic discussion template consisting of opening questions that guided participants' reflection (Appendix 2). The guiding questions focused on STs' and students' actions during the critical incident, and especially on causal relations between them. STs were guided to provide explanations and reasons for their actions. The participants could follow the discussion template in rather flexible ways, for example by asking follow-ups and providing additional viewpoints.

4.3. Data analysis

We used holistic units of analysis (Miles et al., 2014) that do not split the data into small sequences. This allowed us to create an overall picture of the data (Miles et al., 2014). The holistic units were as follows. To identify the STs' teaching approaches, we handled each critical incident ($f = 90$) as a single unit of analysis. To recognize the STs' teacher intentions and self-perceived instructional impact, we interpreted each transcribed STR interview ($f = 90$) as a whole.

The holistic units enabled us to apply multidimensional simultaneous coding (Saldaña, 2009), where a same unit could be categorized from multiple perspectives while preserving mutually exclusive codes (i.e., as the codes represented different dimensions, they did not overlap). Thereby, each of the 90 critical incidents was categorized from the three viewpoints presented in the LTT framework: teaching approach, teacher intention, and self-perceived instructional impact (see Table 1). In our holistic coding, only one code per each LTT-dimension (teaching approach, teacher intention, self-perceived instructional impact) was assigned to each critical incident and associated STR-interview (Table 1).

The coding was conducted using abductive content analysis (Timmermans & Tavory, 2012), so that theory-driven coding categories were adopted, but the categories were modified when needed to fit the data. The coding was based on the transcribed STR interviews, and the lesson videos were also consulted to identify STs' teaching approaches. Following the logic of our LTT framework and the research questions, the coding proceeded in two major stages. We first categorized the individual LTT domains and then explored the comprehensive LTT patterns by linking the LTT domains together.

In the coding of the LTT domains, we first applied our classification of one and two way direct and constructivist teaching (see also Pitkäniemi, 2009) to the critical incidents. This enabled us to identify STs' teaching approaches.

Table 1. Examples of data analysis (adapted and edited from original coding sheet in Microsoft Excel).

Critical incident (student teacher)	Summary of the critical incident	1 Teaching approach	2 Teacher intention	3 a Instructional impact (Perception: Effective / Ineffective)	3 b Instructional impact (Instructional Core Relation)	4 LTT Pattern
ST1	Some students in the small-group are not working but are misorienting and talking about irrelevant topics regardless of STs' instructions.	Constructivist (1-way)	Containing student behavior	Ineffective	Pedagogical	Struggling to organize social learning
ST3	ST provides an answer and explanation to one student and as a result another student also gains insight.	Direct (2-way)	Portraying curriculum	Effective	Didactical	Promoting and sharing student insight
ST3	ST does not manage to look after and help an attention-seeking student during independent seat-work.	Direct (2-way)	Accommodating personal needs (student)	Ineffective	Pedagogical	Compromising care
ST43	ST succeeds to engage students by questioning, giving enough wait time, and involving them to blackboard writing.	Direct (2-way)	Enlisting student participation	Effective	Didactical	Getting students engaged in instructional discussion

Kennedy's (2016) model was modified and applied to the STR data to recognize STs' teacher intentions. Kennedy's (2016) model was modified to fit in our data so that *portraying curriculum* and *exposing student thinking* were integrated into a single coding category. This was because we interpreted *exposing student thinking* to be a part of the larger category of *portraying curriculum*; *exposing student thinking* did not warrant its own separate category based on our data.

Self-perceived instructional impacts were assessed based on STR data. We first coded self-perceived instructional impact into effective and ineffective categories based on the STs' general appraisal of their success in the incident. Second, we specified self-perceived instructional impact by coding it according to the instructional core (*pedagogical, didactical* and *curricular* impact).

Next, we used data quantification and summary matrices to relate teaching approaches, intentions, and perceived impacts with each other (Miles et al., 2014). With the help of the summary matrices, we analyzed what kind of LTT patterns were emphasized in the data – that is, what kind of teaching approaches were most frequently associated with particular teacher intentions and self-perceived instructional impacts. This phase yielded four key LTT patterns that are reported in the results.

Finally, we used data reduction (Miles et al., 2014) and continued working exclusively with the four key LTT patterns (60 critical incidents in this stage). The four main LTT patterns were grouped based on combinations of LTT domains they represented, and as for instructional impact, both effectiveness and positioning on the instructional core were considered. More data-driven categories were constructed within each four LTT pattern, thus characterizing the critical qualities of the LTT patterns in more detail.

Working within interpretive research and with experiential ("soft") data aiming at theory construction, the verification strategies of saturation, methodological cohesion, and theoretical coherence were used (Morse, 2018). The data and coding template were shared between the authors to discuss the analytical choices. While the first author performed the coding, the coding categories were discussed within the author team (cf. Saldaña, 2009). In addition, the theoretical coherence of the category system was considered.

5. Results

5.1. LTT domains in STs' teaching practice

We begin by describing how the individual LTT domains were represented in STs' critical incidents. These results are summarized in Table 2. Next, each LTT domain (teaching approaches, teacher intentions, and self-perceived instructional impact) is addressed in turn.

5.1.1. Teaching approaches used in STs' teaching practice

Direct teaching approaches were emphasized in STs' critical incidents. In fact, as Table 2 shows, the one – and multi-way variants of direct teaching covered more than two-thirds of the critical incidents. The STs' most commonly reflected teaching approach was *multi-way direct teaching* (43%). Consequently, the STs tended to adopt a rather active teacher role in orienting students' attention and learning, but they did this in interactive ways. Typical examples of multi-way direct teaching were instructional discussions and questioning methods. The multi-way direct teaching also included guiding students' seatwork, during which the students practiced a skill after the STs' provided a demonstration and instructions. In *one-way direct teaching* (34% of the incidents), there was greater emphasis on the elements of explicit instruction, such as presentations and demonstrations. Typical cases included presentations and demonstrations by the STs. These one-way direct teaching incidents often occurred when the STs instructed the students regarding their tasks.

Constructivist teaching approaches – both the one – and multi-way variants – were represented in about a quarter of the STs' critical incidents (23%). *One-way constructivist teaching* (17%) included the facilitation of students' work in collaborative small groups. In these incidents, the

Table 2. The manifestation of the LTT in STs' critical teaching incidents (90 in total).

		Self-perceived instructional impact	
Teaching approach (f, %)	Teacher intention (f)	Effective (f)	Ineffective (f)
Direct teaching, one-way (teacher → students) 31/90 (34%)	Portraying the curriculum: 12	9	3
	Enlisting student participation: 4	1	3
	Containing student behavior: 13	4	9
	Accommodating personal needs: 2	0	2
Direct teaching, multi-way (teacher ↔ students) 39/90 (43%)	Portraying the curriculum: 16	13	3
	Enlisting student participation: 12	7	5
	Containing student behavior: 4	1	3
	Accommodating personal needs: 7	5	2
Constructivist teaching, one-way (students → students) 15/90 (17%)	Portraying the curriculum: 1	0	1
	Enlisting student participation: 2	1	1
	Containing student behavior: 11	1	10
	Accommodating personal needs: 1	0	1
Constructivist teaching, multi-way (students ↔ teacher) 5/90 (6%)	Portraying the curriculum: 2	2	0
	Enlisting student participation: 1	1	0
	Containing student behavior: 2	0	2
	Accommodating personal needs: 0	0	0

students' responsibility for progressing the learning task was emphasized. Interestingly, multi-way *constructivist teaching* (6%) was the least represented approach. These incidents included STs' interventions in student-regulated tasks and scaffolding, such as just-in-time explanations in small groups. In addition, multi-way constructivist teaching was identified in a case in which an ST significantly changed his music lesson plan based on student initiative. When one student asked if the class could try playing the trumpet, the ST circulated the trumpet so that the students could try playing it.

5.1.2. Teacher intentions in STs' teaching practice

Teacher intentions referred to different educational concerns and purposes when STs reflected on their critical incidents. *Portraying the curriculum* was the most expressed teacher intention (34%). This teacher intention was mostly concerned with student learning. Typically, with regard to this intention, the STs strongly reflected student learning in relation to their own attempts at teaching.

Containing student behavior was also a frequently expressed teacher intention (33%). This teacher intention dealt with the different classroom management concerns that emerged during STs' teaching. The intention to contain appropriate student behavior included attempts to get students' attention and to do so throughout the teaching activity.

Enlisting student participation as a teacher intention was expressed in about one-fifth of the critical incidents (21%). In these cases, the STs were most concerned about student motivation, as well as their own role in ensuring that the students were engaged with the tasks. The intention to enlist student participation focused on both the engagement of the whole group and on the motivation of individual students.

The least expressed teacher intention was *accommodating personal needs* (11%). This intention touched on the STs' concerns regarding well-being in the classroom in different ways; in most cases, the STs' intentions were to support their students' well-being, but in some cases, the STs also reflected on their own well-being as teachers.

5.1.3. Self-perceived instructional impact in STs' teaching practice

The third and final domain in LTT was STs' perception of the outcome of their teaching. The perceived impact was set as dichotomous: half of the incidents represented impacts that were perceived as effective, while the other half included incidents that were perceived as ineffective (Tables 2 and 3). To specify the nature of impacts that the STs perceived in their teaching practice, perceived impacts were situated on the three different relational aspects of the instructional core (Table 3).

As shown in Table 3, most of the instructional impacts perceived by the STs took place within pedagogical and didactical relations. The pedagogical impacts focused on the personal side of teaching, covering the social relationship between the teacher and the students. Some impacts were more closely related to the didactical encounters wherein the STs reflected on their organization of the teaching substance to advance their students' learning. Finally, only in some incidents did the perceived impact focus more exclusively on the relationship between the teacher and the content – that is, the teachers' vision of selecting and transforming the teaching substance itself. Even in these cases, however, the impact was discussed in rather close association with classroom interaction.

Interestingly, the majority of the pedagogical impacts were perceived as ineffective. This means that most of the challenges faced by the STs usually took place during their personal encounters with the students. The opposite trend was found in the perceived didactical impacts: The STs experienced mainly successful outcomes in regard to guiding students' learning of curricular substance.

5.2. LTT patterns in STs' teaching practice

Next, we describe what kind of LTT patterns ultimately emerged from the STs' teaching practice when the individual LTT domains (teaching approaches, teacher intentions, and self-perceived instructional impact) were linked with each other. Based on the frequencies showing the co-occurrences between the LTT domains in Table 2, four major LTT patterns emerged. These four LTT patterns and their critical qualities are shown in Table 4.

The four emphasized patterns positioned on didactical and pedagogical relations in the instructional core and were conceptualized accordingly (two didactical and two pedagogical patterns). In what follows, each LTT pattern is described and illustrated in turn.

5.2.1. Didactical pattern 1: effective portrayal of the curriculum through direct teaching

In this pattern, the STs reflected in various ways on how they succeeded in supporting their students' learning of curricular content. The pattern includes both one – and multi-way direct teaching approaches. In these cases, the STs perceived mostly effective impacts in supporting student learning (Table 4). This LTT pattern comprised three specific qualities: *instructing with clarity*, *promoting and sharing student insight*, and *framing and reviewing learning content* (Table 4).

A number of incidents included STs' perceptions of having succeeded in *instructing with clarity*. Typically through one-way direct teaching – that is, different kinds of teacher presentations – the STs managed to provide the students with tangible instructions regarding how to proceed in their learning. The following fragments illustrate an ST's success in portraying the curriculum through one-way direct teaching, with the resulting impact of instructing with clarity (the hyphens indicate parts in the transcript that have been omitted in the citation):

Table 3. The positioning of STs' self-perceived instructional impacts on the instructional core.

	Pedagogical impact	Didactical impact	Curricular impact	Total
Effective	14	29	2	45
Ineffective	29	14	2	45
TOTAL	43	43	4	90

Table 4. STs' LTT patterns and their critical qualities.

Didactical pattern 1: Effective portrayal of curriculum through direct teaching
- Instructing with clarity
- Promoting and sharing student insight
- Succeeding in framing and reviewing content

Pedagogical pattern 1: Ineffective containment of student behavior during one-way teaching
- Struggling to prepare students for a task
- Struggling to organize social learning

Didactical pattern 2: Mixed effects in enlisting student participation through multi-way direct teaching
- Getting students to engage in instructional discussion
- Struggling to get students to engage in instructional discussion

Pedagogical pattern 2: Mixed effects in accommodating personal needs through multi-way direct teaching
- Prioritizing care
- Compromising care

ST:	Okay. What's going on in the situation? What do I see and hear? Well, I selected this incident because I think I had projected clear and concise instructions with the document camera, and I'm also supporting the instructions with my speech. - - -
Supervisor:	Yeah, you should rhythm your speech clearly, as you are doing in the incident.
ST:	Yeah.
Supervisor:	It was already present in your instructions. It is clear, and each step is small enough. - - -
ST:	I think it matches well with what third-graders can manage. I mean they are receiving both verbal and written instructions. Sometimes we have only one of them. But we often have them both. Then you can just say "Look from there" (points toward the document camera).

The above example is related to the ST's use of teacher presentation to instruct on a task. The ST perceives that her presentation of the task was effective due to the combined use of verbal and written instructions. The supervising teacher agrees with this and forms a general principle from the ST's experience: The combined use of verbal and written instructions makes it possible to refer to the instructions later and ensure students' progress in the task.

The second critical quality in pattern 1 was *sharing and promoting student insight*. Typically through different kinds of interactive direct teaching arrangements (multi-way), the STs perceived that they succeeded in helping students to support their comprehension of the topic at hand. These incidents often went beyond ensuring students' understanding of what to do, extending toward deeper student interpretations of the learning topic. Even in the cases in which instructions were provided, highly interactive teaching elements were introduced; these included letting the students contribute to the instructions, followed by the STs summarizing the students' contributions. The most typical cases regarding the promotion of student insight covered successful instructional discussion and questioning episodes wherein teacher-led whole-group activities were enriched by student contributions, such as questions.

The third and least represented quality in LTT pattern 1 was *framing and reviewing learning content*. Whereas the preceding two qualities concerned directing students' ongoing learning tasks, this third quality focused on the very beginning and end of the teaching-learning process. One of the incidents concerned successful communication of the taken perspective in the history unit to the students (European perspective on historical innovations). Other incidents represented the opposite end of the teaching continuum: The STs experienced effective impacts in reviewing students' learning tasks and outcomes. These incidents could either finalize the perceived impact (reviewing the learning outcomes) or lead to the next teaching unit (reviewing the learning outcomes and then moving on to the framing of the next sequence).

5.2.2. Pedagogical pattern 1: ineffective containment of student behavior during one-way teaching

Containing student behavior mainly related to both forms of one-way teaching approaches (one-way direct teaching and one-way constructivist teaching). This means that the most teacher-directed and the student-directed approaches were likely to trigger classroom management concerns. Furthermore, in both of these cases, the STs perceived mostly ineffective impacts in regard to managing classrooms (Table 4). This LTT pattern embedded two typical impact qualities: *struggling to prepare students for a task* and *struggling to organize social learning* (Table 4).

Struggling to prepare students for a task took place during the initiation stage of the learning tasks. Here, the STs experienced challenges in getting their students' attention when instructing the task; this occurred most often in the context of one-way direct teaching. Whereas instructing with clarity (impact quality in the previous LTT pattern) mostly concerned the cognitive aspects of giving guidelines for a learning task, struggling to prepare students for a task entailed more affective drives and challenges. Here, creating classroom preconditions for successful learning activities in the first place was at stake.

The second impact quality within this pattern was *struggling to organize social learning*. These cases comprised highly social learning activities in the domain of one-way constructivist teaching. The individual or cooperative student responsibility was greatly highlighted in these activities, with the STs adopting a facilitating teacher role. In these incidents, the characteristic impact concerned not only getting students' initial attention but also maintaining it throughout the cooperative activity. The following excerpt illustrates an incident in which an ST struggles to organize a social small-group activity:

ST:	The students did say the points aloud, but none of them was willing to write them down. And then later, during the discussion, they were not consenting to tell the points. I just couldn't manage my small group. And then they began to tear the plastic bag. And just when the bag was about to explode (slaps her hands together), I got the bag away from them.
Peer ST:	Well, there …
ST:	I'm not sure … Maybe you didn't notice it?
Peer ST:	Well, I actually did …
ST:	And then they were shouting there, and I was saying, "Please, be quiet." But somehow, I got myself too much into the background, [and] I didn't have enough authority to tell them to stop.

In the passage above, one ST is describing her struggle with the lesson to her peer ST. The STs had divided their students into small groups that were examining different physical materials (such as plastics). The ST expresses feelings of vulnerability because she could not manage her small group and direct their schoolwork properly. The experienced exhaustion is explicit in the ST's reflection.

5.2.3. Didactical pattern 2: mixed effects in enlisting student participation through multi-way direct teaching

Enlisting student participation mostly related to multi-way direct teaching (Table 2). It was remarkable that pattern 3 included both effective and ineffective instructional impacts (Table 4). Two critical impact qualities entailing a similar mechanism emerged, but the difference was based on perceived efficacy: *getting students involved in instructional discussion* and *struggling to get the students to engage in instructional discussion* (Table 4).

The characteristic classroom mechanism in this LTT pattern clearly revolves around whole-class instructional discussions, and when perceived as effective, the impact quality manifested as *getting students involved in instructional discussions*. A major concern for the STs was the extent to which the students were participating in classroom dialogues. When the STs perceived effective impacts, they paid attention to the even division of participation among the students; their own expressions of enthusiasm; and physical expressions of student participation, such as showing answers with gestures. Some perceptions extended the focus to the quality of the interactive discourse – for example, the level of the questions, as well as the wait time provided during the discussion. The following

fragments illustrate one ST's success in enlisting student participation through multi-way direct teaching:

Supervisor:	Okay. What do you see yourself doing in the situation?
ST:	Well, I'm activating the students by using personalized questions. I'm trying to get the discussion started and the students activated. - - -
Supervisor:	Well … what do you see the students doing in the situation?
ST:	Well, my questions are easy enough so that they, in a way, force every student to participate in the discussion. And at some points, almost every student raised their hands. - - -
Supervisor:	Well … what kind of teacher role is the situation related to?
ST:	Well … I think … Well, it is clearly the teacher who is asking the questions and, in that way, leading the discussion. But, on the other hand, the students are participating intensively so that it is … well yeah. It is teacher-led discussion in the sense that the teacher is managing the situation, but at the same time, the students are active participants.
Supervisor:	Yeah.

In the above passages, the ST describes her intentions to awaken the students by asking them personally relevant questions. She thinks that the cognitive level of the questions was appropriate for engaging the students in instructional discussion. Supported by the supervising teacher's question, the ST analyzes the situation, opining that she was actively leading the action but doing so in a way that enabled the students to actively participate in the activity.

The second impact quality represented the opposite aspect of enlisting participation through interactive direct teaching – that is, *struggling to engage students in instructional discussion*. In these incidents, the STs perceived inadequate participation in the classroom dialogue. This perceived challenge could concern the motivation of either the whole group or individual students.

5.2.4. Pedagogical pattern 2: mixed effects in accommodating personal needs through multi-way direct teaching

Accommodating personal needs mostly related to multi-way direct teaching; it was also linked to both effective and ineffective self-perceived impacts (Table 4). The crucial mechanism in this LTT pattern was caring classroom encounters that divided the perceived impacts into *optimizing care* and *compromising care*.

In most cases that shared this LTT pattern, the STs experienced success in *optimizing care* in the classroom interaction. Essential in these incidents was the fact that the moral qualities of the instructional impact were prioritized. The STs reflected on how they met the needs of individual students during assignments by adjusting their manner of teaching according to the students' specific situations. Moral and relational matters temporarily took precedence over other aspects of the learning task. In one case, an ST reflected on how she had emotionally supported a student who had given an incorrect answer to a question. Most cases took place during interactive direct teaching when the ST was guiding the students' seatwork.

When *compromising care* as an instructional impact was perceived, the STs' reflective focus was on the struggles they experienced vis-à-vis facing some individual students' needs. The following excerpt illustrates an incident in which an ST feels that she failed to accommodate her students' personal needs during multi-way direct teaching:

ST:	In a sense, this is a kind of basic moment in the lesson. I tried to give the homework, and circulate in the classroom, and meet each student for the last time. But I find it very problematic that it is the first time I am going to see Hannah.
Supervisor:	Yeah.
ST:	I was very sorry about that. When I realized it, I somehow tried to compensate for it by praising her, like "Oh you have done so much and worked so hard and quietly today … You must have been working hard" and so on. I mean, I just realized, *Oh no! I haven't gone to see Hannah at all today!* And what's more, she is the one who would need all that support.
Supervisor:	Yeah. So, pretty easily those students who are quiet and hard-working … they just … become ignored.

In the above passage, which relates to the ST's crafts lesson, the students are working independently after the ST has presented the techniques that are required for the work. The ST reflects on the fact that when circulating in the classroom, she accidentally left one of the students without sufficient support. The ST describes her feelings and is especially sad because the specific student would have needed all the support available.

6. Discussion

In this study, we constructed a novel framework to conceptualize STs' learning by unifying three previously scattered LTT domains: teaching approaches, teacher intentions, and self-perceived instructional impact. We then applied these domains when analyzing the STs' reflections on their critical incidents that were elicited during their teaching practicums.

6.1. Theoretical implications

6.1.1. The LTT domains

In the analysis of teaching approaches in STs' critical teaching incidents, we used a dynamic categorization that went beyond the dichotomous classifications of teaching approaches. We conceptualized the teaching approaches in terms of direct teaching and constructivist teaching (cf. Gage, 2009; Sato, 2014), and with the help of Pitkäniemi (2009), we added two intermediate (multi-way) approaches that combine the main (one-way) approaches. The results showed that direct teaching approaches were emphasized in the STs' reflections. The STs seemed to experience direct teaching incidents as critical for their learning. This might be because making sense of one's identity as a teacher and taking care of instructional tasks and activities – the first two stages of teacher development, as suggested by Fuller's model (Conway & Clark, 2003) – characterize STs' early teaching experiences. What is more, when compared to constructivist teaching episodes, direct teaching incidents may be easier for STs to recognize because the teacher's role is more visible.

Interestingly, multi-way direct teaching was the single most reflected teaching approach. This is in line with Brophy's (2006) notion that direct teaching in primary classrooms seldom shows up as "lecturing" but, rather, as interactive presentations, discussions that include illustrative material, and student practices that follow teachers' explanations. Although constructivist teaching approaches were considerably less reflected on by the STs, they were represented regardless. One-way constructivist teaching was more prevalent than multi-way, indicating that when the STs reflected the constructivist approaches, they typically focused on collaborative learning and other highly student-centered activities.

In the analysis of the STs' teacher intentions, we drew on the classifications by Kennedy (2005, 2016). The ST teacher intentions that were most referred to were portraying curriculum and containing student behavior. These findings are in accordance with Kennedy (2005) in regard to in-service teachers. Thus, covering the relevant content and minimizing disruptions seemed to emerge as central concerns that already existed in the practicum classrooms.

Based on our research design, the effective and ineffective categories were used to classify the self-perceived instructional impact. In addition, these two categories were further positioned on different aspects of the instructional core (Allas et al., 2020; City et al., 2009; Stenberg et al., 2014). The pedagogical and didactical impacts – that is, those that focus on teacher – student relationships and practical organization of the content of instruction – were the two aspects that were referred to most often by the STs. Moreover, 64% of the effective impacts were didactical in nature, whereas 64% of the ineffective impacts took place within the pedagogical aspect. This suggests that teacher – students relationships were perceived as more challenging compared to the incidents in which the STs' main concern related to supporting students' learning. Moreover, the impacts that focused exclusively on the selection of the teaching substance (i.e., curricular

impact) were considerably less represented than pedagogical and didactical impacts. These results regarding the quality of the perceived impact and instructional core relationship strengthens Stenberg et al. (2014), who showed that the highly interactive and social aspects of teaching were emphasized in STs' practical theories of teaching. The result also supports the analytical approach of Männikkö and Husu (2018), whereby the instructional core was reduced to two relevant dimensions: instructional and interactive teaching functions.

6.1.2. The LTT patterns

Our second goal was to construct LTT patterns by linking the individual LTT domains. We reconstructed four LTT patterns that were emphasized in the STs' reflections on their practice. First, direct teaching approaches were enacted to portray the curriculum, and here, the self-perceived impacts were mostly effective. Second, both one-way teaching approaches – direct and constructivist – were perceived as ineffective in containing student behavior. It is interesting that the most direct and the most constructivist approaches were both likely to trigger classroom management concerns in the STs' practice.

Even though we did not explore the manifestation of multiple intentions in a single reflective discussion, these two LTT patterns (the effective portrayal of the curriculum through direct teaching and the ineffective containment of student behavior during one-way teaching) can be interpreted as being somewhat in line with Kennedy's (2005) findings regarding in-service teachers. These findings suggest that when different teacher intentions are in mutual conflict, teachers tend to prioritize classroom momentum and maintain the activity flow. Regarding the second LTT pattern (ineffective containment of student behavior during one-way teaching), previous research shows that classroom management concerns are a constant challenge for teachers' well-being (e.g., Aldrup et al., 2018). Our findings corroborate this and suggest that challenges in classroom management are often associated with specific teaching approaches.

The remaining two LTT patterns (mixed effects in enlisting student participation through multi-way direct teaching and mixed effects in accommodating personal needs through multi-way direct teaching) were both linked with multi-way direct teaching and embedded intentions to either enlist student participation or accommodate personal needs in teaching. In both patterns, the instructional impacts were perceived as mixed. Although student activation is often associated with constructivist approaches rather than direct teaching, it has been noted that teachers' active role in supporting students' participation should not be neglected (Good & Lavigne, 2018). For example, many motivational strategies, such as projecting intensity and shared enthusiasm, imply a rather active role on the part of the teacher (Good & Lavigne, 2018). However, in constructivist approaches, it might be challenging to keep the focus on meaningful learning (cf. Good & Lavigne, 2018).

The leading of whole-group instructional discussions has gained attention as a comprehensive core practice in teaching (Grossman, 2018), and this activity also showed up in our last two LTT patterns as a key method of implementing of multi-way direct teaching. As our findings indicate, mixed impacts resulted when carrying out classroom discussions.

6.2. Methodological reflections

The research design prompts some cautions that should be taken into account when interpreting and generalizing the results. First, we focused on lesson incidents that the STs themselves selected and defined as central to their learning. Therefore, the use of other, more objective criteria in the selection of STs' critical incidents may yield different findings. However, the perspective adopted in this study has been lacking in previous teacher education studies exploring teaching approaches, although the need for teachers' own analyses of their impacts has been theoretically emphasized (City et al., 2009; Hiebert et al., 2007).

Second, as the study focused on the specific meaningful incidents, the representation of the different teaching approaches more generally was not examined in this study. Further research is needed to map out STs' teaching approaches at a larger scale.

Third, only a single teacher intention was assigned to each reflective STR-interview. This holistic coding enabled us to relate the three LTT domains with each other and construct the key LTT patterns. Also, it was quite evident that each reflective discussion expressed a dominant teacher intention. However, an important aspect in teacher intentions is that they often are in tension with each other (Kennedy, 2016). Thus, further studies should explore how STs' balance multiple intentions in their practice. This could be done with more detailed coding units and possibly with extended observation periods.

Fourth, the four LTT patterns that emerged in this study covered about two-thirds of the critical incidents. Therefore, the less prevalent patterns, especially those linked to constructivist teaching approaches, also need to be analyzed further in future studies.

6.3. Practical implications

The results of this study help teacher educators to see the relevance of and interrelationships between the three LTT domains while supporting STs through their reflections on their critical teaching incidents. Through explicated teacher intentions, teacher educators can guide STs' use of different teaching approaches, thereby helping STs improve their instructional impact and, in turn, better support students' learning in their future classrooms.

When implemented with practice-based reflection protocols, such as the guided reflection procedure, it helps STs and teacher educators to consider together various alternatives in teaching approaches and align them with teacher intentions. When instructional impact is carefully reflected upon, adjustments can be made both to teaching approaches and teacher intentions. In some cases, teaching approach might require modification, and our dynamic classification provided nuances for that process (e.g., considering multi-way variant of a main approach instead of one-way variant or vice versa, or choosing an alternative approach altogether along direct-constructivist continuum) (cf., Pitkäniemi, 2009). On the other hand, it might be ST's teacher intention in a given case that merits closer evaluation. Even if some goal may have not been achieved (e.g., containing student behavior), maybe some other has (e.g., enlisting student participation) (cf., Kennedy, 2005).

Our results offer preliminary insights into subtleties of LTT patterns that emerge during practicums. The study reveals that STs demonstrate potential in employing interactive direct teaching. This finding deserves more attention – for instance, through further in-depth analyses of STs' development in leading classroom discussions. STs faced challenges in classroom management using constructivist approaches. Greater emphasis should be placed on classroom management when employing constructivist strategies. This requires careful, prolonged scrutiny of constructivist cases such as facilitation of students' small-group work and possibilities for STs' to rehearse their approach, with the support of their mentor teachers.

The LTT framework enables teachers and researchers more broadly to face a crucial challenge, as underlined, for instance, by Kennedy (2016): supporting the development of *both* classroom practices *and* the cultivation of the educational purposes and concerns behind these practices. By analyzing teaching approaches, teacher intentions, and self-perceived instructional impact in tandem our study takes one step forward by presenting a dynamic perspective on LTT. Ultimately, LTT is meant to assist teachers in honing their teaching approaches to improve students' learning outcomes in schools.

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References

Aldrup, K., Klusmann, U., Lüdtke, O., Göllner, R., & Trautwein, U. (2018). Student misbehavior and teacher well-being: Testing the mediating role of the teacher–student relationship. *Learning and Instruction*, *58*, 126–136. https://doi.org/10.1016/j.learninstruc.2018.05.006

Allas, R., Leijen, Ä, & Toom, A. (2017). Supporting the construction of teacher's practical knowledge through different interactive formats of oral reflection and written reflection. *Scandinavian Journal of Educational Research*, *61*(5), 600–615. https://doi.org/10.1080/00313831.2016.1172504

Allas, R., Leijen, Ä, & Toom, A. (2020). Guided reflection procedure as a method to facilitate student teachers' perception of their teaching to support the construction of practical knowledge. *Teachers and Teaching*, *26*(2), 166–192. https://doi.org/10.1080/13540602.2020.1758053

Ball, D. L., & Forzani, F. M. (2009). The work of teaching and the challenge for teacher education. *Journal of Teacher Education*, *60*(5), 497–511. https://doi.org/10.1177/0022487109348479

Biesta, G. (2013). Giving teaching back to education: Responding to the disappearance of the teacher. *Phenomenology and Practice*, *6*(2), 35–49. https://doi.org/10.29173/pandpr19860

Brophy, J. (2006). Graham Nuthall and social constructivist teaching: Research-based cautions and qualifications. *Teaching and Teacher Education*, *22*(5), 529–537. https://doi.org/10.1016/j.tate.2006.01.008

Calderhead, J. (1981). Stimulated recall: A method for research on teaching. *The British Journal of Educational Psychology*, *51*(2), 211–217. https://doi.org/10.1111/j.2044-8279.1981.tb02474.x

Cao, Y., Postareff, L., Lindblom-Ylänne, S., & Toom, A. (2019). Teacher educators' approaches to teaching and connections with their perceptions of the closeness of their research and teaching. *Teaching and Teacher Education*, *85*, 125–136. https://doi.org/10.1016/j.tate.2019.06.013

Chazan, D., Herbst, P. G., & Clark, L. M. (2016). Research on the teaching of mathematics: A call to theorize the role of society and schooling in mathematics instruction. In D. H. Gitomer & C. A. Bell (Eds.), *Handbook of research on teaching* (5th ed, pp. 1039–1097). AERA.

City, E. A., Elmore, R. F., Fiarman, S. E., & Teitel, L. (2009). *Instructional rounds in education: A network approach to improving teaching and learning*. Harvard Education Press.

Clark, C. M., & Peterson, P. L. (1986). Teachers' thought processes. In M. C. Wittrock (Ed.), *Handbook of research on teaching* (3rd ed, pp. 255–296). AERA.

Conway, P. F., & Clark, C. M. (2003). The journey inward and outward: A re-examination of Fuller's concerns-based model of teacher development. *Teaching and Teacher Education*, *19*(5), 465–482. https://doi.org/10.1016/S0742-051X(03)00046-5

Darling-Hammond, L. (2008). Knowledge for teaching: What do we know? In M. Cochran-Smith, S. Feiman-Nemser, D. J. McIntyre, & K. E. Demers (Eds.), *Handbook of research on teacher education: Enduring questions in changing contexts* (3rd ed, pp. 1316–1323). Routledge.

de Vries, S., Jansen, E. P. W. A., Helms-Lorenz, M., & van de Grift, W. J. C. M. (2015). Student teachers' participation in learning activities and effective teaching behaviours. *European Journal of Teacher Education*, *38*(4), 460–483. https://doi.org/10.1080/02619768.2015.1061990

Fenstermacher, G. D., & Soltis, J. F. (2009). *Approaches to teaching* (5th ed.). Teachers College Press.

Fives, H., Lacatena, N., & Gerard, L. (2015). Teachers' beliefs about teaching (and learning). In H. Fives & M. G. Gill (Eds.), *International handbook of research on teachers' beliefs* (pp. 249–265). Routledge.

Gage, N. L. (2009). *A conception of teaching*. Springer.

Gitomer, D. H., & Zisk, R. C. (2015). Knowing what teachers know. *Review of Research in Education*, *39*(1), 1–53. https://doi.org/10.3102/0091732X14557001

Goldhaber, D., Ronfeldt, M., Cowan, J., Gratz, T., Bardelli, E., & Truwit, M. (2022). Room for improvement? Mentor teachers and the evolution of teacher preservice clinical evaluations. *American Educational Research Journal*, *59*(5), 1011–1048. https://doi.org/10.3102/00028312211066867

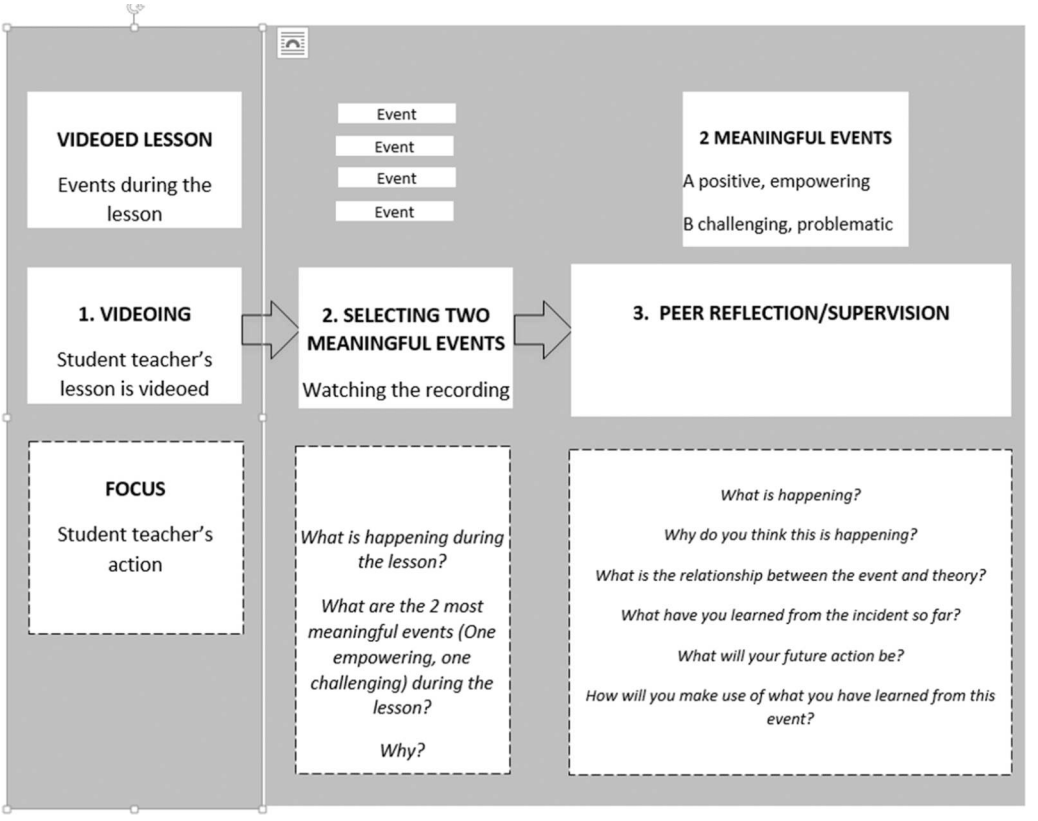
Good, T. L., & Lavigne, A. L. (2018). *Looking in classrooms* (11th ed.). Routledge.

Goodwin, D. R. (2013). Blending traditional and constructivist teaching: How one teacher goes about it in a U.S. middle school mathematics classroom. In C. J. Craig, P. C. Meijer, & J. Broeckmans (Eds.), *From teacher thinking to teachers and teaching: The evolution of a research community* (pp. 479–499). Emerald Publishers.
Grossman, P. (Ed.) (2018). *Teaching core practices in teacher education*. Harvard Education Press.
Hattie, J. A. C. (2007). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement*. Routledge.
Hiebert, J., Morris, A. K., Berk, D., & Jansen, A. (2007). Preparing teachers to learn from teaching. *Journal of Teacher Education*, *58*(1), 47–61. https://doi.org/10.1177/0022487106295726
Husu, J., Toom, A., & Patrikainen, S. (2008). Guided reflection as a means to demonstrate and develop student teachers' reflective competencies. *Reflective Practice*, *9*(1), 37–51. https://doi.org/10.1080/14623940701816642
Kennedy, M. M. (2005). *Inside teaching: How classroom life undermines reform*. Harvard University Press.
Kennedy, M. (2016). Parsing the practice of teaching. *Journal of Teacher Education*, *67*(1), 6–17. https://doi.org/10.1177/0022487115614617
Kirschner, P. A., Sweller, J., & Clark, R. E. (2006). Why minimal guidance during instruction does not work: An analysis of the failure of constructivist, discovery, problem-based, experiential, and inquiry-based teaching. *Educational Psychologist*, *41*(2), 75–86. https://doi.org/10.1207/s15326985ep4102_1
Kivelä, A., & Siljander, P. (2013). Psychologism in Finnish educational science: From herbartianism to constructivism. *Scandinavian Journal of Educational Research*, *57*(4), 369–384. https://doi.org/10.1080/00313831.2012.656282
Lam, B.-H., & Kember, D. (2006). The relationship between conceptions of teaching and approaches to teaching. *Teachers and Teaching: Theory and practice*, *12*(6), 693–713. https://doi.org/10.1080/13540600601029744
Loughran, J. (2019). Pedagogical reasoning: The foundation of the professional knowledge of teaching. *Teachers and Teaching*, *25*(5), 523–535. https://doi.org/10.1080/13540602.2019.1633294
Männikkö, I., & Husu, J. (2018). Uncovering expected teaching actions in attention demanding teaching situations. *Teacher Development*, *22*(5), 651–667. https://doi.org/10.1080/13664530.2018.1464503
Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). *Qualitative data analysis: A methods sourcebook*. Sage.
Morse, J. (2018). Reframing rigor in qualitative inquiry. In N. K. Denzin & Y. S. Lincoln (Eds.), *The Sage handbook of qualitative research* (5th ed, pp. 796–817). Sage.
Pitkäniemi, H. (2009). The essence of teaching–learning conceptual relations: How does teaching work? *Scandinavian Journal of Educational Research*, *53*(3), 263–276. https://doi.org/10.1080/00313830902917311
Prosser, M., & Trigwell, K. (2014). Qualitative variation in approaches to university teaching and learning in large first-year classes. *Higher Education*, *67*(6), 783–795. https://doi.org/10.1007/s10734-013-9690-0
Saldaña, J. (2009). *The coding manual for qualitative researchers*. Sage.
Sato, M. (2014). What is the underlying conception of teaching of the edTPA? *Journal of Teacher Education*, *65*(5), 421–434. https://doi.org/10.1177/0022487114542518
Stenberg, K., Karlsson, L., Pitkäniemi, H., & Maaranen, K. (2014). Beginning student teachers' teacher identities based on their practical theories. *European Journal of Teacher Education*, *37*(2), 204–219. https://doi.org/10.1080/02619768.2014.882309
Struyven, K., Dochy, F., & Janssens, S. (2010). Teach as you preach": The effects of student-centred versus lecture-based teaching on student teachers' approaches to teaching. *European Journal of Teacher Education*, *33*(1), 43–64. https://doi.org/10.1080/02619760903457818
Sun, J., & van Es, E. A. (2015). An exploratory study of the influence that analyzing teaching has on preservice teachers' classroom practice. *Journal of Teacher Education*, *66*(3), 201–214. https://doi.org/10.1177/0022487115574103
Tiilikainen, M., Karjalainen, J., Toom, A., Lepola, J., & Husu, J. (2019a). The complex zone of constructivist teaching: a multi-case exploration in primary classrooms. *Research Papers in Education*, *34*(1), 38–60. https://doi.org/10.1080/02671522.2017.1402080
Tiilikainen, M., Toom, A., Lepola, J., & Husu, J. (2019b). Reconstructing choice, reason and disposition in teachers' practical theories of teaching (PTs). *Teaching and Teacher Education*, *79*, 124–136. https://doi.org/10.1016/j.tate.2018.12.011
Timmermans, S., & Tavory, I. (2012). Theory construction in qualitative research: From grounded theory to abductive analysis. *Sociological Theory*, *30*(3), 167–186. https://doi.org/10.1177/0735275112457914
Tirri, K. (2014). The last 40 years in Finnish teacher education. *Journal of Education for Teaching: International Research and Pedagogy*, *40*(5), 600–609.
Tobias, S. & Duffy, T. M. (Eds.) (2009). *Constructivist instruction: Success or failure?* Routledge.
Yeh, C., & Santagata, R. (2015). Preservice teachers' learning to generate evidence-based hypotheses about the impact of mathematics teaching on learning. *Journal of Teacher Education*, *66*(1), 21–34. https://doi.org/10.1177/0022487114549470

Appendices

Appendix 1

The oral reflection part of the guided reflection procedure (cf., Allas et al., 2017, 2020; Husu et al., 2008)



Appendix 2

Guiding questions for the oral reflection (e.g., Allas et al., 2020, p. 192)

1. What is happening?
1.1. What can you see/hear yourself doing?
1.2. What can you see/hear the students doing?
1.3. Is there a relationship between what you are doing and what the students are doing?
2. Why do you think this is happening?
2.1. Which student behaviors are caused by your behavior?
2.2. Which behavior of yours is caused by the students' behavior?
2.3. What makes the incident a critical incident for you?
3. Relating the incident to theory.
3.1. Which teacher role does the incident relate to?
3.2. How does the literature support your causal explanation for section 2 (in the case of the empowering incident)?
3.3. What suggestions do the literature offer for solving this problem (in the case of the challenging incident)
4. What have you learnt from this event so far? How will you make use of the things that you have learned from this event?