Practice-Based Teacher Education Coursework:

An Examination of the Extent and Characteristics of How Teacher Education Coursework Is Grounded in Practice Across Six Teacher Education Programs in Finland, Norway and California, US.

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Summary

This thesis examines practice-based teacher education by looking at how and to what extent teacher education coursework is grounded in practice. It examines the opportunities teacher candidates have to learn from practice-based coursework as well as the instructional practices contributing to these opportunities. This study is an article-based thesis, comprised of three articles and an extended abstract. The extended abstract includes theoretical framing, a review of research on practice-based teacher education coursework, sections on methods and research design, and a summary and discussion of the articles and the overall contribution of this thesis.

The theoretical framing of this study is primarily set within what I have called the enactment approach to practice-based teacher education. The thesis is further conceptually and theoretically framed within three other approaches to practice-based teacher education. In the theory chapter, I systematize the field of theory and research on practice-based teacher education to clarify this thesis' understanding of the term *practice* in practice-based teacher education. The review of research contributes further to this clarification, as it provides the conceptual and analytical framework for this thesis, constituted by eight dimensions of opportunities to learn that are grounded in practice: *plan for teaching and teacher role(s)*; *practice and rehearse teaching and teacher role(s)*; *analyze pupils' learning*; *include teaching materials, artifacts, and resources*; *talk about field placement*; *take the pupils' perspective; see models of teaching*; and *see connection to national or state curriculum.*

This thesis was designed as a multiple-case study, looking at a phenomenon (i.e., opportunities to learn that are grounded in practice as part of coursework) across three national contexts and six teacher education program. I chose this design because I was interested in the phenomenon, rather than the individual cases. Looking across these similar yet diverse cases has allowed me to find similar patterns as well as differences across the cases. As this thesis builds upon observation data, using survey data as support, the design has provided an overview and detailed information about the opportunities to learn that are grounded in practice during coursework at campus.

For an overview, Article I focuses on all eight dimensions of the analytical framework, to examine in what ways these opportunities are grounded in practice across the national settings. The article reports on observation data and identifies patterns and differences across the six programs concerning specific areas of opportunities grounded in practice that seems to be

established, while other areas remain a challenge. Based on these findings, the article argues that there seems to be a relative emphasis on different aspects of opportunities to learn that are grounded in practice, and that specific areas, such as practice related to pupils' learning, need increasing attention.

Article II focuses on one of the dimensions in the analytical framework: opportunities to *talk about field placement*. Drawing on survey data and observation data from three of the programs, it investigates the characteristics of these opportunities, as well as the teacher candidates' perception of them. The article finds that, while all candidates report extensive opportunities to *talk about field placement*, huge variance exists between the programs in how specific and detailed this talk is and in the extent to which it is linked to theoretical concepts or readings. The article highlights the importance of scaffolding and support from the teacher educator in making this talk generative for professional learning.

Article III also focuses on one of the dimensions in the analytical framework: opportunities to *analyze pupils' learning*. It reports on survey data from three of the programs and observation data from all six programs, and investigates the characteristics of these opportunities, as well as the teacher candidates' perception of them. Across data sources and programs, the article finds that the candidates have few opportunities to *analyze pupils' learning*. The article argues that opportunities to *analyze pupils' learning* constitute a potential for learning about the complexity of teaching and learning, but that teacher educators are not taking advantage of this potential in the few instances identified involving analysis of pupils' learning. The article further argues that a pedagogy of teacher education might profit from existing research on matters such as elicitation of pupils' learning when scaffolding this work for the teacher candidates.

Looking across the three articles, this thesis' main contribution is further knowledge about the extent and characteristics of opportunities to learn that are grounded in practice within teacher education coursework, and the instructional practices connected to these opportunities. It has given us knowledge about the relative emphasis of the different opportunities in our framework in the sampled programs, and started a discussion of ways to ground teacher education coursework in practice. It has also contributed with detailed knowledge about the characteristics of these opportunities and the role of the instruction and the teacher educator, especially so for opportunities to *talk about field placement* and opportunities to *analyze pupils' learning*. Further, the development of methodological instruments within this study contributes to the work to accumulate knowledge and create a common language within this field of research.

Part I: Extended Abstract

Part II: The Articles

Article I...**122**

Jenset, I. S., Klette, K., & Hammerness, K. (accepted for publication). Grounding Teacher Education in Practice around the World: An Examination of Teacher Education Coursework in Teacher Education Programs in Finland, Norway, and the United States. *Journal of Teacher Education*.

Article II...**152**

Jenset, I. S., Hammerness, K., & Klette, K. (2016). Talk about field placement within coursework on campus: Grounding teacher education in practice. In review at *Scandinavian Journal of Educational Research*.

Article III..**184**

Jenset, I. S., Canrinus, E. T., Klette, K., & Hammerness, K. (2016). Opportunities to analyze pupils' learning within coursework on campus: Making learning visible in teacher education. In review at *European Journal of Teacher Education.*

1   Introduction

In recent decades, teacher education has received increased attention from policymakers and researchers. The teacher has been recognized as an important factor for pupils' learning (Organization for Economic Co-operation and Development [OECD], 2005) and research has emphasized the importance of a high-quality teacher education (Darling-Hammond, Holtzman, Gatlin, & Heilig, 2005). Teacher education has thus been heavily recognized but also criticized, both internationally (Darling-Hammond, Bransford, LePage, Hammerness, & Duffy, 2005; OECD, 2005) and in the Nordic countries (Finne, Mordal, & Stene, 2014; Lid, 2013; Mikkola & Lähde, 2006; Norwegian Agency for Quality Assurance in Education [NOKUT], 2006). This criticism revolves around the fragmentation of teacher education and its disconnect from real classroom practice. Worldwide, policymakers and scholars thus emphasize the importance of grounding teacher education more profoundly in practice (British Educational Research Association [BERA], 2014; Darling-Hammond et al., 2017; Moon, 2016; National Council for Accreditation of Teacher Education [NCATE], 2010; NOKUT, 2006). Scholars like Kennedy (1999) have discussed "the problem of enactment", that teacher education does not prepare teacher candidates to take on the practical work in classrooms. Evidence shows that grounding teacher education in practice contribute to enhance pupils' learning (Boyd, Grossman, Lankford, Loeb, & Wyckoff, 2009; Brouwer & Korthagen, 2005; Darling-Hammond, Chung, & Frelow, 2002), to increase teacher retention (Feiman-Nemser, Tamir, & Hammerness, 2014), and to impact candidates' future practical competence in the classroom (Brouwer & Korthagen, 2005; Darling-Hammond et al., 2002).

Scholars have thus suggested to extend the amount of fieldwork for candidates (BERA, 2014; Müller, Álamos, Meckes, & Sanyal, 2015), or to organize the education in residency programs (Silva, McKie, Knechtel, Gleason, & Makowsky, 2014; Zeichner, 2016). Fieldwork throughout teacher education is indeed critical for teacher candidates' future practical competence (Anderson & Stillman, 2013; Brouwer & Korthagen, 2005; Darling-Hammond, Bransford, et al., 2005; Grossman, Hammerness, McDonald, & Ronfeldt, 2008; Korthagen, 2001; National Research Council [NRC], 2010; Ronfeldt, 2012, 2015), and teacher candidates often cite fieldwork as the most valuable education experience (Darling-Hammond, Hammerness, Grossman, Frances, & Shulman, 2005). Still, research has shown that the field placement component in teacher education is variable, and that there are challenges in ensuring its quality (Darling-Hammond, Hammerness, et al., 2005; Grossman et al., 2008).

Historically, research has highlighted the schools' role in maintaining the status quo and upholding existing teaching practices (Britzman, 2003; Lortie, 1975; Smith, Cohen, & Pearl, 1969; Zeichner & Tabachnick, 1983).

Therefore, scholars have argued that the campus site of teacher preparation is significant, but that teacher education on campus increasingly must be grounded in practice (Darling-Hammond, 2006; Hammerness et al., 2005; Levine, 2006). This research has emphasized coursework based on the knowledge and skills teacher candidates require to take on the profession's work (Darling-Hammond, Bransford, et al., 2005; Kennedy, 1999). Indeed, research has shown that strong teacher education programs combine fieldwork and coursework, thus avoiding the fragmentation characteristic of teacher education (Hammerness, 2013; Kennedy, 2008; Zeichner, 2008, 2010). NOKUT (2006) has asked for greater connections between campus courses and fieldwork in schools. A U.S. Blue Ribbon panel argued that teacher education must be "turned upside down" so practice becomes the base for learning to teach (NCATE, 2010). Certainly, researchers have shown increasing interest in instructional practices and pedagogies of teacher education that ground campus coursework in practice (Ball & Cohen, 1999; Ball & Forzani, 2009; Feiman-Nemser, 2008; Grossman, Hammerness, & McDonald, 2009). This research has argued not that field placement is of the most importance to center teacher education in practice, but rather that education at the university site should be grounded in central practices that teachers engage in (Ball & Cohen, 1999; Forzani, 2014; McDonald, Kazemi, & Kavanagh, 2013). The main aim of this thesis is to contribute to this strand of research, focusing on the coursework on campus as a site for grounding teacher education in practice.

Although scholars have acknowledged the importance of instructional practices within coursework on campus, we have little knowledge about what these instructional practices might look like. Researchers have called for further research in this area (Cochran-Smith et al., 2016; Munthe & Haug, 2009; NRC, 2010). Indeed, Cochran-Smith and colleagues noted that several studies have investigated how teacher education influenced teacher candidates' beliefs, attitudes, and understandings, or how it enabled them to reflect on teaching. Still, few studies have examined how teacher education influences the way they learn to actually teach (Cochran-Smith et al., 2016), which is the focus of this study.

1.1 Overarching Aim and Research Questions

This thesis thus enters an ongoing discussion about how to ground teacher education in practice (e.g., Forzani, 2014), and contributes to the research gap as described by Cochran-

Smith et al. (2016) by unpacking the instructional practices of teacher education that provide teacher candidates opportunities to learn that are grounded in practice, including opportunities to enact practice, during coursework. I examined the teacher education coursework in methods courses of mathematics and language arts within six university-based teacher education programs (secondary level) in Finland, Norway, and California (US), investigating the overarching research question: *To what extent and how is the coursework within these six teacher education programs grounded in practice?* I examined this through three topics of investigation, resulting in three articles. All articles drew on the same data material, but varied in terms of methods and theory applied, and type of analysis performed.

The first topic was addressed through the research question: *In what ways is candidates' coursework grounded in practice across programs in different national settings?* This study used eight dimensions of opportunities to learn that are "grounded in practice" as the analytical lens: *plan for teaching and teacher role(s)*; *practice and rehearse teaching and teacher role(s)*; *analyze pupils' learning*; *include teaching materials, artifacts, and resources*; *talk about field placement*; *take the pupils' perspective; see models of teaching*; and *see connection to national or state curriculum.* These are the key dimensions included in the conceptual and analytical framework for this thesis, further outlined in Chapter 3 and in Article I. In Article I, I investigated six teacher education programs in Norway, Finland, and California (US), and analyzed observation data ($N = 104$ hours) from the methods courses of language arts and mathematics within these programs. The study reported on the overall frequency, duration, and quality of these dimensions, rating them from 1 (low) to 4 (high), using a coding book that described distinct instructional practices. Through qualitative excerpts, the study also outlined the characteristics of these different dimensions. The study is presented in the following article, accepted for publication at *Journal of Teacher Education*:

Jenset, I. S., Klette, K., and Hammerness, K. (2016). Grounding teacher education in practice around the world: An examination of teacher education coursework in teacher education programs in Finland, Norway, and the United States.

The second topic of investigation focused on the dimension *talk about field placement* because I found that the teacher candidates had relatively frequent opportunities to do so. This study thus narrowed its scope from eight to one of the dimensions grounded in practice, through the research questions: (a) *What characterizes the opportunities teacher candidates have to talk about field placement within their coursework on campus?* and (b) *How do candidates perceive these opportunities across and between programs?* I focused on three of the teacher education programs in my sample. Article II reported on observation data ($n = 52$

hours) and survey data ($n = 264$). The study is presented in an article under review in *Scandinavian Journal of Educational Research:*

Jenset, I. S., Hammerness, K., and Klette, K. (2016). Talk about field placement within coursework on campus: Grounding teacher education in practice. Manuscript submitted for publication.

The third research topic examined the teacher candidates' *opportunity to analyze pupils' learning.* Article I suggested that the candidates had few opportunities to enact this dimension. This final study thus narrowed its scope to one of the dimensions grounded in practice by investigating: (a) *What characterizes the opportunities the candidates have to analyze pupils' learning within their coursework on campus?* and (b) *How do candidates perceive these opportunities across and between programs?* The study reported on observation data ($N = 104$ hours) and survey data ($n = 263$) from six and three of the teacher education programs, respectively. The study is presented in an article in review at *European Journal of Teacher Education:*

Jenset, I. S., Canrinus, E. T., Klette, K., and Hammerness, K. (2016). Opportunities to analyze pupils' learning within coursework on campus: Making learning visible in teacher education. Manuscript submitted for publication.

Summarizing the above, Figure 1 illustrates the relationship between the articles.
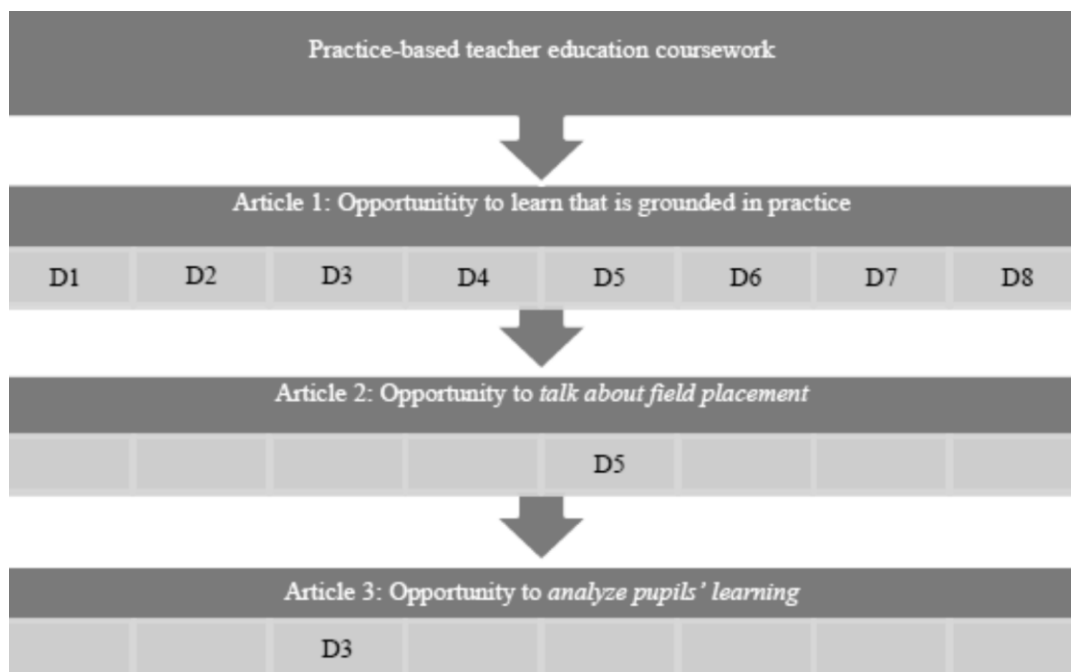
Figure 1. *Relationship and connections between the articles. Note. D1, D2, etc. signify dimensions of opportunities to learn that are grounded in practice and show which dimensions from the conceptual framework are emphasized in each article.*

The overarching focus of this thesis is the extent to which teacher education coursework is practice-based, by providing opportunities for the teacher candidates that are grounded in practice. Article I developed and examined eight dimensions of opportunities to learn that are grounded in practice within coursework. Articles II and III focused on two dimensions (i.e., *talk about field placement* and *analysis of pupils' learning*), respectively.

1.2 Central Concepts

The research questions in articles II and III use the term *characteristics*, implying both a quantitative and a qualitative aspect of the opportunities that are grounded practice. This is also apparent in the overall research question (i.e., "To what extent and how…") as well as integrated in the scores in the coding book used in Article I (and outlined in Appendix 2).

The term *practice-based* is important in this thesis, as are the concepts *opportunities to learn that are centered/grounded in practice* (cf. Ball & Cohen, 1999), and *enactment of practice*. I will thoroughly elaborate on these terms in Chapters 2 and 3. For now, I will limit the clarification of these terms by emphasizing that I am not interested in entering the discussion about connections between theory and practice in teacher education in general. Rather, I have limited the scope of this thesis to examine the campus site or coursework of teacher education and the extent to which it is grounded in practice (see Figure 2).
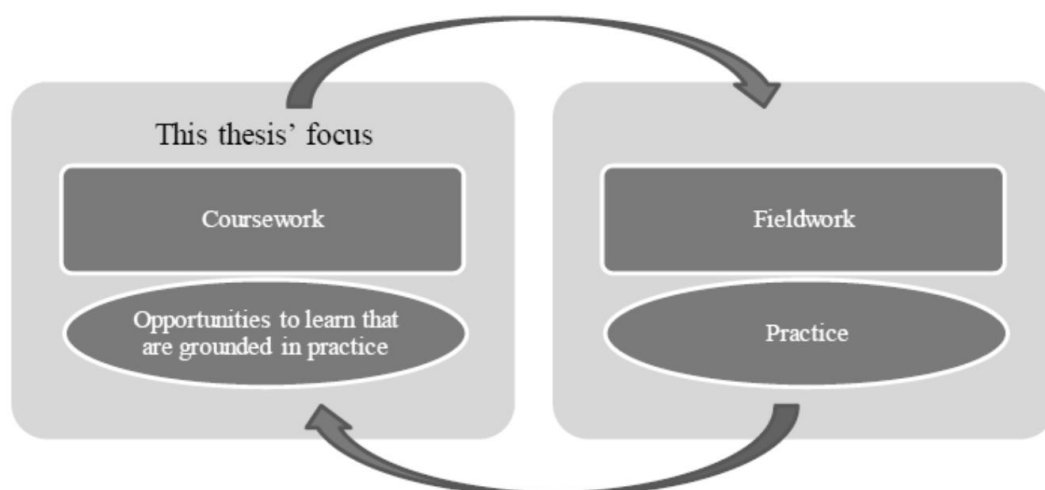
Figure 2. *The relationship between opportunities to learn that are grounded in practice (left) and practice (right).*

I have studied opportunities to learn that are grounded in practice (Figure 2, left rectangle), whereas the examinations have excluded the right rectangle. However, close relationship exists between these two aspects of practice in teacher education, as evident in Article II. This limitation of my research interest makes research on mentoring during field placement (e.g.,

Hobson, Ashby, Malderez, & Tomlinson, 2009; Mullen, 2012), as well as research on the practice shock (e.g., Korthagen and Kessels, 1999) beyond the focus of this thesis.

Further, all research questions focus on the teacher candidates' "opportunities to learn that are grounded in practice." This concept is derived from the concept "opportunities to learn," referring to "inputs and processes within a school context necessary for producing student achievement of intended outcomes" (Stephen & Brendan, 2016, p. 1). Building on a model of school learning (Carroll, 1963), the degree of learning is seen as a function of (a) opportunity to learn, or time allocated for learning, in addition to four other factors: (b) the quality of instruction, (c) the amount of time an individual needs to learn a given task, (d) the amount of time the individual is willing to engage actively in learning, and (e) the individual's ability to understand instruction (Floden, 2002). In my context, (a) time allocated for practice-based activities in teacher education coursework and (b) the associated quality of instruction are key elements. Although I concentrate on these two aspects, the other factors (e.g., ability to understand instruction) also impact the degree of learning by the teacher candidates.

All research questions focus on coursework as the site of interest, and the chosen courses are the mathematics and languages arts methods courses. The term *methods courses* in this thesis signifies the subject-specific pedagogical courses within the teacher education program[1].

Finally, the focus on the quality of instruction inevitably led to an interest in *instructional practices* or *pedagogies* of teacher education. I use these terms interchangeably to refer to attempts to articulate teaching practices of teacher education that are targeted to ground teacher education in practice. This attempt is in line with, and builds upon, other scholars in the field proposing "pedagogies of teacher education" (e.g., McDonald et al., 2013).

1.3 Research Design: The Coherence and Assignment in Teacher Education Study (CATE)

This thesis is part of the *Coherence and Assignment Study in Teacher Education* (CATE),[2] situated at the Department of Teacher Education and School Research at the University of Oslo and funded by the Research Council, Norway (Grant #212289). CATE is an international multiple-case study, designed to answer the call for international research in teacher education, focusing on the instructional practices within teacher education coursework. CATE aimed to explore features of coherence within teacher education, focusing on analytical concepts such as *vision*, *program coherence*, and *grounding in practice* (Hammerness & Klette, 2015). This

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[1] Similar terms include curriculum and instruction courses, pedagogical content knowledge courses, or subject didactical courses.
[2] To read more, visit: http://www.uv.uio.no/ils/english/research/projects/cate/

was done through a variety of data sources: document data on program level; survey of teacher candidates; interviews with program directors, teacher educators, and teacher candidates; and observation data from the coursework on campus.

This thesis focused on a slice of the CATE project; specifically, the analytical focus is the grounding in practice, and the data was derived from observation data mainly, supported by surveys. Some aspects of the thesis were developed in close collaboration with the other members of the CATE team. This includes the overall study design and the conceptual and analytical framework (i.e., the eight dimensions used for analyzing how teacher education was grounded in practice), as well as co-authorship on the articles included in this thesis. In the remains of this extended abstract, I will thus interchangeably use the pronouns *I* and *we* when explaining choices made or actions taken.

1.4 Examining Teacher Education across Contexts: California (US), Finland, and Norway

This thesis examines teacher education in three countries. This is demanding, as the three countries constitute different national historical contexts of teacher education (cf. Blömeke & Paine, 2008). I discuss this at further length in the methods chapter (Chapter 3), but I will briefly point to the national contexts here.

In the US, teachers have traditionally been educated through several pathways, including universities (Zeichner, 2016). Zeichner (2016) noted an ongoing debate in the US where teacher education receives dual criticism from within the university for not keeping up with academic standards and from the schools for failing to prepare candidates for the practical reality they are entering. Zeichner (2016) identified efforts to "disrupt" university-based teacher education in the US. The result has been the development of alternative pathways into teaching (Darling-Hammond et al., 2002; Darling-Hammond, Holtzman, et al., 2005). The different pathways vary in terms of curriculum and opportunities offered to teacher candidates to learn, with great variance in quality and duration of programs. There is also considerable attention to measuring effects of programs, often in the form of value added to pupils' performances (Darling-Hammond, 2013; Darling-Hammond et al., 2010). Many are concerned about the emphasis of such measures, compared to measures that might be more informative for the improvement of programs (Sloan, 2015), and as a counter action, many states have developed and implemented teaching performance assessments (TPAs), meeting the needs of the field. Our sampled programs from the US are situated in California, which has the state TPA (Cal TPA), the Performance Assessment for California Teachers, (PACT), and the newer

edTPA (Sloan, 2015). The latter two are extensive portfolios where the candidates show their performance capacities, such as planning, instructing, and assessing.

The Nordic context has likewise seen increased emphasis on teacher education (Bronäs & Selander, 2006; Mattsson, Eilertsen, & Rorrison, 2011). Finland is highly recognized for its longstanding emphasis on teacher preparation including master-level teacher training as well as its skilled, autonomous teaching force (Afdal & Nerland, 2014; Hansén, Forsman, Aspfors, & Bendtsen, 2012; Niemi & Jakku-Sihvonen, 2006; OECD, 2014; Sahlberg, 2011; Sitomaniemi-San, 2015). Scholars have argued that the results achieved by Finnish pupils on international achievement tests have contributed to the high status of Finnish teacher education (Sahlberg, 2011; Tryggvason, 2009). Burn and Mutton (2015), however, noted that the link between result scores on PISA and teacher education is only inferred. Another aspect of the high quality of Finnish teacher education is its capacity to attract talented and motivated students (Niemi, 2016). The selection rate for primary teacher education is 5%−10%, while the numbers for secondary teacher education are 20%−40%, depending on subject (Niemi, 2016).

Historically, Finnish teacher education underwent significant changes in the 1970s (Hansén, Eklund, & Sjöberg, 2015; Niemi & Jakku-Sihvonen, 2006; Tirri, 2014). The result was a switch from the Nordic seminar tradition towards an academic-oriented, university-based education (Niemi, 2016; Tirri, 2014). This affected the competence expected of teacher educators, and most teacher educators in Finland today hold a PhD degree (Tirri, 2014). This is also true for many teachers in the training schools that partner with the universities and support teacher candidates during at least one placement period (Moran & Clarke, 2012). Teacher education was organized as a master's degree in 1979, and the 1970s was a period of academization in Finnish teacher education (Tirri, 2014). Further, Tirri (2014) argued that a period of decentralization followed in the 1980s, when the idea of municipal curriculum was adopted. This led to increased professional autonomy for Finnish teachers and a culture of trust, where the teachers enjoyed increased standing in society. The ideal was a research-based teacher education with the goal of creating critical thinking teachers, Tirri (2014) argued.

In Norway, the status of teachers and teacher education is somewhat different. Teacher education has particular challenges, as it is spread over too many institutions (university colleges *and* universities), and whereas many university colleges are not qualified to provide master-level education. Few applicants are qualified for the programs targeted towards primary education, but the university-based programs are far more selective (Expert committee on the role of the teacher, 2016).

Like in Finland, Norway's national teacher education tradition has existed since the early 1900s in different forms (Munthe & Rogne, 2016). However, university-based teacher education has had historically weak relations to the universities, partly due to a lack of academic standards (Munthe & Rogne, 2016). Likewise, Kvalbein (2003) described the teacher education culture at the university colleges as similar to a school culture rather than an academic culture—something she termed the seminar tradition within teacher education. Teacher candidates were followed up closely, and they would be certified unless they made fatal mistakes (Kvalbein, 2003). One current trend in the national steering of teacher education is a movement towards a research-based teacher education. Munthe and Rogne (2016) claimed that teacher education in Norway is expected to be research-based, i.e., to conduct and disseminate research. From 2019, all Norwegian teachers will be required to undergo a master's program (Norwegian Government, 2014). In addition, a graduate school for research in teacher education has been established as a means of increasing the quality of teacher education and basing it in research to a greater extent (Smith, 2015; Østern, 2016). Munthe and Rogne (2016) highlighted a simultaneous emphasis on practice in Norwegian teacher education, where research is seen as one way to strengthen knowledge about and for practice. Conway and Munthe (2015) referred to this as "research-informed clinical teacher education" (p. 146). This is further recognized in national research and development efforts, such as the national project Practice as Integrative Element in Teacher Education (Gilje, 2012), and the establishment of a Center of Excellence in Teacher Education (ProTed) in 2010 (Lund, Jakhelln, & Rindal, 2015). Even though the tradition for research on teacher preparation in Norway is still developing (Munthe & Haug, 2009), substantial resources and efforts are currently being invested in strengthening teacher education for this purpose (Munthe, Malmo, & Rogne, 2011; NOKUT, 2006; Østern, 2016).

Further information about the programs sampled follows in the methods section in Chapter 4, as well as in Appendices 4 and 5.

1.5 Short Summary

Focusing on eight distinct dimensions, this thesis investigates the extent and characteristics of teacher candidates' opportunities to learn that are grounded in practice within their coursework across three national contexts. The thesis contributes to research on practice-based teacher education, focusing on the campus site and on the instructional practices of teacher education. Table 1 summarizes research questions (RQs) and articles.

Table 1. *Summary of research questions and articles*

RQ	To what extent and how is the coursework within these six teacher education programs grounded in practice?		
Articles	Article I	Article II	Article III
Sub-RQs for articles	In what ways is candidates' coursework grounded in practice across programs in different national settings?	(a) What characterizes the opportunities the candidates have to analyze pupils' learning within their coursework on campus? and (b) How do candidates perceive these opportunities across and between programs?	(a) What characterizes the opportunities the candidates have to analyze pupils' learning within their coursework on campus? and (b) How do candidates perceive these opportunities across and between programs?
Title of article	Grounding teacher education in practice around the world: An examination of teacher education coursework in teacher education programs in Finland, Norway, and the United States	Talk about field placement within coursework on campus: Grounding teacher education in practice	Opportunities to analyze pupils' learning within coursework on campus: Making learning visible in teacher education

1.6 Overview of Extended Abstract

This thesis consists of two parts; the extended abstract (Part I) and the articles (Part II). Four chapters follow this introduction.

Chapter 2 outlines and discusses the theoretical framework for this thesis. I propose four approaches (i.e., the expertise approach, the reflective approach, the action research approach, and the enactment approach) as a way of grounding teacher education in practice. I place this study within the enactment approach to practice-based teacher education.

Chapter 3 is a review of research on practice-based teacher education coursework. It points to specific areas of knowledge within this emerging field. It concludes by emphasizing the need for further research on practice-based teacher education coursework and instructional practices within teacher education, especially in contexts outside of the US.

In Chapter 4, I clarify this thesis' study design, and I argue for and discuss my methodological choices. I explain the multiple-case approach and the research design as well as discuss the study's credibility and ethical considerations.

Finally, in Chapter 5, I summarize the three articles that comprise this thesis before I discuss their empirical, theoretical, and methodological contributions in relation to the overarching research question. I end by offering some concluding remarks and implications for further research and instructional practices in teacher education.

Throughout the extended abstract, I will refer to the articles in this thesis, and I therefore recommend reading the articles before reading the extended abstract.

2 Theoretical Framing: Practice-based Teacher Education

As previously stated, the disconnect from practice has been a returning challenge for teacher education. Although the term *practice* is extremely prevalent in research on teacher education, it remains a vague (Blikstad-Balas, 2013) and "messy" concept, which is reflected in the various definitions of practice in different contexts (Lampert, 2010; Sjöberg & Hansén, 2006). The concept of practice-based teacher education is nevertheless central in my thesis; therefore, in this chapter, I clarify how the concept is to be understood here. As such, this chapter may not be a traditional theory chapter per se, as it does not rely upon one 'grand theory'. Rather, I intend for this chapter to help theorize and systematize the field of practice-based teacher education. I thereby intend to reduce the complexity of this concept by systematizing this field of theory and research into four approaches to practice-based teacher education. I have termed these approaches *the expertise approach*, *the reflective approach*, *the action research approach*, and *the enactment approach.* I constructed these four approaches, which to some extent reflect historical periods of teacher education, but also illustrate overlapping and recurring approaches to practice-based teacher education. Rather than illustrating pure models of practice-based teacher education programs, the approaches constitute four analytical lenses, or ideal types (Weber, 1904/1949), for examining teacher education and for examining approaches to providing *opportunities* to learn that are grounded in practice, as stated in the introduction.

In the following, I outline the four approaches to practice-based teacher education before I summarize and justify the approaches by pointing to how they have provided different analytical perspectives across my articles, however with special emphasis on the enactment approach.

2.1 Four Approaches to Practice-based Teacher Education

2.1.1 The expertise approach

I deemed the first approach to practice-based teacher education the *expertise approach*. Several scholars have taken the expert as a starting point for teaching and teacher education. The US process-product studies that dominated research in teaching and teacher education in the late 1960s and 1970s focused narrowly on the expert teacher. This research intended to isolate teaching practices that correlated with better student achievement scores. Such expert practices could then be implemented through an intervention design, and their results could be monitored. Initially, the research within this approach was therefore based in behavioral

theory, focusing on learning objectives that were assessable and observable (Borko, Liston, & Whitcomb, 2007; McDonald et al., 2013). This thinking was evident in the competency-based teacher education in the US from the 1950s to the 1970s (e.g., Hodge, 2007). According to Forzani (2014), competency-based teacher education in the 1970s was typically organized in instructional modules focusing on very specific and fine-grained learning objectives, often organized through micro-teaching. This approach to teacher education has, however, been heavily criticized for being narrowly occupied with teaching techniques (Forzani, 2014). Forzani (2014) argued that adherents to this approach believed that, by observing experts, novices could plan and apply the same teaching in their own classrooms.

The 1980s witnessed a change into a more cognitive-oriented view of teaching. Research became preoccupied with teachers' thinking and knowledge, rather than teaching behavior, and judgments in the moment of teaching became evident in teacher preparation (McDonald et al., 2013). In line with these developments, and as a reaction to the process-product thinking, Berliner (1986) developed the expertise approach further. Berliner (1986, 1988, 2000) and colleagues focused specifically on differences in the performances of the expert and novice teachers. Building on the stage model of development by Dreyfus and Dreyfus (1986), Berliner and colleagues showed through empirical data from teachers that the five-stage model 'made sense.' Berliner (1988, 1994) outlined these five stages as: novice, advanced beginner, competent, proficient, and expert. Studying expert teachers showed that these teachers had certain competencies that novice teachers did not have; specifically, they had better interpretive competency and were better in predicting classroom phenomena. Likewise, they had better ability to discern the importance of events and to judge typical and atypical events. They made use of routines, and they were flexible, and able to improvise, in their teaching. In contrast, novices followed plans and rules without improvising (Berliner, 1988, 1994).

Berliner (1988, 1994) argued that, in a teacher education setting, we seem to ignore the notion of developmental stages in teaching. According to Berliner (1988, 1994), the deficiencies of novices and their inability to be flexible demand that teachers must learn how to be structured before they can be unstructured. Berliner (1994) suggested that novices might need the directions of teacher manuals that exemplify the context-free rules that novices should follow and routinize before they have gained enough experience to see patterns and teach more flexibly. Berliner (1988) argued that, through such routinization, teachers enter into "automatic" processes, which frees their attention to monitor their own performance. However, Berliner argued that, in most teacher education programs, novices are never given the opportunity to practice routines (1988, 1994). But in contrast to the process-product

approach, Berliner (1988) rejected the idea that experienced teachers should use manuals. Because experienced teachers can be more flexible in their teaching, such manuals would function like forced scripts, rather than enhancing teaching quality (Berliner, 1988).

The expertise approach has been found relevant for different professions, and was for instance further developed in nurse education (Benner, 1983). In teaching, and in teacher education, Berliner's theories were corroborated by research finding distinct differences between novice and more experienced teachers (Borko & Putnam, 1996; Livingston & Borko, 1989). The reforms towards a standards-based teacher education in the US, especially in the 1990s, were also influenced by expertise thinking, which articulated the knowledge, skills, and dispositions of teachers on different levels (Interstate New Teacher Assessment and Support Consortium, 1992; Sykes & Burian-Fitzgerald, 2004; Zeichner, 2012). Also relevant for teacher education, the expertise approach can further be identified in different approaches describing stages that teachers and teacher candidates go through in their development. Pointing to frameworks for the development of teachers and teacher candidates (e.g., Fuller and Bown (1975) and Field (1979), in addition to Berliner (1986)), Feiman-Nemser and Remillard (1996) concluded that such frameworks "generally posit an initial stage of survival and discovery, a second stage of experimentation and consolidation, and a third stage of mastery and stabilization" (p. 4). Similarly, Kagan (1992) identified three stages of teachers' development: (a) they acquire knowledge of pupils, (b) they use that knowledge to modify and reconstruct their personal images of themselves as teachers, and (c) they develop standard procedural routines, integrating classroom management and instruction.

It should be noted that every development model is heavily contested and criticized. For instance, many have emphasized that such models represent a static and fixed view of development, overlooking that people will more often move back and forth across the different stages as they grow and that sometimes they could be defined within different stages simultaneously (Dall'Alba & Sandberg, 2006). Dall'Alba and Sandberg (2006) also emphasized that a mere focus on developmental stages might veil the actual skill that one is developing. The focus on developmental stages ignores the practical context and the fact that a general professional skill, or rule, might not function in every context. Finally, Dall'Alba and Sandberg (2006) asserted that these stage models emphasize fluency and mastery of teaching practices to such an extent that the pupils' learning might be neglected.

2.1.2 The reflective approach

The cognitive orientation to teacher education in the 1980s resulted in highlighting reflection as a concept (Schön, 1983). What I call the *reflective approach* to practice-based teacher education was highly influenced by Schön's (1983) theory of 'the reflective practitioner.' Through his concepts knowledge- and reflection-in-action, he offered an epistemology of practice, based upon a close examination of what practitioners actually do (p. viii). His approach combined cognitive theories and pragmatic philosophy and was a reaction to the technical rationality that viewed professionals as instrumental problem-solvers who *apply* theory and techniques to practical problems. According to Schön (1983), this dualist understanding of theory and practice did not take the problem setting into account with its "complexity, uncertainty, instability, uniqueness and value-conflict" (p. 39). Schön (1983) argued that an epistemology of practice needed to consider these aspects, and he used the evidence of common sense to claim that our knowing is *in* our action, rather than applied prior to action. This knowledge-in-action implies that we know more than we can articulate; we have 'tacit presuppositions' about a phenomenon. From this, it follows that professionals 'reflect-in-action' (Schön, 1983). According to Schön (1983), professionals become researchers of their own practical context, constructing new theory of that unique case. Through reflection, professionals can become more explicit about their tacit understandings and repetitive practices, critique them, and make new sense of the problem setting.

Following Schön (1983, 1987), a vast body of research has highlighted the role of reflection in teacher education. Valli (1997) argued that the focus upon reflection in American teacher education was due to the role of reflection in creating *professional* teachers who can carefully consider and justify their choices and actions in complex and immediate classroom situations. However, many meanings and purposes for reflection in the field of teacher education exist (Adler, 1991; Calderhead, 1989; Hatton & Smith, 1995), and several scholars have tried to identify different types of reflection used in teacher education (Hatton & Smith, 1995; Jay & Johnson, 2002; Valli, 1997; Zeichner & Liston, 2014). Still, these approaches to teacher education oppose a more restricted view on teaching behavior that does not consider what goes on in teachers' minds and emotions (Tigchelaar & Korthagen, 2004; Valli, 1997).

This view is also evident in the European context. Korthagen and Kessels (1999) argued, like Schön, that a new, realistic approach to teacher education must overcome the traditional "application-of-theory-model" where knowledge is thought to be transferred from theoretical knowledge into practical skills (p. 5). Korthagen and Kessels (1999) asserted that theory is important in teacher education, but that the traditional approach of transmission of theory has

failed. They distinguished between *Theory* with capital *T* and *theory* with a lowercase *t*, and claimed that the latter (i.e., theory in the form of Aristotelian *phronesis*) is necessary before aggregating to a higher level with Theory, in the form of *episteme*. Tigchelaar and Korthagen (2004) emphasized this distinction and argued that teacher education must consider not only the teacher candidates' tacit knowledge, but also their feelings, meanings, values, and needs (i.e., their *Gestalts*) to integrate teacher education coursework with teacher candidates' practical experience (p. 669). According to Korthagen and Kessels (1999), theory with a small *t* helps candidates to form their Gestalts, through detail and further experiences to adjust their individual theories and schema. Then the candidates will be ready to reach the next level, where Theory with a capital *T* can inform their own teaching practice.

2.1.3 The action research approach

Similar to the reflective approach is the third approach in this outline, the *action research approach* to practice-based teacher education. A vast body of literature has investigated action research as an approach, and some have argued there is more written *about* action research than actual reports from projects using action research as a method (Herr & Anderson, 2005). However, action research has been structured in three models building upon Habermas' (1972, 1974) distinctions between: the technical, practical, and emancipatory approach to knowledge (as outlined by for instance Carr & Kemmis, 1986; Grundy, 1982; McKernan, 1996). I will structure the text around these typologies of action research: *scientific-technical*, *practical-deliberative*, and *critical-emancipatory*.

The *scientific-technical action research* originated with Lewin (1946) and his developmental work in factories (McKernan, 1996). Lewin's model of the action research process featured a series of spiraling decisions based upon repeated cycles of *planning*, *fact-finding*, *execution* and *analysis*—with the goal of evaluating practices by introducing changes and measuring the effects (McKernan, 1996). As such, Lewin's action research model was based upon an empirical-rationalistic scientific orientation (McKernan, 1996). Lewis' orientation to action research was thus quickly adopted by external consultants in the US to function as a system for setting up controlled experiments and measure results, turning it into a positivist approach it was originally opposing (Herr & Anderson, 2005). Nevertheless, Lewin's (1946) cycle prepared the ground for later typologies of action research.

Indeed, the *practical-deliberative action research* model focuses on interpretation, communication, and deliberation, rather than measurement (McKernan, 1996). For instance, Stenhouse (1975) reinforced the critique of what he called the objectives model, and argued

that practice is not improved by clearer, or higher, goals, but by enabling criticism of present performance. Stenhouse (1975) thereby emphasized the processes or procedures of education, rather than the products, and he promoted the notion of the "teacher as researcher," (p. 143) arguing that teachers should study themselves rather than being studied. Effective and high-quality curriculum development thus depends on the capacity of teachers to take a research stance (Stenhouse, 1975). According to Leitch and Day (2000), Stenhouse was influenced by earlier developments of action research, like that by Lewis, but he also included aspects of "reflective practice" (Schön, 1983), as outlined above.

Finally, the *critical-emancipatory action research* model not only focuses upon individual practice, but is also directed towards the educational system, or external structures in society (McKernan, 1996). Carr and Kemmis (1986) developed a significant action research model influenced by critical theory, Habermas, and the Frankfurter school. Carr and Kemmis (1986) argued that a critical inquiry, based upon an emancipatory knowledge interest, contributes not only to examine the interpretive meanings of educational actions, but also to overcome (social) constraints and politically empower the participants (Carr & Kemmis, 1986; McKernan, 1996). Similarly, Kemmis, McTaggart, and Nixon (2014) argued that critical participatory research aims to explore social realities to discover whether social or educational practices have unwanted consequences, such as injustice (p. 16). They argued that the process of action research as described in terms of a mechanical sequence of steps is misleading. In 1988, they advocated a process of action research through the steps planning, acting/observing, reflecting, re-planning, acting/observing, reflecting, and so on (McTaggart & Kemmis, 1988). However, they emphasized that the process is much more fluid and open, with overlapping steps and changing plans due to learning from experience in their own context (Kemmis et al., 2014).

Within teacher education, scholars have argued that action research allows teacher education to provide candidates with the skills, knowledge, and attitude they need to conduct meaningful inquiry about their practice, which will enhance their practice and contribute to their pupils' learning (Hine, 2013). Cochran-Smith and Lytle (2009) conceptualized this in the notion of "inquiry as stance," (p. viii) referring to a position taken by teachers towards knowledge and its relationships to practice. This critical habit of mind opposes a limited view of inquiry in teacher education, provided as a course or project within the program (Cochran-Smith & Lytle, 2009). Investigating action research in graduate teacher education, Vaughan and Burnaford (2016) found that action research has evolved from a "one course model" in teacher education, to a more integrated theoretical and practical approach.

Zeichner and Noffke (2001) identified the purposes of practitioner research as: the personal, the professional, and the political. Similarly, Vaughan and Burnaford (2016) identified three goals of action research in graduate teacher education: action research as reflection; action research as participatory, critical inquiry; and action research as preparation for teacher leadership. Further, Burnaford (2011) suggested a framework for practitioner research in graduate teacher education, consisting of four aspects: inquiry, collaboration, layers of influence, and teacher leaders. All these studies point to the importance of reflection and inquiry for the professional development of individual teachers. Simultaneously, they acknowledge the role of the collective, or the community, as action research is not only important for the continuous professional development of individual teachers, but also for the development of entire systems (schools). Therefore, they also highlight the role of teachers as leaders, and that action research can contribute to enhance this role, so that the teacher candidates can contribute to their profession (Burnaford, 2011; Vaughan & Burnaford, 2016).

Still, within university-based teacher education, the introduction of action or practitioner research has caused tensions (Cochran-Smith & Lytle, 2009; Vaughan & Burnaford, 2016; Zeichner & Noffke, 2001). These tensions concern the relationship between research and practice: what should count as research, and who is permitted to conduct research (Cochran-Smith & Lytle, 2009)? The claim is often that teachers (and teacher candidates) are not trained to conduct research and that this research is not rigorous enough, is too local, and is not generalizable (Zeichner & Noffke, 2001). Zeichner and Noffke (2001) discussed trustworthiness in this regard and argued that other criteria might measure validity for this type of research, compared to the traditional academic quality measures (e.g., outcome validity). Scholars have also noted the need to create structures for cooperation and dissemination of practitioners' research, to make teaching and research on practice public and available for learning (Burnaford, 2011; Vaughan & Burnaford, 2016). In that way, action research can close the gap between research and practice, or universities and schools, as teacher candidates engage in questions that matter to them in their professional context (Burnaford, 2011; Cochran-Smith & Lytle, 2009; Vaughan & Burnaford, 2016).

Many of these studies have emphasized the role of teacher educators and noted that an action research approach is central to what candidates should do as well as to how teacher educators design the curriculum and teach (e.g., Burnaford, 2011). Vaughan and Burnaford (2016) argued that the field at large should consider how they perceive and teach action research to connect theory and practice. An increasing body of self-studies by teacher educators conducting action research with their candidates seems to do so, and summarizes

challenges and benefits of applying action research in their program. To exemplify, this includes concern that action research is too challenging and time-consuming for the candidates (Ulvik, 2014) and may not be trustworthy (Phillips & Carr, 2009); however, some have underscored action research-oriented self-studies as a means to link theory and practice while expanding candidates' conception of teaching (e.g., Kitchen & Stevens, 2008).

This outline of the action research approach to practice-based teacher education has identified clear similarities to the reflective approach. For instance, they both aim for change and development (Carr & Kemmis, 1986; Elliott, 1991; Stenhouse, 1975). However, action research goes beyond a pure reflection on or in practice towards *action*, with an inevitable goal of developing or changing practice (McAteer, 2013).

2.1.4 The enactment approach

During the last 10 years, a small, but increasing body of research has again emphasized practice as the central element of teacher education. I place this study primarily in this fourth approach to practice-based teacher education, *the enactment approach*. As stated in the introduction, this body of research highlights the campus site of teacher education (i.e., teacher education coursework) as an important site for making teacher education practice-based (Ball & Cohen, 1999; Forzani, 2014; McDonald et al., 2013), but researchers have expressed differing views on practice. Lampert (2010) described how the term has at least three different meanings within this body of research. First, teaching is seen as a *collection of practices*, or *best practices*, because teaching practices can be decomposed into small, distinct practices. These parts can therefore be separately rehearsed, or *practiced* for future performance. Hence, smaller, feasible practices can be mastered before entering the classroom setting with the teaching practices in their full complexity. Finally, an understanding of practice as *the practice of teaching* is evident within this approach (Lampert, 2010). The argument behind this specific understanding and use of the term *practice* is that, if teaching is a profession, like law or medicine, it has shared practices and a shared culture that should be trained and cultivated.

Even though the term *practice* is used in different ways within this approach, Forzani (2014) argued that efforts to center teacher education around practice within the enactment approach rest upon three important *ideas*. First, Forzani (2014) noted that instruction should aim at *ambitious learning goals*. Because this approach views learning as interactive work rather than knowledge transmission, it also sees teaching as specialized work. Teacher education must help teacher candidates to learn complex and improvisational practices, rather than traditional lecturing (Forzani, 2014). The second idea is that *teaching is partially*

improvisational and thus uncertain. Teaching depends on the relationship between the teacher and what she knows, the pupils and what they know and can do, and the content. This makes teaching a contingent practice that demands flexibility. However, Forzani (2014) also argued that teaching is partly predictable and that training can help candidates understand both the predictable paths of teaching and its uncertainties. The third idea is thus to *focus in depth on academically challenging content* (cf. Shulman, 2015), based upon knowledge that pupils of similar age often encounter similar problems when facing the same content. Candidates should know their subject matter in profound ways to react quickly to diverse understanding of the content. These three ideas indicate certain connections to Berliner's grounding in teaching as a complex, simultaneous practice that nevertheless can be routinized to some extent. Likewise, this approach shares commonalities with Schön's idea of the reflective practitioner.

Based upon these ideas, research on the enactment of practice has identified teaching practices that teacher candidates should master before taking the full responsibility of classrooms in schools. Such practices are identified as "core practices" (Grossman, Hammerness, et al., 2009), "high leverage" teaching practices (Ball & Forzani, 2009), or "intellectually ambitious instruction" (Lampert et al., 2013). Grossman, Hammerness, et al. (2009) defined the concept of "core practices as practices that share certain characteristics: They occur with high frequency in teaching; novices can enact them in classrooms across different curricula or instructional approaches; novices can actually begin to master them; they allow novices to learn more about pupils and about teaching; they preserve the integrity and complexity of teaching; they are research-based; and have the potential to improve student achievement" (Grossman, Hammerness, et al., 2009, p. 277). These core practices are observable in classrooms of K-12[3] teaching, and they can be decomposed to smaller micro-practices, easier handled by the teacher candidates (Grossman, Hammerness, et al., 2009).

More important for this thesis, this body of research has also emphasized instructional practices, or pedagogies, for *teacher education*, while working with these core practices. For instance, Ball and Cohen (1999) argued that teacher education could be grounded in practice by cataloguing and making records of practice accessible for teacher educators. These records of practice constitute what they called the curriculum of teacher education. This call is in line with Grossman, Compton, et al. (2009), who compared programs across professional educations such as the clergy, clinical psychology, and teaching. They suggested a framework of *representation*, *decomposition*, and *approximation* of practice, as pedagogies of practice

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[3] K-12 signifies levels of schooling from Kindergarten through 12th grade in the US context, or 1st through 13th grade in the Norwegian context.

across these professions. Complex practices should be represented to the candidates, decomposed in smaller parts, and the candidates need opportunities to engage in activities approximating the practices of the profession (Grossman, Compton, et al., 2009). Many later studies have resembled the framework proposed by Grossman, Compton, et al. (2009). For instance, McDonald et al. (2013) proposed a pedagogy of teacher education in the form of a *learning cycle* in four phases, emphasizing that one could start a teaching segment in any one of these phases. The learning cycle entails one phase of *introduction* of the complex teaching practices. Potential pedagogies would be modeling or using videos or artifacts of teaching. Another phase is *preparing for and rehearsing* the practice, where relevant pedagogies might be microteaching or rehearsals. A third phase is the actual *enactment* of the activity with pupils, alone or in cooperation with others. A fourth phase is *analyzing* the enactment and moving forward, which might appear as reflection writing (McDonald et al., 2013). Likewise, the *cycle of enactment and investigation* put forward by Lampert and colleagues (Lampert et al., 2013; Lampert et al., 2015) entailed similar steps as those above, but highlighted two stages of analysis; one after observing a complex practice and one after enacting it in the classroom. Hiebert, Morris, Berk, and Jansen (2007) kept pupils' learning as a focal point for all stages of their pedagogy. These studies proposing pedagogies of teacher education certainly exhibit connections to the reflective approach and the cycles within the action research approach, as presented above.

Still, many of the former concerns, such as reducing teaching to technique, persist today. Zeichner (2012) articulated a concern that a focus on what I have called the enactment approach might lose the broad professional vision of the teacher profession, much like the critique of the process-product approach to teacher education. In addition, he argued that a focus on practice in teacher education might reduce the teacher candidates' opportunities to learn about the historical, political, cultural, economic, and social context in which they are about to teach. Similarly, Kennedy (2015) expressed concern that the focus on teaching practices in teacher education might blur the importance of *purposes* of teaching. She suggested that teacher education should rather emphasize these purposes (she proposed five) of teaching, to some extent resembling the reflective approach to teacher education. Furthermore, Lampert (2010) highlighted different paradoxes within this approach, connected to the outline above. For instance, talking about *best* practices leads to questions of what constitutes evidence for what these best practices are. Moreover, what should the grain-size of a practice be? Similarly, what needs to be *rehearsed* for attaining proficiency, and what kind of feedback would the teacher candidates need to improve? The role of feedback is important

within this thinking around practice, according to Lampert (2010), for it not to become mere technique, but rather deliberate practice. Finally, an understanding of teaching practice as a profession, as *the practice of teaching*, opens up the question of whether practice is something each individual should learn from other individuals, or whether this is rather something shared and maintained by a collective. If the latter, how can this community be created? Moreover, who qualifies to be a master in such a community (Lampert, 2010)? An additional question is the role of theory in the enactment approach to teacher education. As shown above, the scholars within the enactment approach have argued that the core practices are theory-driven and research-based, and the pedagogies of teacher education include phases of analysis or reflection. It is not clearly stated, however, which role theory plays in these processes. To what extent is it meant that educational theory should be used and integrated by the teacher candidates during the analytical or reflective stages in the learning cycle by McDonald et al. (2013), for instance?

Forzani (2014) noted a distinction between this newer approach to practice-based teacher education and the competency-based teacher education. She argued that the body of research on core practices synthesizes a focus on technical skills with attention to professional judgement and improvisation, and that this provides a more nuanced and multidimensional vision of good teaching. Similarly, McDonald et al. (2013) emphasized that the present focus on core practices in the US is an effort to learn from all of the earlier approaches and move the field forward. They referenced The Learning to Teach In, From, and Through Practice Project (Lampert et al., 2013) to argue that such an approach is *not* focusing on bare techniques. In this project, Lampert et al. (2013) showed how rehearsals within the coursework on campus can successfully be used to interweave practical experience and coursework, while maintaining the complexity of teaching and the ambitious learning goals for the pupils. Moreover, McDonald et al. (2013) argued that the core practice movement does not intend to develop one set of universal core practices to be used by the field as a whole, but rather to develop a common language for the concept of core practices, so that the concept in itself can be used for local initiatives of practice-based teacher education. They pointed out that a common language is important if the concept of core practices is to have a standing in the development of teacher education pedagogies (McDonald et al., 2013, p. 4), and that the field of teacher education needs such a common language overall.

2.2   Short Summary

The challenges with practice-based teacher education remain unresolved. Nevertheless, this chapter has contributed to a theoretical systematization of the concept of practice-based teacher education. So far, I have tried to define and capture the meaning of practice-based teacher education by decomposing it into four different approaches. I have placed myself within the enactment approach to practice-based teacher education; however, all approaches have relevance to my thesis, and I will summarize briefly the contribution of each approach in the following.

The expertise approach highlights aspects of teaching and teacher development recognized in the enactment approach to practice-based teacher education. Specifically, the focus on the relationship between teaching as routinization and improvisation was relevant for this thesis. In addition, the development from novice to expert teacher lies as a backdrop, as teaching is viewed as a complex practice that should be decomposed and rehearsed. Moreover, in Article III, we implicitly pointed to the expertise approach, and teacher candidates' development in stages, when we argued that their preoccupation with themselves and their own teaching might be one reason for the decreased emphasis on the pupils' learning in teacher education.

This thesis has not focused on the reflective approach, although we touched upon it in Article II when discussing *talk about field placement*. Nevertheless, the reflective approach has influenced the enactment approach in distinct ways, as reflection is an important part of a *pedagogy of teacher education*, as introduced for instance in the learning cycle by McDonald et al. (2013) or in the cycle of enactment and investigation by Lampert and colleagues (Lampert et al., 2013). In addition, in Article II, the analytical categories (i.e., normalization, specification and generalization), indicated different aspects of connections between theory and practice, reflecting an opposition to an application-of-theory-model which is evident within the reflective approach to practice-based teacher education. Thus, the reflective approach provides analytical perspectives we considered while discussing the overall contribution of this thesis in Chapter 5.

Throughout my articles, I never directly mentioned the action research approach of practice-based teacher education. However, in the introduction and Chapter 3 of this extended abstract, I discuss the focus on a research-based teacher education in Finland (Jyrhämä et al., 2008; Krokfors et al., 2011; Maaranen, 2010; Westbury, Hansén, Kansanen, & Björkvist, 2005) and Norway (Munthe & Rogne, 2015; Wæge & Haugaløkken, 2013) as a way of grounding teacher education in practice. *Research-based* in this context might take many forms; for

instance, it might signify that teacher education is research- or theory-informed, that teacher candidates should take an inquiry stance, or that the involvement of candidates in research- and development projects should be emphasized (Munthe & Rogne, 2015).

I previously argued that this thesis will apply the enactment approach for analyzing ways to ground teacher education coursework in practice. The enactment approach focuses explicitly on the coursework of teacher education and the development of distinct teaching practices for teacher candidates, distinct instructional practices for teacher educators, and pedagogies for teacher education, which makes it relevant for analyzing opportunities the teacher candidates have to learn that are grounded in practice. This is evident in Chapter 3 and in Article I, where I outline the conceptual and analytical framework for this thesis, which builds heavily on this body of research. Additionally, Articles II and III explore specific opportunities that are grounded in practice within coursework on campus (e.g., *talk about field placement* and *analyze pupils' learning*), and they emphasize instructional practices for teacher educators or a pedagogy for teacher education connected to these practices.

Even though I have structured this theory section in four distinct approaches, I have nevertheless emphasized their overlap. Many teacher education programs will be based upon degrees of these approaches. Even though I have not rejected any of the outlined approaches to a practice-based teacher education, I have placed this thesis within the enactment approach of practice-based teacher education, and this thesis rests upon a view of practice in practice-based teacher education as evident within that approach. To summarize, this thesis understands practice in practice-based teacher education as *complex and situated*, highlighting the need for teacher candidates to have *opportunities to enact* these practices. This implies a need for teacher educators to develop *instructional practices* (i.e., pedagogies of teacher education) that *represent*, *decompose*, and *approximate* central practices of teaching within the coursework on campus. It simultaneously rests upon an understanding of teaching practices as something that can be *learned*, *rehearsed*, and *developed*, as well as *routinized*, over time and with support. It sees such routinization as a stepping stone for being able to *improvise* and adapt to the situation. Finally, this development of professional practice demands not only rehearsal and enactment, but also *examination* and *critical reflection* informed by research or theory, experience, and literature to *develop and change* practice.

In the following chapter, I build on the clarification of this thesis' theoretical grounding to review the body of research within the enactment approach more extensively. I also clarify my conceptual framework and specify how I understand the concept of *opportunities to learn that are grounded in practice* as an overarching framework to analyze coursework on campus.

3   Review of Research on Practice-based Coursework in Teacher Education

The previous chapter situated this thesis within the enactment approach to practice-based teacher education, and this chapter reviews this body of research. The review serves three functions. First, it provides an overview of research on practice-based teacher education coursework to identify gaps in the research literature and to justify my study. This review should thus combine and extend the reviews in my articles. The extension is specifically important, as the reviews in my articles may be biased towards the North American context whereas my data were also collected from a Nordic context. Second, the review feeds the conceptual framework for this thesis and clarifies my understanding of *opportunities that are grounded in practice* within coursework on campus. Third, this review supports the summary and discussion across the articles in Chapter 5.

This is not a systematic review (e.g., Gough, Oliver, & Thomas, 2012); nevertheless, I briefly clarify my search criteria. I conducted the literature search in the databases ERIC[4] and Oria,[5] with combinations of the terms "teacher education," "practice," "coursework," and their equivalent terms. I limited the searches from year 2000 to current, and included peer-reviewed research only. Although this approach resulted in too many hits, it missed core texts within this body of research (e.g., McDonald et al., 2013). I therefore conducted a new search with variants of the terms "core practice," "intellectual ambitious instruction," and "high leverage teaching practice," as these are central concepts within this body of research (see Chapter 2). This resulted in far fewer hits, supporting Cochran-Smith et al. (2016), who also found few studies set within this approach (p. 514). From these, I worked my way backwards and forwards to include other sources, resulting in 29 studies in the first part of this review.

Further, it proved difficult to find relevant research from the Norwegian and Finnish contexts, even when searching the equivalent Norwegian terms[6] or including variations of the terms "Norway" or "Finland" to the initial search. Indeed, through interviews with Norwegian teacher educators, Hammerness (2013) concluded that the aspect of enactment of practice seemed not to be prevalent and that teacher educators expressed skepticism in addressing methods of teaching in a practical and technical way. Further, in a review of research on teacher education in Norway between 2000 and 2010, Haugan (2011) ascertained the scarcity

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[4] See http://eric.ed.gov/
[5] See Oria.no
[6] Since I do not speak Finnish, the searches were conducted in Norwegian and English only.

of research on teacher education coursework.[7] This scarcity explains a certain bias towards North-American literature in the reviews for my articles. Although I encountered several studies discussing the theory–practice relationship in teacher education in the Norwegian (e.g., Afdal, 2016; Fosse, 2016; Fosse & Hovdenak, 2014; Hatlevik, 2014) and Finnish (e.g., Sjöberg & Hansén, 2006) context, this research did not concern instructional practices of teacher education and was therefore excluded from this review. To include research from the Nordic context, I broadened the scope by eliminating the term "coursework" from my search. I tried to choose literature that was as close as possible to the coursework on campus, and gathered 47 relevant pieces from Norway and Finland. I included research on teacher education situated at university colleges (educating for primary and lower secondary) in Norway as well as university-based teacher education (educating for secondary) due to the scarcity of research.

The distinction between research on teacher education, reviews of such research, research reports on teacher education (projects), and theory emerged from research on teacher education is often blurred. I therefore included all such sources that seemed relevant. In the following review, I thus relied heavily on: (a) summarizing reviews of research on teacher education (e.g., *Handbook of Research on Teacher Education*; (Cochran-Smith, Feiman-Nemser, McIntyre, & Demers, 2010), (b) publications of research on teacher education in journals (e.g., *Journal of Teacher Education*, *Scandinavian Journal of Educational Research*), and (c) research reports from national projects on teacher education (e.g., Gilje, 2012).

Due to these differences in search criteria and focus of research, I organized the review into two parts. I describe research on enactment of practice, mainly situated in the US (3.1) before reviewing research on practice-based teacher education in Norway and Finland (3.2). The sub-headings indicate themes found across the studies included in the review.

3.1   Research on the Enactment Approach in Teacher Education

In Chapter 2, I noted some suggestions for a pedagogy of teacher education developed within the enactment approach to practice-based teacher education (Grossman, Compton, et al., 2009; Hiebert et al., 2007; Lampert et al., 2013; McDonald et al., 2013). In the following, I take these studies as a starting point, elaborate on them further, and include other relevant studies, emphasizing instructional practices of teacher education.

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[7] Haugan's (2011) review is on research on teacher education situated in the university colleges in Norway. However, due to the scarcity of research in this context, his point is relevant in the context of university-based teacher education as well.

3.1.1 Instructional practices representing and decomposing practice

First, one key element in the identified studies was the *representation* of practice. The studies exemplified representations such as modeling, inclusion of videos or transcripts of teaching, or teaching materials (e.g., Bailey & Taylor, 2015; Barnhart & van Es, 2015; Ghousseini, 2015; Grossman, Hammerness, et al., 2009; Star & Strickland, 2008). Grossman, Hammerness, et al. (2009) claimed that modeling is a common instructional practice in teacher education and that, in these instructional situations, the teacher candidates take the role of pupils. This was exemplified in a study from New Zealand, where the candidates took the role of pupils within a problem-solving approach to teaching mathematics (Bailey & Taylor, 2015). Bailey and Taylor (2015) argued that this experience made the candidates envision how this "ambitious teaching" could be enacted in the future. However, Grossman, Hammerness, et al. (2009) argued the candidates seldom pursue the role of the teacher enacting specific teaching practices (p. 279). Further, McDonald et al. (2014) highlighted what they called "mediated field placements," (p. 501) where teacher educators teach their methods courses in partner schools, *modeling and deconstructing* specific teaching practices, before giving the teacher candidates opportunities to rehearse and receive feedback enabling them to enact the practice with their pupils. Ghousseini (2015) reported on a project with a similar process of modeling, rehearsing, and enactment, following a single candidate's case. Ghousseini (2015) showed how, despite modeling and decomposition of these teaching activities, the candidate encountered "problems of practice" (p. 353), due to the complexity of the classroom (i.e., the interaction with pupils and content) when enacting these activities. Ghousseini (2015) suggested that more specific attention to the individual candidates' learning trajectory is needed as well as further attention to the problems of practice in learning to teach.

Another way to represent and decompose teaching is by *watching videos or reading transcripts* of teaching. In a study by Star and Strickland (2008), pre- and post-assessments of 28 teacher candidates showed that their observation skills increased after participating in a methods course that purposefully trained these skills, using videos. Star and Strickland (2008) argued that careful scaffolding is needed in this process. They explained how candidates first viewed a video, completed a questionnaire on what they had noticed, and then completed an assignment while watching the video a second time. Hatch and Grossman (2009) emphasized that websites including videos of teaching stand in contrast to other artifacts of teaching (e.g., lesson plans) that represent teaching as a linear sequence of events, disregarding complexity. A collection of studies investigated teacher candidates' opportunities to "learn to notice" using videos of teaching (Barnhart & van Es, 2015; Sun & van Es, 2015; van Es & Sherin, 2008).

van Es and Sherin (2008) defined "noticing" as identifying what is important in a teaching situation, making connections between specific events and broader principles. They argued that teacher candidates need assistance to manage these difficult skills. They proposed the use of video to engage with these complex activities, and introduced a software tool they developed for scaffolding purposes (van Es & Sherin, 2008, p. 578). van Es and Sherin (2008) reported on written analyses of teacher candidates' own teaching, using an analytical tool describing noticing on four levels. They compared the trajectory of development in learning to notice of six candidates that had been introduced to the scaffolding tool and six candidates that had not. The findings revealed evidence of the effectiveness of the tool, as the trajectories of the experimental group proved more effective than those of the control group. Barnhart and van Es (2015) produced similar results in a study comparing an intervention group ($n = 16$) of teacher candidates with a control group ($n = 8$). The intervention group completed a course focusing on noticing pupils' learning in teaching interactions, while the others did not. Barnhart and van Es (2015) analyzed parts of the candidates' answers to their credential assessments (PACT), paying specific attention to noticing pupils' learning. They found that the candidates in the intervention group demonstrated higher sophistication in their ability to attend to, analyze, and respond to their pupils' thinking. Finally, based on a similar research design, Sun and van Es (2015) analyzed the videos included in the candidates' credential assessments with specific attention to teaching practices attending to pupils' thinking. They found that the cohort from the intervention group ($n = 26$) used a variety of responsive teaching practices, and that they did so with greater frequency, as compared to the control group ($n = 12$; Sun & van Es, 2015).

After the call by Ball and Cohen (1999) to create a curriculum for teacher education based in practice, many have done so in the context of teachers' professional development in schools (Kazemi & Franke, 2004; Little, 2004; Little, Gearhart, Curry, & Kafka, 2003). While few studies have been situated within the context of teacher education, Hiebert et al. (2007) highlighted the analysis of pupils' work as a way to pay attention to pupils' learning, rather than the teacher candidates' own teaching. They emphasized that the teacher candidates must be able to distinguish better sources for collecting evidence of learning, when these sources should be selected, which kind of work should be collected, and aspects of that specific work that are evidence of achievement of the learning goals.

3.1.2 Planning as an instructional practice

Planning has been part of the instructional repertoire for decades, and was emphasized by several scholars in the field (Grossman, Compton, et al., 2009; McDonald et al., 2013; Windschitl, Thompson, Braaten, & Stroupe, 2012). In their leaning cycle, McDonald et al. (2013) highlighted a phase of collective planning, as they saw learning as a collective activity where joint planning is revised after a phase of rehearsing. In addition, Windschitl et al. (2012) emphasized planning as a core practice of teaching in their longitudinal, multi-site, multi-case study. They developed a tool to guide the candidates' planning, focusing on constructing the big ideas of science. In a cross-professional study, Grossman, Compton, et al. (2009) found that the teacher candidates, compared to the candidates in the other professions (e.g., clergy and clinical psychology), had many opportunities to enact pre-active practices of teaching, such as lesson planning, unit planning, and planning for classroom management, but few opportunities to approximate the more interactive practices, such as conducting a classroom discussion. In a self-study (Peercy, 2014), a teacher educator echoed these findings as she tried to implement core practices as a part of her instruction of secondary language teachers. Studying her own syllabi, course assignments, assessments, and reflective journals, Peercy (2014) found that she failed in making her instruction more practice-based, as she had not incorporated it in a holistic pedagogy of teacher education. She claimed that her teacher candidates received extensive opportunities to plan and discuss the *how*s of practice, but that they did not have repeated opportunities to enact these teaching practices and receive feedback on their performances. She concluded that she had conducted teaching *about* teaching, rather than engaging her candidates in *doing* teaching (Peercy, 2014).

3.1.3 Rehearsal as an instructional practice

The *rehearsal* was highlighted as a third aspect of instructional practices in teacher education (Grossman, Hammerness, et al., 2009; Lampert et al., 2013; McDonald et al., 2013). Grossman, Hammerness, et al. (2009) argued that rehearsal is a pedagogy of teacher education that enables candidates to approximate complex teaching practices in settings of reduced complexity. In the Lampert et al. (2013) study, the teacher candidates used rehearsals to learn the complex practice of eliciting pupils' learning. Lampert et al. (2013) analyzed 30 video-filmed rehearsals and found that teacher educators most frequently gave directive feedback to provide specific guidance to the teacher candidate conducting the rehearsal; in other words, they made specific requests for a next move or speculated about relevant options. Evaluative feedback (i.e., when the teacher educator specified what went well or not) occurred about one-

quarter of the time. The teacher educators also scaffolded the enactment (one-fifth of the instances) by taking the teacher's or the pupil's role, providing examples of what might presumably occur in a realistic setting. Finally, the teacher educator facilitated discussions around the rehearsal, leading to reflections around the specific practice. Lampert et al. (2013) concluded that rehearsals allow candidates to approximate a complex practice and to develop an adaptive performance, simultaneously considering many aspects of the teaching context.

Similarly, Kazemi, Ghousseini, Cunard, and Turrou (2016) reported from the same study, arguing that rehearsals require the creation of a culture of making one's practice public. They found that the teacher educators did this by establishing norms for rehearsal participation and by helping the teacher candidates develop the habit of making their teaching public; for instance, they might stop the rehearsal, ask candidates how they feel, and offer strategic feedback on their performance. Additionally, Kazemi et al. (2016) claimed that rehearsals are shaped by the teacher candidates' experience with the instructional activity they are rehearsing, and how closely connected in time these experiences are. For instance, the teacher educator might intervene and remind the teacher candidate rehearsing of the typical language the pupils would use in that specific situation, reducing the complexity of the situation for the candidates.

Dotger (2015) made a similar point studying a specific kind of rehearsal, i.e., simulation. He argued simulations entails uncertain, engaging, and formative qualities, and therefore highlighted this as a "signature pedagogy" (p. 219) (cf. Shulman, 2005) for teacher education. Charalambous, Hill, and Ball (2011) likewise used simulations when investigating teacher candidates' ability to provide instructional explanations. Through pre- and post-tests of teacher candidates' ($n = 16$) responses to a cartoon teacher's instructional explanations in a simulated video, they found that the practice of instructional explanations is learnable. However, they also argued that simply giving the candidates opportunities to reflect on their performances is not enough; the practice of instructional explanations must be maintained through structures for deliberate and active reflection. Windschitl et al. (2012) also described the use of scaffolds to support the teacher candidates in rehearsals. They developed specific discourse tools as a template for a series of exchanges between teachers and pupils. These tools were not intended to work as a script, but rather as a way to provide alternatives of discourse as the conversation developed. These tools might be used both during rehearsals and during the enactment of teaching in K-12 classrooms. They also developed a protocol of "performance progression" (Windschitl et al., 2012, p. 892) on four levels, to be used during debriefings. Similarly, Ghousseini, Beasley, and Lord (2015) investigated the use of a script (a sequence of questions for eliciting pupils' learning) as a tool during rehearsals. Based on 19

video recordings of candidates' rehearsals, they identified what they called "problem spaces" (p. 467) for the candidates to address. These included how to adapt the wording and the sequence of questions, how to respond to multiple solutions provided by the pupils, and how to represent the pupils' strategies to connect to the goal of the lesson. They argued that the use of tools such as scripts reduced the complexity of what the candidates need to accomplish, but not to the extent that they did not need to apply professional judgments within the specific context. Similarly, in a study reporting on multiple data sources (including video recordings of lessons), Lampert and Graziani (2009) found that the use of scripts for rehearsals and enactment with pupils provided routine activities that could maintain principles of ambitious teaching, as the candidates needed to adapt to content and the learners in context.

In Australia, intervention studies influenced by the enactment approach were conducted through the use of micro-teaching sessions in the methods courses of mathematics (Lai, Auhl, & Hastings, 2015) and by focusing on dialogue as a core practice for teaching (Edwards-Groves & Hoare, 2012). In another study from Australia Reid (2011) introduced "reading aloud" as a core practice of teaching, and argued that this explicit choice of a common and known practice would "make the familiar strange" (p. 306) and thus the candidates would remain novices of teaching (cf. Berliner), open for the deconstruction and representation of this specific practice. Finally, in a study from the Netherlands, Janssen, Westbroek, and Doyle (2014) investigated open-inquiry labs as a core practice of teaching, introducing a "bridging methodology" (p. 3) with scaffolds to help the candidates move from their existing perceptions of science teaching towards a realization of open-inquiry teaching.

3.1.4 Analysis and reflection as an instructional practice

Analysis and reflection are central aspects of teacher education, as highlighted in Chapter 2, and within the enactment approach this often signified that the candidates received feedback on the practices they had rehearsed or enacted (Lampert et al., 2013; McDonald et al., 2013). McDonald et al. (2013) emphasized that the analysis of the enacted teaching practice is important for the candidates to learn from their experience. They also argued that analysis and reflection throughout the learning cycle are important for the further professional development of the teacher candidates. Similarly, the study by Lampert et al. (2013) included analysis at several stages. The candidates first engaged in one collective analysis guided by the teacher educator after watching the enactment of a specific practice. Later, they engaged in another collective analysis, based on records of the individual teacher candidates' enactment of the prepared and rehearsed practices. Hiebert et al. (2007) placed analysis of pupils' learning at

the center of learning how to teach. The evaluation of whether or what the pupils have learned should inform the teacher candidates about their instructional practices, including how to adapt them further to the learner.

3.1.5 Scaffolding, support, and authenticity of approximations to practice

The studies previously described have steadily highlighted the role of the teacher educator in supporting the teacher candidates (e.g., McDonald et al., 2014; Star & Strickland, 2008), and several studies presented tools for doing so (e.g., Ghousseini et al., 2015; Windschitl et al., 2012). This scaffolding depends on the individual teacher candidates' learning trajectory (e.g., Ghousseini, 2015; Janssen et al., 2014) as well as on the context of the approximation. The instructional practices outlined above all exemplify approximations to practice, but in different settings of teacher education or with different levels of authenticity (Grossman, Compton, et al., 2009), demanding varying degrees of scaffolding and support. Grossman, Compton, et al. (2009) emphasized the instructor's role in highlighting specific features of practice and providing feedback where it would be most helpful. Also, the instructors needed to pay attention to typical and atypical experiences of practice by connecting to principled practice or theoretical framework. Similarly, McDonald et al. (2013) underlined that the phases of their learning cycle might be conducted in different settings of teacher education, with varying degrees of authenticity and support. Methods courses at universities represent a *controlled setting*, where teacher candidates can watch and analyze videos in the first phase, plan and rehearse an activity in the second phase, and finally watch and analyze videos of their own teaching after enacting a practice in their field placement. In a *designed setting*, the methods course might be held in a K-12 school, where the teacher educator can model a teaching practice with K-12 pupils. Finally, in an *authentic setting* in K-12 classrooms, the teacher candidates might enact a teaching practice with their own pupils and receive feedback from the teacher educator. Nevertheless, Ball, Sleep, Boerst, and Bass (2009) argued that there is no shared professional curriculum for teacher educators to use while teaching candidates to teach. While describing their efforts to design such materials, they pointed to important structures for collective work amongst faculty, for instance in the form of planning groups. They also highlighted distinct features of the developed curriculum, such as elaboration and detail of plans and lesson materials, although not to be used as a script.

3.1.6 Evidence of the enactment approach

A review by Cochran-Smith et al. (2016) uncovered inconsistent and inconclusive evidence of different pathways to teacher education (p. 453), and little research on impacts of specific

instructional practices (p. 494). However, some initial evidence has suggested that the use of instructional practices such as those above results in more effective teachers. For example, in a study of teacher education in New York City, Boyd et al. (2009) found that teacher candidates from teacher preparation programs emphasizing such instructional practices (e.g., opportunities to review curriculum or to plan a guided reading lesson) contribute, in their first year of teaching, to higher achievement gains of the pupils. Additionally, the literature has provided emerging evidence of the effects of these instructional practices on the teacher candidates' teaching. For instance, in a longitudinal, multi-site, multiple-case study, Thompson, Windschitl, and Braaten (2013) followed 26 candidates across a three-year period, from the context of teacher education coursework to their practicum and finally to their first year of teaching in local K-12 schools. The coursework focused on ambitious teaching practices, and Thompson et al. (2013) were interested in implications of these practices for candidates' teaching. Based on observations of teaching and interviews, they found that two-thirds of the candidates were able to implement some kind of ambitious teaching practice, despite working in non-supportive schools. Thompson et al. (2013) argued that supporting teachers over time and providing them with specific tools for enacting ambitious teaching might counter the "washing out" effect of teacher education. Still, this contrasts a study by Davin and Troyan (2015) that examined the effect of the implementation of high-leverage teaching practices, moving from coursework to the field placement site. By observing videos of four candidates' teaching, Davin and Troyan (2015) found that the candidates could implement teaching practices they were able to anticipate, rehearse, and plan for, but that they were less proficient in practices that were context-dependent, such as interaction with pupils.

3.2 Research on Practice-based Teacher Education in Norway and Finland

Because I found similar themes across the studies in the Norwegian and the Finnish contexts, I outline these studies together in the following.

3.2.1 Instructional methods and tools grounding teacher education in practice

Since the review by Haugan in 2011 the body of research in Norway focusing on ways of connecting theory and practice in teacher education has increased. Some research has investigated instruction on campus, as requested by Haugan (2011), and the research most closely connected to my focus of interest are three small-scale studies from the Norwegian context highlighting specific methods, or tools, in teacher education to connect theory and practice. Through evaluative logs from 40 teacher candidates combined with 8 interviews,

Thorsen (2012) investigated the use of rehearsals, as did Dahl (2012) across three cohorts of teacher candidates ($n = 7$; $n = 18$; $n = 30$). The transparency of the research designs and empirical findings in these two studies were somewhat weak, but both concluded that the use of practice-oriented teaching methods contribute to better connections between theory and practice. The third study, a small case study ($n = 6$) by Krumsvik and Smith (2009), reached the same conclusion based on their investigation of videopapers. A videopaper is literature where the text is annotated by digital videos, which means that theory can be illustrated by practical examples.

A body of research in Norway has investigated case-methodology in teacher education, stemming from a national reform effort to develop a problem-based, practice-oriented teacher education by the use of Information and Communications Technology (ICT) tools (Ludvigsen & Flo, 2002). At the University of Oslo, the teacher candidates produced portfolios based on written cases that were pre-fabricated, written cases they wrote themselves from their placements, and video-cases (Hauge, 2002, 2004, 2006). Hauge (2002) concluded that the case-methodology did not yet function as a boundary object (in his terminology) between theory and practice, but survey and interview data revealed that teacher candidates saw this methodology as productive in transforming theory into practice (Hauge, 2006). Two dissertations explored this further. Both Jahreie (2010) and Fosse (2011) investigated teacher candidates' learning across coursework and fieldwork, by examining the use of tools such as the lesson plan and case-methodology. Jahreie (2010) followed four candidates across their learning contexts throughout one academic year, and Fosse (2011) did the same with two groups of candidates ($n = 9$). Based on observations of activities on campus and collaborative schools, both found that the candidates' learning seemed to be context-bound, and that it was challenging for them to cross the historical and rigid boundaries between these contexts. They both concluded that the teacher candidates needed scaffolding and support while working with tools such as case-methodology and lesson plans to connect the two contexts, but emphasized that the teacher educators in their studies played a withdrawn role, both on campus and in the schools (Fosse, 2011; Jahreie, 2010).

I found few studies targeting practice-based teaching methods in teacher education coursework in Finland. In one small study, Routarinne and Ylirisku (2012) investigated the use of a video card game in a teacher education course. Teacher candidates ($n = 9$) observed snippets of videos of first-grade literacy education and wrote down their observations of these snippets on cards. In groups, they categorized the different cards into emergent themes they could agree upon. Based upon analysis of videos of the candidates undertaking the video card

game, Routarinne and Ylirisku (2012) claimed that this abstraction and categorization contributed to link theory and practice. For instance, they found that the candidates were able to refer to readings and connect it to their observations. Another study reported on the use of teacher candidates' questions during demonstrations in science education (Ahtee, Juuti, Lavonen, & Suomela, 2011). Asking the candidates ($n = 110$) to write questions for pupils, the authors found that almost half of the candidates asked inappropriate questions or no questions at all, and the authors suggested that further emphasis on questions connected to practical work in science education is needed. The study did not report, however, on teaching methods within the coursework aiming at enhancing the candidates' use of questions.

Another body of research accounts for Finnish teacher educators' and candidates' reports of teaching methods. For instance, Tryggvason (2009) interviewed 18 teacher educators in groups and found that Finnish teacher educators reported that they frequently modeled teaching and exposed their candidates to many learning theories and teaching strategies. Additionally, they reported using specific teaching techniques for discussion and arguments, as well as role-play and drama exercises (Tryggvason, 2009). Their responses contrast an earlier study by Niemi (2002), who surveyed 204 recently qualified teachers. The respondents reported that they did not see their teacher educators make use of the teaching methods they read about in the literature. The candidates rather reported that their studies were not connected to real life (Niemi, 2002). Niemi framed this study within research on active learning, and continued this strand of research with other colleagues, arguing that active learning in teacher education (e.g., group work, discussions, teaching practice) promotes professional practices (Niemi & Nevgi, 2014; Niemi, Nevgi, & Aksit, 2016). All these studies were based on an array of surveys investigating active learning and professional competencies. They defined professional competencies broadly as the knowledge and skills necessary for classroom teaching, the ability to meet the needs of different learners, collaboration with other stakeholders, and ethical commitments. Niemi and Nevgi (2014) also included a research instrument measuring the degree of research studies in teacher education, making a total of three survey instruments ($n = 341$, $n = 454$, and $n = 287$, respectively). They found that the combination of active learning and research studies reinforced each other and promoted professional competencies. A study comparing teacher education in Turkey and Finland corroborated this finding (Niemi et al., 2016) and uncovered effects on the teacher candidates' teaching competencies in classrooms. However, that impact was greater in the Turkish context, as compared to the Finnish, and the authors speculated whether this was due to the strong autonomy entailed in the Finnish educational system, both in schools and in teacher education.

3.2.2 Autonomous and reflective teachers with an inquiry stance to practice

Research on practice-based teacher education was frequently framed within a focus on research-based teacher education in the Finnish context. These studies emphasized that a research-based model of teacher education is not about educating researchers, but rather educating autonomous, professional teachers with an inquiry stance to their own teaching (e.g., Jyrhämä et al., 2008; Krokfors et al., 2011; Niemi, 2016; Toom et al., 2010). To some extent, they have emphasized the practical aspects of teacher education and highlighted the relation between their research-based approach to teacher education and teaching practices of the classroom. For instance, Krokfors et al. (2011) investigated teacher educators' appreciation of this version of a research-based model, based upon survey data ($n = 33$) and interview data ($n = 8$). They concluded that such a model must have a pragmatic orientation; specifically, inquiry should be situated closely to the everyday school practice, for teacher candidates to implement a research stance towards their own teaching. This study was part of a greater project researching a multi-modal teacher education program, educating candidates that already worked as teachers. Toom et al. (2010) concluded that in addition to focusing on practical teaching skills (what they call the "basic level"), teacher education needs to pay attention to a "conceptual level", that can promote teachers' professional development (p. 341). They emphasized that for teacher education to be research based, teacher candidates should learn to make independent pedagogical judgments, rather than getting predesigned practical tips and tricks (Toom et al., 2010). This argumentation was influenced by the thinking of Kansanen (1991, 2004), who argued that teacher education consists of a "basic level," characterized by the mastering of skills. He argued that this level develops over years, by working as a teacher, and that teacher education is not necessarily needed to develop these skills. Rather, he argued that teacher education plays a vital role in developing the "general level" of teacher education. This level deals with discussion, thinking, and reflection, and Kansanen (2004) proposed a research-based teacher education as a model to achieve this.

Norway has also witnessed a focus on research-based teacher education as a way to base teacher education in practice (Ministry of Education and Research, 2008–2009). Conway and Munthe (2015) called this the "research-informed clinical practice turn" (p. 148) in the Norwegian (and Irish) context of teacher education. They emphasized, however, that prioritizing research on a program level of teacher education is not sufficient. They underscored that they understand "research-oriented" to include an inquiry stance for teacher candidates. Munthe and Rogne (2015) argued that inquiry is a way for teachers to learn continuously with an increasingly complex classroom setting. Still, they discussed whether the

focus in the Norwegian setting privileges research at the cost of inquiry. Some Norwegian research has studied inquiry projects in teacher education. For instance, Husebo (2012) reported on an action research project conducted by five teacher candidates in collaboration with two teacher educators at the schools and two at the university. He argued that, throughout this project, a "community of practice" was established that enabled the teacher candidates to develop their own practice and to connect theory and practice (p. 467). Andreassen (2015) analyzed 13 action research reports by teacher candidates on the bachelor level and identified two orientations in these reports. He claimed that the action research is either orientated towards improving the practical context or exploring an idea (e.g., increasing their knowledge about a concept). In another study that implemented lesson study as an intervention, Helgevold, Næsheim-Bjørkvik, and Østrem (2015) found that the candidates in the intervention group ($n = 28$), as compared to the business-as-usual-group ($n = 27$), focused on the pupils' learning rather than their own teaching. The authors ascribed the differences to the use of tools (i.e., detailed lesson plans and a handbook developed within the project) in the intervention group.

All these studies claimed that action research plays a vital role in helping teacher candidates connect theory and practice. However, Ulvik and colleagues described how working with action research in teacher education is both challenging and time-consuming (Ulvik, 2014; Ulvik & Riese, 2016). Analyzing 14 action research reports conducted by her candidates, Ulvik (2014) argued that, for such work to link theory and practice, there is a need for a proper framework for conducting action research. She claimed that, if necessary resources and support are not in place, the costs might outweigh the benefits for teacher candidates, who might avoid taking an inquiry stance in the future. Ulvik and Riese (2016) further examined questionnaires, pre- and post-focus group interviews, and action research reports by 30 candidates. They problematized that the work to connect theory and practice is never-ending, and that the teacher candidates seemed to need scaffolding and support in doing so, even after completing action research.

Similarly, research on the master's thesis in the Finnish context emphasized the inquiry aspect of teacher education. In her dissertation, Maaranen (2009b) analyzed essays by the teacher candidates ($n = 9$), as well as surveys ($n = 113$, $n = 35$) and interviews ($n = 8$, $n = 23$) with them. Her findings revealed that the master's thesis was often seen as too time-consuming and work-intensive, and perhaps not worthwhile. Still, Maaranen (2010) argued that its full potential might not be met, mainly because it was not always directly targeted towards the practical aspects of teaching and the everyday life of schools. Actually, she and

her colleagues found that the teacher candidates did not experience the master's thesis as a way to integrate theory and practice. Rather, they reported that this integration took place in other courses, or at other times during their program, such as their practicum and their subject didactical courses (Maaranen, 2009b; Maaranen & Krokfors, 2008). Maaranen (2009b) asserted that the potential and function of the master's thesis should be better explained to the candidates, that the research should be given a more practical emphasis, and that schools might be included as partners to a greater extent. Nevertheless, in an interview study, Maaranen (2009a) found that the teacher candidates ($n = 23$) of the multi-mode teacher education programs also saw positive effects of the master's thesis related to their teaching. For instance, they reported increased awareness of support for pupils' learning and that they explained their teaching methods to parents more often. Further, Westbury et al. (2005) discussed how schools can be included as partners in research projects through, for example, the ELMA project at Åbo Akademi. This was a close collaboration between the university and a partnering school investigating the mathematical thinking of pupils. Teacher candidates were invited to write their master's thesis on this project, taking part in a research community and experiencing research and curriculum development within the school. Finally, studies have examined the use of the portfolio in the Finnish context (Groom & Maunonen-Eskelinen, 2006; Kaasila & Lauriala, 2012; Kynäslahti et al., 2006). Groom and Maunonen-Eskelinen (2006) compared the portfolio in the Finnish and the UK teacher education context. Through analysis of course materials, portfolios ($n = 40$), and interviews with supervisors and candidates ($n = 20$), they found that there was less focus on teaching skills (i.e., competencies and standards) in the Finnish case, as compared to the UK. The Finnish case focused more on individual and personal reflection, and the issue of teaching competencies was introduced at a later stage (Groom & Maunonen-Eskelinen, 2006). Groom and Maunonen-Eskelinen (2006) emphasized that, at both sites, the importance of guiding and support by teacher educators was essential.

3.2.3 Program features to ground teacher education in practice

A range of smaller development projects has investigated organizational structures of teacher education within the Norwegian context. Many of these are not thoroughly documented, but Gloppen (2013) investigated the trialogue (i.e., a conversation between mentor teacher, university teacher, and teacher candidate) and concluded that this way of organizing the mentor conversation in practice enhanced the teacher candidates' experience of coherence between coursework and fieldwork. A study introducing concurrent practice for 27 candidates at Norwegian University of Science and Technology (NTNU) showed that active participation

and going *from* practice to theory made it easier for the students to integrate theory and practice (Wæge & Haugaløkken, 2013). However, other research on concurrent practice revealed that candidates appreciated the intervention, whereas teacher educators felt the approach did not promote the professional development of the candidates (Halvorsen, 2014). All these studies were part of a national project from 2008-2011 to promote practice as integrative element in teacher education. Summarizing these studies, Gilje (2012) identified the five distinct contributions: collaborative *partnerships* between universities and schools; a *professional coordinator* within the schools who organizes this relationship; *dialogue conferences* between participants from schools, the university, and the teacher candidates; *trialogues* between mentor teacher, university teacher, and teacher candidate; and, practice organized *concurrently* with the teaching on campus. Other projects from Norway reported on how different models of partnership have been tested at different universities (Haugaløkken & Ramberg, 2007; Lund & Eriksen, 2016; Rørnes, 2015).

Similarly, the organizational structure of teacher education in the Finnish context has been examined, particularly within a small body of research investigating the multi-mode program at the University of Helsinki, as referred above (e.g., Krokfors et al., 2006; Kynäslahti et al., 2006). By examining essays by teacher candidates, combined with an exit survey ($n = 31$), Krokfors et al. (2006) found that the candidates in this program brought new teaching methods and pedagogical tools to their work in schools, and they simultaneously experienced that the teacher education program tried to use their practical experiences in assignments, discussions, and reflections. Similarly, in a small case study ($n = 3$) based on candidates' portfolios and interviews, Kynäslahti et al. (2006) found that, within the multi-mode program, the candidates integrated theory and practice from theory to practice, from practice to theory, and through a reciprocal integration of theory and practice. They argued that the portfolio played a vital role for the reciprocal integration to take place.

3.2.4 Research on the role of theory as means to link theory and practice

Finally, some research has examined the role of *theory and literature* in linking theory and practice. For instance, Rasmussen and Bayer (2014) compared the reading lists at teacher education programs from countries that are ranked highly on international tests (e.g., Canada, Singapore, and Finland) with a lower-ranked country (e.g., Denmark). They found that, while the teacher candidates in Singapore and Canada were expected to read literature combining research-based and practice-based knowledge, their Nordic counterparts mostly read research-based texts. The Finnish program stood out as the only one that included literature on research

methodology. Rasmussen and Bayer (2014) argued that these differences might concern the traditional division of labor between universities, responsible for theory, and schools, responsible for practice, within Danish and Finnish teacher education. They concluded that combining theory and practice, as in the programs in Canada and Singapore, "provides a more solid foundation for the students' activities during their practical training" (Rasmussen & Bayer, 2014, p. 816). Similarly, Kaasila and Lauriala (2012) examined teacher candidates' portfolios during their practicum ($n = 52$) and found that the study of research articles seemed to deepen the candidates' reflections. In the Norwegian context, Mathisen (2009) found that the candidates working the most with theory before their fieldwork reported greater learning outcomes because they had more theoretical concepts to evaluate their experiences during placement.

3.3 Short Summary of the Literature Review and Outline of the Conceptual Framework

The reviewed literature from the U.S. context on the enactment approach to practice-based teacher education revealed increased efforts to identify instructional practices relevant for teacher education. The review organized these instructional practices according to the four phases: representation and decomposition, planning, rehearsal, and analysis and reflection of teaching. Across these instructional practices, the review revealed attention to promoting the teacher candidates' actual classroom teaching and emphasizing specific attention to pupils' learning. In addition, the review suggested that the role of the teacher educator is critical in supporting and scaffolding the teacher candidates' development and learning. This was also evident in the studies that pointed to grain-size or level of authenticity of these instructional practices. Finally, the review pointed to emerging evidence of the effectiveness of these kinds of instructional practices. However, the review also indicated variability in the concepts and terms used to describe and frame these instructional practices. Thus, a need remains for a common language to unify these different strands of research. The review further gave reason to believe that many studies within this body of research have been small scale and few have examined outcome measures or effects or longitudinal results of the use of such instructional practices. Further research should look into these matters (Cochran-Smith et al., 2016). Finally, the review indicated a need for additional studies investigating the instructional practices of teacher education situated within the enactment approach of teaching. As stated in the introduction, the recent review by Cochran-Smith et al. (2016) found numerous studies on teacher candidates' knowledge and beliefs, but less research on the development of their

actual teaching practices, which they argued demand much more research attention (Cochran-Smith et al., 2016, p. 493). Furthermore, my review revealed that there is even less research within this field outside of the U.S. context.

Even though most of the research on practice-based teacher education from the Norwegian and Finnish contexts is not immediately relevant for this thesis, these reviews contributed to further knowledge and transparency about the many meanings of practice-based teacher education (cf. my four approaches outlined in Chapter 2). Overall, an increasing body of research has examined ways to ground teacher education in practice, and the review revealed similar themes across the Norwegian and Finnish contexts. Specifically, the review showed that little research has focused on instructional practices (methods, tools, and instruments) to connect theory and practice across these contexts. More studies have focused on research-based teacher education with related assignments (inquiry stance) as a way to base teacher education in practice. There was some research on program features (e.g., partnerships between schools and universities) of teacher education programs to connect the two sites of teacher education. Finally, a few studies have examined the role of theory and readings to connect to practice. The review revealed that, within the Nordic countries, connecting to practice is often framed within a research-based approach to teacher education, highlighting an inquiry stance, reflection, research literature, and continuous lifelong-learning. The latter is more prevalent in the Finnish contexts, where the master's thesis, together with an emphasis on teachers' autonomy, plays a key role in understanding teachers' professionalism. There seems to be continuous demand for research examining the instructional practices of the teacher education coursework in the Finnish and Norwegian contexts, as requested by Haugan (2011); more specifically, there is a demand for research on teacher education coursework that targets the teacher candidates' opportunities to rehearse, approximate, and enact practice (cf. Grossman, Hammerness, et al., 2009). Additionally, the reviewed research highlights the need for scaffolding and support for the teacher candidates, for them to be able to connect theory with practice (e.g., Fosse, 2011; Jahreie, 2010; Ulvik, 2014; Ulvik & Riese, 2016). This reinforces the demand for research on instructional practices in teacher education in general, and in the Nordic countries specifically.

3.3.1 Conceptual framework: "Opportunities to learn that are grounded in practice"

This thesis aims to feed into this research gap, investigating teacher education coursework, and drawing on the concepts *grounding teacher education in practice* and *the enactment approach*. While the enactment approach might be considered somewhat narrow, I chose this

framing to underscore how this approach explicitly orients itself to look at the campus site of teacher education, and how coursework can be more grounded in practice. Therefore, based on the reviewed research, we developed a conceptual framework for analyzing instructional practices that provide opportunities to learn that are grounded in practice during coursework. This was made further account for in Article I, and included the following eight dimensions: *plan for teaching and teacher role(s)*; *practice and rehearse teaching and teacher role(s)*; *analyze pupils' learning*; *include teaching materials, artifacts, and resources*; *talk about field placement*; *take the pupils' perspective; see models of teaching*; and *see connection to national or state curriculum.*

The dimension *plan for teaching and teacher role(s)* refers to the extent to which candidates have opportunities in the class to plan lessons or units and to develop instructional materials and resources (Grossman, Compton, et al., 2009; Kunzman, 2002). To *practice and rehearse teaching and teacher role(s)* has to do with the extent to which candidates have opportunities in the class period to practice, rehearse, or approximate elements of practice (Lampert et al., 2013). *Analyze pupils' learning* refers to the extent to which candidates have opportunities to practice analyzing pupils' learning, to examine or analyze K-12 pupil work, to work with pupils and analyze their skills or abilities or needs, and to look at classroom transcripts or videos and examine and analyze pupil learning (Hiebert et al., 2007). *To include teaching materials, artifacts, and resources* relates to the extent to which the candidates have opportunities to use, discuss, or analyze actual artifacts or resources from real classrooms and teaching (i.e., video of teachers, cases about teaching and teachers, samples of real K-12 pupil work, transcripts of classroom talk (Ghousseini & Sleep, 2011; Hiebert et al., 2007). *Talk about field placement* connects to the extent to which candidates have opportunities to discuss or relate what they are discussing or doing in class to their own fieldwork or student teaching. This is connected to the role of scaffolding and support by the teacher educator and the need for teacher candidates to have structure and support in reflecting on their field placement experiences (Darling-Hammond, Holtzman, et al., 2005). *Take the pupils' perspective* is defined as the extent to which candidates have opportunities to do work that their own pupils will or might do (Bailey & Taylor, 2015). *See models of teaching* concerns the extent to which candidates have opportunities to see their teacher educators explicitly modeling the kinds of practices discussed in class (McDonald et al., 2014). Finally, *see connection to national or state curriculum* has to do with the extent to which candidates have opportunities to read, review, critique, or analyze materials or resources specific to the national, state, or local context (Boyd et al., 2009; Carlgren & Klette, 2008).

The outline of the conceptual framework leads to eight dimensions that serve as a further clarification of practice-based teacher education within this thesis, as the dimensions define what is meant by "opportunities to learn that are grounded in practice" within the coursework on campus. These are summarized in Table 2, and further outlined in Article I. In addition, in articles II and III I have closely examined two dimensions: *talk about field placement* and *analyze pupils' learning*. *Talk about field placement* was examined in Article II, and we outlined and discussed sub-categories of this dimension based on empirical findings resembling a framework by Little and Horn (2007). They developed a framework for examining teachers' talk according to the categories normalization, specification, and generalization (Little & Horn, 2007) (see Table 2). The other dimension we examined in depth was *analyze pupils' learning* (Article III). Also here, the sub-categories are based in our empirical findings, and supported by research on this specific teaching practice. This resulted in three analytical sub-categories: analyzing pupils' work (Hiebert et al., 2007), analyzing videos of teaching (Brophy, 2004; Hatch & Grossman, 2009; Sun & van Es, 2015), and analyzing peers' work. These subcategories are outlined in Table 2 and discussed further in Article III.

Table 2. *Conceptual and analytical concepts used in this thesis*

Article I	Article II	Article III
Eight dimensions grounded in practice: • Plan for teaching and teacher role(s) • Practice and rehearse teaching and teacher role(s) • Analyze pupils' learning • Include teaching materials, artifacts, and resources • Talk about field placement • Take the pupils' perspective • See models of teaching • See connection to national or state curriculum	Focus dimension: Talk about field placement • Normalization • Specification • Generalization	Focus dimension: Analyze pupils' learning • Analysis of pupils' work • Analysis of peers' work • Analysis of videos of teaching

Appendix 1 outlines the eight dimensions that constitute the conceptual framework of this thesis. All dimensions should be seen as a continuum rather than fixed skills, as is further elaborated in the scoring book used for the analysis in Article I and included in Appendix 2.

4 Methods and Research Design

The purpose of this study was to examine the extensiveness and characteristics of the opportunities teacher candidates have to learn that are grounded in practice within their coursework on campus. This has been done through three research topics and three articles with belonging research questions. In this chapter, I explain the study approach as a multiple-case study and outline the research design, including sampling, data sources, and analysis. I then discuss the credibility of my research, before I end with ethical considerations and methodological limitations. To increase transparency, I have tried to be as thorough as possible in this chapter about all methodological choices made, at all stages of the study, and there is therefore some overlap with the articles in this respect.

4.1 Multiple-case Research Approach

As we do not know much about the instructional practices of teacher education (Cochran-Smith et al., 2016) and how they offer opportunities to learn that are grounded in practice, my study was designed to get detailed knowledge of this phenomenon (Hammersley, 2008; Silverman, 2006). The exploratory nature of this study made a multiple-case research design appropriate. Most prior research on teacher education has been conducted as small case studies, and researchers have requested larger studies *across* different programs (Cochran-Smith et al., 2016; Grossman & McDonald, 2008). The multiple-case design of my study allowed me to look at a phenomenon (i.e., coursework grounded in practice) across several cases (Stake, 2006). The phenomenon can be better understood because of the findings and contexts of each individual case (Stake, 2006). The individual cases are not necessarily understood completely; rather, they can be understood to the extent required to retrieve information about the phenomenon under study (Stake, 2006). Stake (2006) emphasized a continuum between interest in the cases and interest in the phenomenon per se, and he called studies like mine, primarily interested in the phenomenon, "instrumental" case studies. Evidence from the cases can show how uniformity or disparity characterizes the phenomenon (Stake, 2006).

This study was also a cross-cultural study, with its drawbacks and benefits (Blömeke & Paine, 2008; Church, 2010). Blömeke and Paine (2008) argued that, because teacher education is a cultural practice, translation of concepts and instruments requires more than a simple translation of language. They showed, for instance, the very different meanings of math pedagogy in Germany and the US. This has to do with the issue of *equivalence* in comparative

research (Church, 2010; Raivola, 1985), which is a challenge in any cross-national or comparative research. Raivola (1985) asserted that a phenomenon might be understood differently in different cultures (cultural equivalence), objects on the same level in a system might not be comparable even though the systems are (contextual equivalence), and objects might serve different roles in the system (functional equivalence). Others have pointed to problems of measurement equivalence of instruments which becomes an additional concern while doing cross-cultural research (Ary, Jacobs, & Sorensen, 2010; Church, 2010; Kleven, 2008). Still, Blömeke and Paine (2008) emphasized the benefits of comparative research as a way of deepening the understanding of one's own context, as it makes the cultural givens more explicit. Likewise Stake (2006) highlighted the diversity across cases as a way to get a broader but more nuanced picture of the phenomenon under study.

In summary, this study has been organized as an international, multiple-case study for at least two reasons. First, the in-depth case-study methodology gave me the opportunity to gather detailed information about the phenomenon under study. Additionally, as I was interested in the phenomenon of instructional practices in teacher education coursework, rather than the cases themselves, a multiple-case design was appropriate.

4.2 Sampling

In the introduction, I accounted for the national contexts of teacher education in the three associated countries. I argued that these national context make up for interesting cross-case analysis of teacher education. From each of these countries, two programs constitute my sample (all programs from the CATE study). That is the teacher education programs at the University of Helsinki and Aabo Akademi University in Finland; the University of Oslo and Norwegian University of Science and Technology (NTNU) in Norway; and Stanford University and the University of California, Santa Barbara (UCSB), in California, US[8]. In the following, I describe the sampling of these programs in more depth.

According to Stake (2006), a random selection of cases is not possible for a multiple-case study, rather cases are often chosen due to access and familiarity. To some extent, this was also the case in my study. However, the six programs also constituted a purposive sample (Creswell, 2013), as they were seen as cases that would give good insights into the phenomenon under study. Stake (2006) claimed that such purposive sampling is often preferable for multiple-case studies, rather than sampling most typical cases. The chosen cases

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[8] For the remains of this thesis, the programs will be referred to as Helsinki, Aabo, Oslo, NTNU, Stanford and UCSB, respectively. In the articles, they are anonymized, and referred to as program 1a, 1b, 2a, 2b, 3a, and 3b, respectively, in Article III, whereas in Article II Helsinki, Oslo and Stanford are referred to as program 1, 2, and 3, respectively.

should be relevant for the phenomenon under study, provide diversity across contexts, and provide opportunity to learn about complexity across contexts (Stake, 2006, p. 23).

Even though we aimed for a purposive sample of programs with shared similarities, we as researchers did not have thorough knowledge of the cases before beginning. This knowledge increases as the research project evolves, and the knowledge about the sample might change its character during the process (Flyvbjerg, 2006). We could thus base our sampling only on our own and others' knowledge of the state of the different teacher education programs in these contexts, choosing the ones that presumably would provide us with interesting findings. To find relevant teacher education programs, we looked for programs that were considered to be strong, as we assumed that stronger programs provide instructional practices that are closely connected to practice (Darling-Hammond, 2006; Levine, 2006). It is difficult to know whether a program actually is strong or not, but all programs in our sample were considered by their peers to be strong and effective (Darling-Hammond, 2006; Levine, 2006). Nevertheless, we also emphasized the degree of *reform efforts* while selecting programs. At Stanford, faculty has been attempting to enhance the coherence of the program and ground their teaching in practice since 1999, although the major changes were completed in 2002. The program was redesigned around a clear vision shared by the faculty, and there was an explicit articulation of a model for student teaching, mentoring, and supervision (Hammerness, 2006). Although with a less explicit focus on coursework grounded in practice, the UCSB program has also engaged in substantial reform efforts since 2001 (Sloan, 2015). UCSB used, for instance, assessment tools like TPAs systematically to improve their program (Peck, Gallucci, & Sloan, 2010; Sloan, 2015). Similarly, Oslo has initiated large-scale reform efforts within the last four years, building upon international research on teacher education, and highly influenced by the work done at Stanford (Engelien, Eriksen, & Jakhelln, 2015; Klette et al., 2011). In effect, the program was designed around four professional themes for teacher education to enhance coherence and common vision. In addition, all exams were based in practice, and field placement was organized in a strong partnership with cooperating schools (Engelien et al., 2015). The other Norwegian program had a less explicit focus on coursework grounded in practice, but NTNU has quite recently developed and implemented two projects to combine theory and practice in their teacher education programs. One focused on research and development projects as part of the program (Wæge & Haugaløkken, 2013), and another project worked to enhance partnerships with schools (Haugaløkken & Ramberg, 2007). Finally, the Finnish programs were included because, as stated, Finnish teacher education was considered strong and seemed to have a strong focus on a research-based approach to teacher

education, rather than an enactment approach. While faculty reported constant work adjusting and shifting different features of the Finnish programs (such as course assignments, length of fieldwork, and entrance requirements), the programs have not implemented major changes recently, except from adaptation to the Bologna framework in 2006 (Hansén et al., 2015; Jakku-Sihvonen & Niemi, 2006). The reform efforts of these programs thus differed in extensiveness and proximity of time. Some programs have conducted large-scale overhauls, while others have undertaken smaller-scale experiments adjusting or shifting specific features. Similarly, some programs have been continuously making change efforts for a decade, while other programs have recently changed the entire program of study. As such, the sampling provided diversity across contexts (Stake, 2006).

Even though the sampled programs were chosen because they provided diversity across contexts, we wanted to include only cases that were : (a) university based teacher education programs; (b) preparing teachers at the secondary level (grade 8-13); (c) situated in urban areas; and, (d) seen as rather selective. They were also of particular interest to the phenomenon under study, as they all (e) combine coursework with field placement in schools; however with varying degree of established collaboration with collaborating schools, and with variations in the organization of field placement.

The two California programs and Oslo were one-year programs that the candidates attended following a bachelor's or master's degree. The Finnish programs and NTNU had a more flexible program design, where the candidates could be part of a five-year program or a one-year program. All programs could nevertheless be characterized by the "asymmetric matrix model" (Hansén et al., 2012), where candidates completed their subject matter education in the respective departments at the university, before receiving their teacher training in a relatively integrated unit of teacher education at another department. This is opposed to an "integrated model" (cf. Hansén et al., 2012), where candidates would have received teacher training and subject matter education within one unit of teacher education.

There are also important differences between the programs, as outlined in the Articles, and summarized in Table 3.

Table 3. *Characteristics of the sampled programs*

Program	Country/ state	Organization of fieldwork		Amount of fieldwork in hours	Acceptance rates in %	No. of candidates
		Intervals	Concurrent			
Helsinki	Finland	x		540	10-40[a]	410
Aabo		x		432	89[b]	40
Oslo	Norway	x		480	20,5	160
NTNU		x		520	44	220
Stanford	California, US		x	780	-[c]	72
UCSB			x	1000	67	29

[a]Depending on subject. [b]The acceptance rate seems high, but this is because there are three different types of teachers in the Finnish education system: subject teachers, class teachers and special education teachers. Our sample is from subject teachers, and here the acceptance rates are higher than with the other teacher education programs, because these teacher candidates have already gone through one university acceptance process when initiating their major studies. In comparison, the acceptance rate for candidates applying for the class teacher program at Aabo in 2012 was only 22 %, and for the program for special education teachers 13 %. [c]This data was not obtained from Stanford.

As described in Article I, the programs' sizes varied considerably, from small programs to rather large ones with more than 400 candidates. The programs from Finland, for example, ranged from 40 candidates (Aabo) to 410 (Helsinki). The two programs from Norway were relatively large, with 160 (Oslo) and 220 (NTNU) candidates, while the two Californian programs were considered small, with 29 (UCSB) and 60 (Stanford) candidates. While UCSB is a public university, Stanford is private; however, both sites require tuition fees. Still, both programs have a long tradition of supporting teacher candidates with generous scholarships. The Nordic programs are public, and all candidates receive free tuition. The organization and amount of field placement varies considerably. The Californian programs have more hours of field placement than the Nordic programs, and the candidates in those programs also had their field placements organized concurrently with the teaching on campus (see Table 3). The acceptance rates were fairly low at all programs, with the exception of UCSB. Further information about admission requirements and criteria for deciding readiness to teach across the programs is given in Appendix 4.

Despite these differences, all the programs balanced the three pillars of teacher education (foundations, methods courses, and practice, cf. Hansén & Wikman, 2016) and offered a fairly similar "program of study" (Klette, Jenset, & Hammerness, 2016). Overall, these programs are not necessarily typical cases for their context. However, as stated, they were sampled because they constitute programs from which one might learn a lot about the phenomenon of practice-based teacher education. See also Appendix 5 for further information about the composition of the programs.

As the aim of the study was to get a targeted understanding of the extensiveness and characteristics of the opportunities to learn that were grounded in practice in the teacher education classrooms, we chose to sample the courses where we believed we were most likely to see these opportunities. We decided to collect data in the methods courses within each individual program, and not foundations (pedagogics) or field placement, which are seen as the two other pillars of teacher education (Hansén & Wikman, 2016). Further, we specifically examined language arts and mathematics methods courses. These subjects are currently prioritized in most countries, and they garner considerable policy attention due to the administration of international achievement scores in these subject areas (OECD, 2014) in all three participating countries. The preparation of teachers in these subjects is therefore of vital importance.

4.3 Data Sources and Data Gathering

This project consisted of several data sources on different levels, and with different status, as case studies often do (Yin, 1994). These are outlined in Table 4:

Table 4. *Level and status of data sources*

Data sources	Level		Status of data	
	Program	**Course**	**Primary**	**Support**
Three-week observation notes from language arts and mathematics courses		X	X	
Artifacts from language arts and mathematics courses, collected within the three-week period		X		X
Survey data	X	X		X

The three-week observation notes were course-level data and constituted the primary data source for this thesis. I used the artifact collection from the same lessons and the survey data as support data. The survey data included items on course level, as well as program level. All the data used in my PhD project was collected through the CATE study.

4.3.1 Observation data

Hammersley (2008) described how qualitative data can be viewed as naturally occurring data, remaining true to the phenomenon under study. Kennedy (1999) referred to this as level 1 approximations. Qualitative data like observation data are thus better suited to understand, unveil, and interpret meaning, and in that way see the world from the perspective of the people studied (Hammersley, 2008; Silverman, 2006). To get beyond the surface level of knowledge about the program designs, and get detailed knowledge about instructional practices of teacher

education, we collected observation data from the six programs. I was responsible for collecting data at the two programs in Norway. The data at the other sites were collected by four research assistants (see Hammerness & Klette, 2015, for an overview of the data collection). We trained assistants to take systematic fieldnotes, and asked them to capture as much detail as possible, such as spoken dialogue and exact quotations. The observations were typed during the methods course classes, as real-time observational fieldnotes. On average, research assistants completed 10–15 pages of observation notes for each class. Some of the research assistants used audio- or video-recording, but only as backup for writing out their own fieldnotes. To support the analysis, we also included a collection of artifacts, including typed or handwritten assignments, PowerPoint slides, and teacher candidates' work in class.

All observations were completed within a three-week period at each site. Each consisted of at least nine hours of teaching in each of the courses at each program, totaling 104 hours of observation. We observed about 15 hours at four of the programs; however, the other two programs offered two methods courses at the time of our observations, resulting in more hours of observations from these programs. These differences also seem to reflect differences in the number of hours of classes overall. For further information about the observation data and its characteristics, see Appendix 6.

We found that, within these three weeks, some programs featured different teacher educators while others had the same teacher educator for the duration. Clearly, three weeks is a limited period of the time in which teacher candidates have opportunities grounded in practice in their methods courses. However, observational studies from K-12 classrooms have suggested that four consecutive lessons per classroom provide sufficient information to get a first overview of the quality of the teaching (Ball & Hill, 2009; Klette, 2009). We thus estimated that approximately three weeks of teaching in a teacher education classroom would be sufficient. In hindsight, I realize that a longer period of observation would have been preferable. However, as the aim of this thesis was not to make claims about the individual programs, but rather to shed light on the phenomenon of teacher education coursework grounded in practice, I value the ability to look across these programs, rather than to examine one or two in depth. Further, a total of 104 hours of observations across these programs provide a solid ground for analysis.

4.3.2 Survey data

The survey instrument was developed for the overall CATE project, to measure the teacher candidates' perceptions of coherence and of opportunities grounded in practice in their teacher

education programs. The CATE team wanted to ensure that the instrument was linked to high-quality analytical tools previously used in other relevant educational studies. Therefore, the survey builds in part on the instrument used in the New York City Pathway Study (Boyd et al., 2006), an instrument designed to investigate characteristics of opportunities to learn in programs in the New York region.[9] As stated, I have used the survey data to support the analysis of the observation data, meaning that I have made use of specific items of interest for my research questions for Articles II and III. In Article II, we focused on the items related to the candidates' opportunities to talk about their field placement experiences; in Article III, we used items tapping into the candidates' perceived opportunities to *analyze pupils' learning*. Table 5 shows the items per article:

Table 5. *Description of survey items per article*

Article	Item	Description
II	1i	…to discuss experiences from your own student teaching (fieldwork) in your university classes
	1n	…to use theory that you are reading in class, to analyze or examine your own experiences as a classroom student-teacher
	2e	…to make connections between educational theory and the actual classroom teaching you were engaged in
III	1c	…to examine samples of K-12 student work
	1g	…to examine transcripts of real K-12 classroom talk or student discussions
	1h	…to watch or analyze videos of classroom teaching

The number-1 questions addressed the methods course the candidates were attending, and were phrased as: "Thinking back now about this particular course, how much opportunity did you have to do the following?" Question 2e focused on the program level, asking: "During your entire experience with the teacher education program, how much opportunity did you have to do the following?" The questions were rated on a scale of 1–4 (1 = "none"; 2 = "touched on it briefly"; 3 = "explored in some depth"; 4 = "extensive opportunity"). The survey is attached as a whole in Appendix 3.

We distributed the paper-and-pencil survey towards the end of the academic year of the teacher education program, and all candidates, regardless of their subject, were asked to participate. Due to problems with the data collection at three of the programs (e.g., too small sample size or reversed items not reverse rated by candidates), survey data from Stanford,

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[9] More information on the design and structure of the CATE survey can be found in Canrinus, Bergem, Klette, and Hammerness (2015).

Oslo, and Helsinki were used in this thesis. In total, 270 teacher candidates, distributed across the three programs (see Table 6), completed the survey.

Table 6. *Distribution of respondents*

Program	N	Gender (male)	
		n	%
Stanford	72	25	34.7
Oslo	122	51	41.8
Helsinki	76	24	31.6
Total	270	100	37

The response rate of two programs was close to 100%, probably because of the distribution method. The only exception to this was Helsinki (23%), due to the flexibility of the program. In Helsinki, students can decide to take specific courses in either their third or fourth year, and there are few compulsory classes. Still, nearly all candidates that were present in the class where the survey was distributed completed the survey. The sample is representative in age and subject distribution. If we had used a digital version of the survey, we might have reached different candidates, but this would probably not have increased our sample size as these types of surveys have been shown to have response rates as low as 10% to 25% (Sauermann & Roach, 2013). Across all three programs, the total group of student teachers consisted of 33% males, which is similar to the average gender distribution in the teaching population in OECD countries (OECD, 2013).

4.4 Analysis

4.4.1 Analysis of observation data

To be able to look across the six cases, we decided upon a systematic approach to analyzing the observation data. Drawing on the conceptual framework with eight dimensions describing "opportunities grounded in practice" outlined in Chapter 3, the first step of analysis was to categorize the data according to these dimensions, making our understanding of the data more systematic (Hammersley, 2010). We gave each of the dimensions descriptions or definitions as to what would count as belonging in this category, and coded the data accordingly. Appendix 1 gives the description of all dimensions. The analysis of the observation data were mainly *theory-driven* categorization or coding (Klette & Blikstad-Balas, 2016). This served two purposes: it provided detailed descriptions of what the practices in the teacher education classroom looked like, and it made a comparison across the different teacher education programs possible. The use of codes made it possible to approach a large dataset in a fairly objective manner, through a rigorous and systematic analysis, as is also described with the use

of codes for analysis of video data (Blikstad-Balas, 2016; Klette & Blikstad-Balas, 2016; Snell, 2011). A discussion of the construct validity of the dimensions and challenges of reductionism with theory-driven analysis follows in Section 4.5 on research credibility.

As a second step of data analysis, we developed a coding book (Jenset, Klette, & Hammerness, 2014) to score the dimensions. We started out with a simple coding scheme, only stating whether one category was present or not, but we ended up developing a more advanced coding book. The first attempt to create such a coding book had a generic description of the scores from 1 to 4, to capture all eight dimensions of opportunities grounded in practice. However, we finally described the scores for each individual dimension. In the final protocol, each of the dimensions is operationalized on a 1–4 scale using utterances, interaction patterns, and specific observable behaviors.

The development of the coding book was influenced by other protocols, like the Classroom Assessment Scoring System (CLASS; Pianta & Hamre, 2009), and the Protocol for Language Arts Teaching Observations [PLATO] (PLATO 5.0.). The score in our protocol measures quantity, or *time spent*, on an opportunity grounded in practice, ranging from very seldom and brief (score 1), to more frequent or with a duration constituting a main portion of the lesson (score 4). The time estimates during analysis were based upon time stamps the research assistants made in the fieldnotes, approximately every 10 minutes. The protocol also measures the *quality* of the opportunity, tapping how general or vague (score 1) these opportunities were as opposed to specific, in depth, or connected to theory (score 4). We took this choice of preference for specific, rather than vague opportunities, based on similar decisions in other protocols like PLATO 5.0, and also because other research pointed to this qualitative difference (e.g., Little & Horn, 2007). Nevertheless, it is an empirical question whether the instructional practices described on a score 4 do indeed contribute to better learning for the teacher candidates—and in turn, better teaching, and finally learning outcomes from the pupils—than would practices described on a score 2. Instruments such as the scoring book is still in their infancy, and further research will contribute to their development. Appendix 2 presents the coding book, with definitions of all scores on all dimensions.

The whole lesson was the unit of our scoring. Lessons lasted from 45 to 60 minutes or more, but the duration was consistent within each program. This meant that each dimension was assigned a score in every lesson. This is contrary to protocols using intervals of 10 or 15 minutes for a score (e.g., PLATO 5.0.). We made this choice because of the current scarcity of research regarding teaching practices in teacher education, in addition to an assumption that

the teaching in teacher education classrooms may be less repetitive than in K-12 classroom. Finally, the time stamps in the fieldnotes were not sufficient for a finer-grained scoring.

This PhD project relied heavily upon qualitative data, represented as qualitative excerpts in all articles. However, they have also been represented quantitatively in Article I, which traditionally is uncommon for qualitative research (Silverman, 2006). Qualitative researchers have denied the usefulness of measurement, based on the belief that qualitative data are naturally occurring data, not susceptible to measurement (Hammersley, 2008, p. 32). However, qualitative researchers are nevertheless making claims (e.g., about frequency and degree) that are quantitative in character and it is thus impossible to do research well without measurements of some kind (Hammersley, 2008). We chose to represent the observation data as scores because the scoring of the data enabled us to see patterns across the programs. Furthermore, this kind of representation made it easier to spot the highlights of our findings, and it encouraged me to look at specific aspects more in depth, as was the case when I decided the focus for Articles II and III. The explicitness of the representation also forced me to revise my own assumptions and analyses of our data (Silverman, 2006), which enhanced the validity of my assumptions and conclusions. Finally, I would argue that this way of representing the data also facilitates communication with the public, as it makes it easier for the reader to get an overall impression of our findings (Nespor, 2006).

Our conceptual framework constituted the bases of this thesis, but was primarily used as an analytical framework in Article I. In Articles II and III, we used slightly different approaches for examining the same dataset. In these articles, I looked at two of the dimensions grounded in practice (i.e., *talk about field placement* and *analyze pupils' learning*). The analysis was less theory-driven, and the categories partly evolved from the empirical data. In Article II, we found that the framework by Little and Horn (2007) closely resembled our data. This framework examined in-service teachers' talk at the workplace, and was adapted to our context of pre-service teacher education. In Article III, we investigated the same dataset with an even more inductive approach, letting the empirical data reveal the categories it entailed, through a thematic analysis. These categories were supported by existing research (e.g., Thompson et al., 2013).

4.4.2 Analysis of survey data

To analyze the survey data in Articles II and III, we checked per item whether the variances of the programs (Stanford, Oslo, and Helsinki) were similar using Levene's test (Field, 2009). This was the case for all three items in Article III ($p > .05$), giving us the opportunity to

compare the three programs through a regular ANOVA. In Article II, Levene's test showed that variances were not equally distributed in the case of item 2E, and we therefore used Welch F for the overall comparison and Games-Howell as a post-Hoc test. We replaced missing data with the series mean (Dong & Peng, 2013). Missing value analysis indicated that none of the items had 5% or more missing cases. Variable 1c had the highest percentage of missing data (1.5%), and items 1g and 1i had the lowest percentage (.4%).

4.5 Research Credibility

4.5.1 Validity

My findings are based upon inferences drawn from the data, and the validity of these inferences defines the quality of my work (Creswell, 2013; Hammersley, 2008; Tucker, Viswanathan, & Walford, 2010). Many of my inferences from the empirical data were based on the concept "opportunities to learn that are grounded in practice". The eight dimensions describe certain indicators of this concept (Lund, 2005) and serve as an operationalization of an unobservable concept (Ary et al., 2010). My inferences thus relied on the *construct validity* of this concept, whether or not it measured what it was intended to measure (Hammersley, 2010; Kleven, 2008; Tucker et al., 2010). This theoretically driven categorization through the eight dimensions might be seen as *reductionist* (Blikstad-Balas, 2016; Snell, 2011), because the context of the teacher education coursework across six programs is reduced to eight codes. The problem of reductionism has been discussed in relation to how the use of video data might reduce the complexity of the classroom too extensively (Blikstad-Balas, 2016; Gall, Gall, & Borg, 2007; Snell, 2011). Even though I do not use video data in my study, one might ask whether the use of eight codes constraints what we identify as our findings. The cross-cultural aspect of this research project presents additional challenges in this respect, as context might then play an even more vital role (Blömeke & Paine, 2008). However, codes allow us to compare classrooms and get an overview of the data as well as find patterns across these contexts through a rigorous and systematic analysis (Blikstad-Balas, 2016; Snell, 2011). Additionally, the use of codes across the data can be complemented with nuanced micro-analysis of specific segments of the data (Blikstad-Balas, 2016; Snell, 2011), as I have done especially in Articles II and III.

The challenge of reductionism relates to the description of the "nature of" qualitative data. Qualitative research is often associated with an inductive approach, where theories are developed based on empirical data; in other words, research "proceeds from data to theory or

interpretation" (Ary et al., 2010, p. 452). One might argue that, because of its nature, qualitative research should start from the data, rather than from a hypothesis or a conceptual framework like ours (Hammersley, 2008). However, because it is impossible to do research without prior assumptions, any observation is theory-laden to some extent (Hanson, 1958; Kvale & Brinkmann, 2009; Silverman, 2006). Therefore, an important question is the degree to which an open and inductive research approach is indeed so. Hammersley (2010) argued that categorizations consist of concepts derived from literature on previous research (theory), ordinary experience of the world, or through the process of abduction, and will never be totally derived from the data. Openness around where these categories come from is therefore important, no matter the research approach. Some have criticized the traditional qualitative research approach for not being explicit enough about methods used, data collection, operationalizations, and categorizations (Hammersley, 2008, 2010; Silverman, 2006). Even though the use of theoretically driven categorization presents a challenge with reductionism, it is also a way to make the research more transparent and explicit (Creswell, 2013).

Indeed, research implies reducing complexity and systematizing the real world to some extent, but discussions about limitations of this reduction is important. Overall, our categories have been considered through rational assessment and empirical inquiry (Hammersley, 2010; Kleven, 2008). For instance, although we were interested in the dimension *plan for teaching*, lectures about planning (e.g., about learning goals or generative questions) were not included in our description of the dimension and were therefore excluded from our analysis. We wanted to capture the instances where the candidates had opportunities to actually plan for teaching, not only to learn about planning for teaching. Further, after a pilot study, we revised our framework by adding dimension eight to include national and state context and curriculum. During the main analysis, I looked for instances that 'fit' with the dimensions we had identified as well as experiences that did not reflect the dimensions, and we altered the descriptions of the dimensions to ground them in empirical evidence (cf. Darling-Hammond et al., 2010). This led to rounds of re-analysis of the data. For example, we encountered a situation where one course scored low on all dimensions. We re-examined these observation notes to identify other dimensions that could have led to a modification of our analytical framework. We found that this course was characterized by a teacher-lead classroom discussion based on a prepared lecture on subject didactical theory displayed on PowerPoint, evidence that did not encourage us to develop new dimensions in our framework.

In addition to examining construct validity and reductionism, we can employ several validation strategies to enhance the quality of qualitative research (Creswell, 2013). One

common strategy is *triangulation*, which I have used in different ways. First, this thesis consists of multiple cases that I looked across to strengthen or weaken the findings. Second, the study drew from multiple data sources, I used survey data in Articles II and III to support my analysis. In Article I, the findings were corroborated by findings in other publications within the CATE study, building on other data sources. Third, I used the same analytical framework to look across these data sources. The scoring of the dimensions in Article I led to the focus dimensions in Articles II and III.

Member checks can also enhance validity of research findings (Creswell, 2013; Hammersley, 2010). Representatives from five of the six programs offered feedback on presentations of findings and on drafts of the articles in this thesis. For example, I discussed my early findings with faculty at UCSB and Stanford. Similarly, we presented these findings to our informants and additional faculty in Oslo on several occasions, and we engaged in new rounds of data collection to continue the development of the program.

Finally, we have subjected research instruments, methodology, and article drafts to *expert validation* and *peer reviews* in formal and informal situations, such as conferences, research groups, journal reviews, and the national graduate school of education. My research has also been subject to institutionalized *external audits* throughout the process of my thesis (Creswell, 2013; Hammersley, 2010).

Summarizing, in this chapter, I have referenced the aims of the study to be transparent about the quality of the methodological choices I have made, as validity addresses whether the methods used are suitable to answer the research questions (Creswell, 2013). I believe this transparency conveys that the validity of my inferences should be satisfactory. It is important to take the exploratory nature of this study into account, as the framework and instruments used within this study are under development, and this study serves as a first step in trying out these measures. I relate the validity of this study to the reliability measures in the following.

4.5.2 Reliability

Throughout this thesis, I have offered transparent, detailed information on my research, which is important for the ability to replicate research and to strengthen the reliability and validity of my findings (Creswell, 2013). As discussed above, the definitions of the dimensions in our conceptual framework are of importance. Additionally, the scores in this study were based upon the coding book developed within the CATE study. Such an instrument can be subject to random measurement errors, which is a threat to the measurement's *reliability* (Cronbach, 1975). We thus conducted double coding of 8.7% of our data material to calibrate the scoring.

The strength of agreement was "good" (Fleiss, Levin, & Paik, 2003), with Kappa = 0.66. After inter-rater reliability was established, the first author coded all lessons and picked excerpts from the data to illustrate the characteristics of a higher score of the dimensions.

Kappa might be lower than desired, since Kappa increases with an increasing number of codes (Bakeman & Quera, 2011). The unit of our score was the whole lesson, and each dimension has received only 3–6 scores in each subject. For this reason, we did not report the Kappa of the individual dimensions. Additionally, a more systematic approach to the double-coding process might have contributed to a stronger Kappa. The two coders discussed how to understand the dimensions and the scores before the first round of scoring. After that first round, the coders continued these conversations to calibrate the scores. I completed the coding of all the data included in this study. Kappa, however, represents the first round of coding; due to time constraints, a second round of double coding was not conducted. One might expect that the inter-rater reliability would have resulted in a higher Kappa at this second stage and that the coding is thus of higher reliability than the initial Kappa expressed. Further, as one researcher did all coding, the internal consistency should be high. I coded the material several times to increase the *stability* of the coding and the scoring (Church, 2010). For instance, I scored the data again when our understanding of the dimension *take the pupils' perspective* changed and when I found new empirical evidence in a program that made me refine the score description on one dimension. Furthermore, the scores and codes were subjected to member checks, peer review, and expert validation (Creswell, 2013; Hammersley, 2010). Finally, the development of the coding book was a first step in developing a sustainable instrument for research on teacher education. Further research is necessary before this instrument is robust enough for upscale use. In that respect, the use of audio- or video-data to capture details in real-time talk and actual timing of events would be advantageous.

Another aspect of reliability is the process of data collection. We had several research assistants collecting the data across nations and cultural contexts. I already addressed the challenges with equivalence in comparative research (Raivola, 1985), and one might question whether the research assistants and informants understood the framework and the survey in the exact same way (cf. Dalland, 2011; Walliman, 2011 for a discussion on authentication and credibility). All five research assistants collecting data had undergone common training by the CATE team, and we were using the same instruments, developed within the CATE study and adjusted to the different national contexts. For instance, the survey was translated and back translated (Blömeke & Paine, 2008). In addition, the research assistants collaborated closely with the CATE team, resulting in careful discussions about how to understand different

aspects of the data to be collected across all contexts (e.g., how to estimate the hours of practice across the programs). Finally, the CATE team evaluated the data at the end of the collection period to ensure the data were suitable for the study purposes. This resulted in a new data collection at one site, and a re-check with research assistants at another.

4.5.3 Generalization

Some researchers view qualitative research as purely descriptive, interested in the very particular cases. Thus, qualitative research risks becoming too context-bound and too specific, so that generalizations or comparisons are not possible (Hammersley, 2010). Shadish, Cook, and Campbell (2002) emphasized that researchers using case-methodology often do not dare to generalize; if they do, they are easily accused of being biased towards their favorite case. Stake (2006) noted that multiple-case studies can guide policy for cases like those studied or that knowledge about the cases can be transferred to other cases.

Sampling is important when it comes to external validity, and as previously stated, purposive modes of sampling are necessary in case-study approaches (Stake, 2006). The strongest generalizations can be made by "most similar" cases that are broadly representative of their population (Flyvbjerg, 2006). Hence, the extent to which our six teacher education programs are representative of all teacher education programs worldwide, or the extent to which each is representative of its region, determines the extent to which we can generalize our findings. We sampled programs that were assumed to have paid attention to teacher education efforts, but they were not "most similar" cases in a strict sense. One should therefore be careful when using the findings of this thesis to make generalizations about the current state of teacher education in general or in the three nations in our sample. However, certain characteristics of my research design are worth mentioning when discussing the generalizability of the results. The cases share characteristics, but also display a variety across contexts. According to Stake (2006), this multiple-case approach generates specific ways of drawing conclusions. Unusual situations or findings across the cases limit the generalizability of the answers to the research questions whereas typical situations across the cases contribute to the descriptions in the conclusions. In that sense, Eisenhardt and Graebner (2007) argued that a multiple-case approach can contribute to theory-building to a greater extent than can a single case study. In that respect, it is important that we have provided systematic and transparent descriptions of the cases in our sample, so that the readers can decide whether the findings are transferrable to their own context (Creswell, 2013; Stake, 2006).

Additionally, Silverman (2006, p. 249) argued that social science should not necessarily copy research designs that enable generalizations, but that we should rather see our findings as context-bound and contrast them to generalizations of these findings. Yin (1994) emphasized that case-study research relies on analytical generalizations, where one generalizes the results from cases to a broader theory. Our context-bound findings about opportunities grounded in practice in teacher education coursework could provide temporary generalizations, working hypotheses rather than conclusions, which could be the starting point for further investigations in other contexts. Thus, our findings might contribute to theory-building around practice-based teacher education, contributing to knowledge about what good teacher education might look like, of use for policymakers and others.

4.6 Ethical Considerations

4.6.1 Confidentiality and informed consent

The Norwegian Social Science Data Services (NSD)[10] approved this study. All data were uploaded to and stored in a locked wiki, making it available only to researchers involved in the CATE study. The Norwegian Personal Data Act (2000) and the Guidelines for Research Ethics in the Social Sciences, Law and the Humanities (National Committees for Research Ethics in Norway [NESH], 2010) regulated my informants' confidentiality. The teacher education programs were named in this extended abstract, because the context descriptions with belonging references nevertheless disclosed their identity. Certain information might thus be tracked to a single person within the individual program. I have thus used *informed consent* to protect my informants' right to privacy (Sieber, 1992, p. 44), which is the common way to take privacy protection into account in Norway (Sieber, 1992) and in the other countries participating in the study. Guidelines for informed consent differ slightly between the countries, which has been considered while developing the relevant forms.

4.6.2 The insider perspective

Even though the consent forms state that participation is voluntary, I have been employed at one of the teacher education programs for 10 years, and my research is partly *practitioner* research (cf. Borko et al., 2007). I am in professional relationships characterized by varying degrees of power with some of my informants, and the questions of voluntary or free consent are important (Sieber, 1992, p. 26). As a researcher in this relationship, I was aware that my informants might have difficulties in refusing to participate.

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10 See www.nsd.uib.no/nsd/english/index.html

Further, as an insider I might not be able to see things that would be obvious to a researcher with an outsider perspective, or I might emphasize aspects I appreciate in "my own" program in my analysis (Atkins & Wallace, 2012; Kvernbekk, 2005; Sieber, 1992). As this affects the validity of my findings, I have strived to provide thick descriptions of my cases as well as thorough methodological and theoretical overviews to be transparent on biases I might have (Creswell, 2013). I have also made sure to present and discuss my findings with outsiders to the setting where I have done my research (Creswell, 2013).

4.7   Methodological Limitations

The observations in this study were undertaken within a limited period of the academic year and within a limited part of the teacher education programs. We sought to diminish this threat by consulting with representatives of the programs (our research assistants and the program leaders) about the timing of the three weeks of observations and which courses we ought to observe. I also reminded myself to consider contextual aspects of the courses and teacher education programs as well as the cultural contexts while drawing my conclusions. Additionally, triangulation with the survey data gave us more information about the teacher candidates' experiences across the whole year. Finally, since we know little about what characterizes the opportunities grounded in practice within teacher education coursework, I chose to look across cases. This meant I had to narrow my scope and focus on certain courses, and I had to observe these in a limited amount of time. This approach caused some methodological challenges, but it should be seen as a first step of exploring these opportunities grounded in practice, in ways that have been asked for in the research literature (Cochran-Smith et al., 2016). It is also important that these limitations would be of much more importance if we were to evaluate the teacher education programs. My intention was rather to provide a rich and broad picture of what the phenomenon of opportunities grounded in practice within teacher education coursework might look like.

4.8   Short Summary and Comment to the Analysis

Table 7 summarizes the details of the research design.

Table 7. *Research design across articles*

Article	I	II	III
Methods	Qualitative	Quantitative and qualitative	Quantitative and qualitative
No. of programs	6	3	3 (survey data) 6 (observation data)
Data	Observation data ($N = 104$ hours)	Survey ($n = 269$) and observation data ($n = 41.5$)	Survey ($n = 269$) and observation data ($N = 104$)

Credibility	Reliability:
	• Double-coding and re-coding of observation data
	  Triangulation:
	• Looking across cases
	• Same analytical framework used across cases. Results of scores in Article I influenced the choice of focus in Articles II and III
	• Results of scores from observation data was checked with other publications on the survey data from the same project
		Reliability:
		• Cronbach's alpha
		  Triangulation:
		• Looking across cases
		• Same analytical framework used across data sources and cases. Results of scores in Article I influenced the choice of focus
		• Survey data combined with observation data
			Reliability:
			• Cronbach's alpha
			  Triangulation:
			• Looking across cases
			• Same analytical framework used across data sources and cases. Results of scores in Article I influenced the choice of focus
			• Survey data combined with observation data

In hindsight, I see that my analysis resembled "Track II analysis" where the researcher highlights merged finding from across cases, notes from which cases they have support, and identifies which themes emerge from the merged finding (Stake, 2006, pp. 58-63). Even though I did not follow the systematic manner with worksheets as outlined by Stake (2006), I attended to the extent to which my findings were supported across all, or only a few, cases. Stake (2006) pointed to the importance of the dialectic between the phenomenon and the case (what he called the "case-quintain dialectic", pp. 39-40), meaning the researcher pays equal attention to the local case and the whole (i.e., the phenomenon under study) during analysis. I have tried to keep this in mind during the whole process with this thesis.

5 Summary and Discussion of the Articles

In this chapter, I begin by summarizing the three articles in this thesis, before I go on to discuss the overall contribution of this thesis and end with some concluding remarks.

5.1 Summary of the Articles

The aim of this thesis was to contribute to research on practice-based teacher education, specifically on teacher candidates' opportunities to learn that are grounded in practice within their coursework at campus. The overall research question asked: *To what extent and how is the coursework within these six teacher education programs grounded in practice?* This topic was investigated through three research topics, resulting in three articles, summarized in the following.

5.1.1 Article I

The first article is:

Jenset, I. S., Klette, K., & Hammerness, K. (accepted for publication). Grounding teacher education in practice around the world: An examination of teacher education coursework in teacher education programs in Finland, Norway, and the United States. *Journal of Teacher Education.*

Due to the continued criticism that teacher education is not connected to real classroom teaching, this first article aimed to get an overview *across* teacher education programs of the extensiveness and characteristics of the instructional practices that provide opportunities grounded in practice in teacher education coursework. We focused on the research question: *In what ways is candidates' coursework grounded in practice across programs in different national settings?*

    The article relied on a multi-site design with a sample of six teacher education programs from Norway, Finland, and California (US)—all interesting sites for teacher education, as highlighted in the methods section in this extended abstract. To unpack the instructional practices of teacher education, we analyzed observation data ($N = 104$ hours) from the methods courses of language arts and mathematics within these programs, due to a belief that these were the courses where one could expect opportunities to enact practice to occur. Trained research assistants and I conducted the observations and took typed, running notes at each site.

Relying on the analytical framework developed within the CATE study, the analysis in this article focused on all eight dimensions of opportunities grounded in practice included in this framework: *plan for teaching and teacher role(s)*; *practice and rehearse teaching and teacher role(s)*; *analyze pupils' learning*; *include teaching materials, artifacts, and resources*; *talk about field placement*; *take the pupils' perspective; see models of teaching*; and *see connection to national or state curriculum.* The opportunities to learn across these dimensions were further analyzed through a coding book developed within the CATE study. The coding book captured the overall frequency and duration of the dimensions, as well as their quality, based on scores on a scale from 1 to 4.

We found a tendency for candidates across these programs to have quite extensive opportunities to engage in certain practices, such as to *include teaching materials* or to *take the pupils' perspective*. However, they had far fewer opportunities to engage in practices such as to *analyze pupils' learning*, to *see models of teaching*, or to *practice and rehearse teaching*. In the article, we pointed to this pattern of opportunities across the programs, and we also gave illustrative examples of what these different opportunities grounded in practice looked like.

Based on these findings, we argued that this pattern illustrates aspects of grounding teacher education coursework in practice that are more established while others are less developed. We pointed specifically to *analysis of pupils' learning* as one area that was less developed and in need of attention. Finally, we emphasized differences across the programs and areas for development across contexts.

5.1.2 Article II

The second article is under review at *Scandinavian Journal of Educational Research*:

Jenset, I. S., Hammerness, K., & Klette, K. (2016). Talk about field placement within coursework at campus: Grounding teacher education in practice. Manuscript submitted for publication.

This article highlighted research arguing that field placement experiences are critical and valued experiences in teacher education, but that these experiences should be scaffolded and elaborated more systematically. In the first article, we found that the teacher candidates had relatively frequent opportunities to talk about their field placement experiences when returning to their coursework, which was one of the eight dimensions examined in Article I. The aim of this second article was therefore to focus on this dimension explicitly, by examining how the coursework at campus functioned as a site for scaffolding the talk about field placement. The research questions were as follows: (a) *What characterizes the opportunities teacher*

candidates have to talk about field placement within their coursework at campus? and (b) *How do candidates perceive these opportunities across and between programs?*

In this article, the sample was three of the six programs in the overall sample, one from each of the three countries. The article reported on observation data ($n = 52$ hours), as well as survey data tapping specific items related to *talk about field placement* and opportunities to connect coursework and fieldwork ($n = 269$ candidates). We used Levene's test (Field, 2009) to investigate the extent to which candidates perceived to have the opportunity to *talk about field placement* across the three programs. Levene's test showed that variances were not equally distributed in one of the items. We therefore used Welch F for the overall comparison across the three programs, and Games-Howell as a post-hoc test. The observation data were analyzed using an analytical framework developed for capturing teachers' talk at the workplace (Little & Horn, 2007), also relevant for analyzing teacher candidates' talk within coursework. This framework included the categories *normalization* (with sub-categories (a) *emotional support* and (b) *superficial and simplified talk*), *specification* (with sub-categories (a) *detailed*, (b) *sustained*, and (c) *complex talk*), and *generalization* (with sub-categories (a) *making connections from practice to theory* and (b) *making connections from theory to practice*), which allowed us to analyze the characteristics of this talk and the extent to which it connected fieldwork and coursework.

The results from the survey data in this article showed that the teacher candidates in these three programs reported that they had quite similar opportunities to *talk about field placement*, but that the programs differed regarding how closely this talk was related to theory. The candidates from Stanford reported they had more opportunities to connect their talk to theory than those at the two other programs. This suggested we should examine more closely what characterized the talk at the different sites. Our findings from the observation data confirmed the findings from the survey data. Overall, we found many instances of *talk about field placement*; however, in two of the programs, this talk was mainly categorized by *normalization*, or superficial and simplified talk about teaching and learning. We therefore pointed to the huge differences between the programs and argued that the talk at Stanford was more detailed, sustained, and complex (*specification*) than that at the others. At Stanford, the talk was also more often linked to theoretical concepts (*generalization*).

In the article, we discussed the critical role of all categories of *talk about field placement* (i.e., normalization, specification, and generalization). However, we concluded that there is a need for a more targeted pedagogy of teacher education, where conscious choices are being made as to when and how experiences from field placement should be talked about and

processed. We also discussed relevant differences in program size and organization of practice, and how this might influence the quality of the talk about field experiences. We emphasized that the concurrent versus interval based organization of field placement seemed to have huge implications for the quality of the conversation when candidates talk about their field experience.

5.1.3 Article III

The third and last article is in review at *European Journal of Teacher Education*:

Jenset, I. S., Canrinus, E. T., Klette, K., & Hammerness, K. (2016). From a focus on teaching to a focus on learning in teacher education: Opportunities to analyze pupils' learning within coursework at campus. Manuscript submitted for publication.

In this article, we argued that pupils' learning is at the core of what teaching and thus teacher education is about, and that this should be highlighted during coursework at campus. In Article I, we found that the teacher candidates had scarce opportunities to *analyze pupils' learning*. In Article III, we investigated this dimension explicitly, examining what characterized the few instances that we found of these opportunities. The research questions in focus were: (a) *What characterizes the opportunities the teacher candidates have to analyze pupils' learning within their coursework at campus?* and (b) *How do candidates perceive these opportunities across and between programs?*

This article reported on survey data tapping specific items related to analysis of pupils' learning ($n = 263$ candidates) at three programs, as well as observation data on the same ($N = 104$ hours) at six programs. We used descriptive statistics and analysis of variance (ANOVA) to investigate the extent to which candidates perceived they had the opportunity to *analyze pupils' learning* and to compare the three programs. The observation data were analyzed using an inductive approach, open for the categories that emerged from the data, and corroborated by categories identified in existing research.

In this article, we found that the teacher candidates across the three programs reported in the survey data that they had few opportunities to look at pupils' work, or to watch and analyze videos or transcripts of classroom interactions. This was confirmed in the observation data, where we found very few instances where the teacher candidates had opportunities to *analyze pupils' learning*. We shared illustrative examples of different types of opportunities to *analyze pupils' learning* that could initiate a discussion about the implications for teacher education instructional practices.

The article concluded that there is a need to focus more explicitly and more in depth on pupils' learning in teacher education. We argued that a pedagogy of teacher education might profit from existing research on elicitation of pupils' learning (Windschitl et al., 2012) and carefully model and scaffold this work for the teacher candidates.

5.2 Discussion of the Research Contribution

In this section, I summarize my research contribution with respect to its (a) theoretical contribution, (b) empirical contribution, and (c) methodological contribution. I will refer to the articles, the research questions, and my theoretical and conceptual framework, as well as previous research, whenever appropriate.

5.2.1 Theoretical contribution

The research questions of this thesis focused on opportunities to learn that are grounded in practice within the candidates' coursework at campus. The term *practice-based teacher education* thus became important to investigate and clarify. As already stated, teacher education has been criticized for being too fragmented and disconnected to real classroom teaching practice (Darling-Hammond, Bransford, et al., 2005; OECD, 2005). While rhetorically strong (Blikstad-Balas, 2013), the urge for more practice-based teacher education is seldom specified or concretized (Forzani, 2014), leading to the question: what does it mean to be practice-based, to connect to practice, or to connect theory and practice? A theoretical contribution of this thesis is the clarification of how to understand these terms in the context of teacher education coursework.

This was done through systematizing existing research on connecting to practice in teacher education, resulting in four theoretical approaches to a practice-based teacher education, as outlined in Chapter 2. Through this systematization, I have highlighted different strands of influence for a practice-based teacher education and made evident different aspects people might infer in the notion of a practice-based teacher education. I have pointed to recent movements towards the enactment approach to a practice-based teacher education, and I have showed how this approach builds upon and incorporates aspects of the other approaches, such as the expertise approach and the reflective approach. As such, I have provided a ground for understanding the enactment approach and its origins. Second, the eight dimensions of opportunities grounded in practice within the conceptual framework for this thesis (see Article I and Chapter 3) constitute a further decomposition of the term *practice* in the concept of a practice-based teacher education. The term *practice* in practice-based teacher education cannot

be reduced to field placement and practice in schools and classrooms. As in the three articles, I argue that teacher educators at the campus site of teacher education can *connect* to practice, or help their teacher candidates *enact* practice, in different ways. The decomposition in eight dimensions (e.g., our conceptual framework) represents a first step towards unpacking the characteristics of instructional practices of teacher education that are grounded in practice.

Relatedly, I have argued that I placed this study within the enactment approach to a practice-based teacher education. Although some dimensions in our framework (e.g., *see connection to national or state curriculum*) build on research representing a broader perspective to a practice-based teacher education, it has been important to me to highlight the enactment approach as a new approach to practice-based teacher education and to frame my study within the rationale of this approach. This is due to this approach's explicit focus on the campus site of teacher education, not leaving opportunities to learn that are grounded in practice to fieldwork alone. By framing it within this approach, I also contribute to the requested empirical research within this approach, as pointed to in the literature review in Chapter 3. As such, my explicit choice of framing my study within the enactment approach highlights its contribution to the theoretical understanding of what practice-based coursework might entail.

A further theoretical contribution enabled by the systematization of the term *practice* in the concept of practice-based teacher education is the explicit focus on pupils' learning in our conceptual framework. The theoretical approaches to a practice-based teacher education, outlined in Chapter 2, emphasize the teacher or the teacher candidate and their teaching, rather than the learning of the pupils as central. However, all theories about teachers and teacher development have pupils' learning as one of the ultimate goals. One implication of my study could therefore be to explicitly highlight pupils' learning as critical for a pedagogy for teacher education (McDonald et al., 2013).

Finally, and as argued in Chapter 3, the status of theory in the enactment approach to a practice-based teacher education is somewhat vague and unclear. While designing the coding book, it was therefore important to clarify the role of theory within the opportunities to learn that were grounded in practice. As explained in the methods section (4.4.1), even though the coding book was designed to measure the degree of opportunities grounded in practice, the highest level (score 4) also included ways of *connecting to theory* when scoring opportunities grounded in practice. This was also evident in Article II, where the more generative *talk about field placement* was also the talk that connected to pedagogical theories and principles. As outlined in Chapter 2, the role of theory is more evident in the reflective approach to a

practice-based teacher education; as such, a theoretical contribution of this thesis is to make the role of theory more explicit also in an enactment approach to a practice-based teacher education.

5.2.2 Empirical contribution

This thesis has contributed with empirical knowledge about the extent and characteristics of the opportunities teacher candidates have that are grounded in practice within their coursework at campus, as highlighted in the research questions. The literature review in Chapter 3 revealed a need for this type of knowledge (see also Cochran-Smith et al., 2016). For instance, van Veen (2013) argued that instructional practices of teacher education, such as reflection and the use of portfolios, are "hardly explored in terms of effectiveness" (p. 29). This thesis to some extent corroborates earlier knowledge about the scarcity of connections to practice in teacher education coursework (Darling-Hammond, 2006), but it has also shown that teacher candidates *do* have opportunities to learn that are grounded in practice. More specifically, based on the decomposition of opportunities to learn that are grounded in practice outlined throughout our conceptual framework, this thesis has contributed with more detailed knowledge about the characteristics of these opportunities, as well as their strengths and weaknesses across the programs in our sample. This thesis has shown, primarily through Article 1, that the more established ways of grounding in practice (e.g., *taking the pupils' perspective*) are used more frequently in coursework; significantly, these instructional practices point back to the seminar tradition in the Nordic countries (Kvalbein, 2003; Rasmussen, 2008). The candidates had, however, rather few opportunities connected directly to routine classroom teaching practices, such as to *practice and rehearse teaching*, *analyze pupils' learning*, and *see models of teaching*. Even though the observations covered a limited part of the complete programs, the emergence of similar patterns across the programs strengthened these findings. Further, these findings were corroborated by survey data measuring the candidates' perceptions across the whole program as well as the whole academic year (Canrinus, Bergem, Klette, & Hammerness, 2016). Thus, while discussing the everlasting challenge of making teacher education relevant for actual classroom practice, this thesis has contributed with empirical knowledge reminding us that this can be done with relative emphasis on specific aspects of practice.

Second, and related to the last part of the overall research question, this thesis has also contributed to empirical knowledge about the quality and characteristics of the different dimensions of opportunities to learn that are grounded in practice and included in our

framework. As argued in Chapter 3, many of the reviewed studies have noted the importance of the careful scaffolding and support by the teacher educators when employing these practices, and this thesis contributes with specific knowledge about what this support might entail. In particular, Articles II and III specified this in detail for the two chosen dimensions, *talk about field placement* and *analysis of pupils' learning*. In addition, the use of the coding book in Article I, together with analysis of the dimensions across all three articles, have shown that, even though there are opportunities grounded in practice in coursework, some opportunities are more rigorous and developed than others. For instance, in Articles II and III, we showed how *talk about field placement* and the *analysis of pupils' learning* are opportunities grounded in practice that have great potential, but that suffer from lack of detail, specificity, and connectedness to theory. We have argued that this talk could be more complex and analytic, and that the analysis of pupils' learning could also be done more in depth and according to research on how to make learning visible. Again, this is related to a pedagogy of teacher education, the quality of the instructional practices of the teacher educators, and the scaffolding and support provided. Seeing teaching as a complex activity that needs to be decomposed, approximated, and rehearsed (cf. Forzani, 2014) invokes the emphasis on the role of the teacher educators and their instructional practices.

Finally, it is also interesting to look at the empirical contribution concerning differences between the programs in our sample. Since the observation data constituted a small slice of the overall teaching on campus within these programs, I do not make overall claims about the individual programs in Article I. In Article II, however, I showed how the opportunities to *talk about field placement* at Stanford were perceived as greater by the teacher candidates, but also that the talk there was more frequent and performed with greater quality than at the two other programs, partly due to the teacher educators' instructional practices. I chose to highlight Stanford in this article because it seemed like something could be learned from the *atypical* finding (cf. Stake, 2006) from this program. The finding was triangulated by survey data, which accentuated the argument of highlighting Stanford related to that specific dimension. Similarly, in Article III, I found that the candidates in the Helsinki program perceived less opportunity to *analyze pupils' learning* than candidates from the other two programs, even though all candidates perceived few opportunities. The survey data included reports from only the programs for which we had robust survey data (Oslo, Helsinki, and Stanford), and the differences discussed below thus apply only to those three programs. In Article II, I questioned whether the differences found had to do not only with the size of the programs— Stanford being smaller, having more time and resources to follow up the individual

candidates—but also if they had to do with the organization of field placement and the connectedness between the teacher educators at the school site and the field placement site within this program. Stanford was the only program of these three that had organized its field placement concurrently with the teaching at campus. One might think that this had an impact on the extent to which *talk about field placement* was connected to, or grounded in, practice. In Article III, I pointed to variation in reform efforts as a way to explain differences across programs, as both Stanford (Hammerness, 2006) and Oslo (Engelien et al., 2015) have emphasized ways of grounding coursework in practice in their fairly recent reforms, whereas this was not the case for Helsinki.

Finnish scholars have argued that there are close connections between fieldwork and coursework in Finnish teacher education due to arrangements such as the training schools and teacher educators with split positions in these schools and at campus (Niemi & Jakku-Sihvonen, 2006; Niemi & Kohonen, 1995; Tirri, 2014). However, a professional struggle in Finland (Niemi, 2016), as well as in Norway (Munthe & Rogne, 2016), has led teacher education to aim for recognition by moving away from the traditional seminar into the more academic tradition of the university. This academization of teacher education might have resulted in a less practical teacher education due to a fear of being too instrumental and technical (Munthe & Rogne, 2016; Niemi, 2016). Research from Finland has shown that the explicit focus on research in Finnish teacher education might have undermined a focus on the more practical skills (Groom & Maunonen-Eskelinen, 2006; Säntti, Rantala, Salminen, & Hansen, 2014). Säntti et al. (2014) showed that the amount of practice and the amount of tutoring during practice has deteriorated from 1982 to 2006, and has been replaced by more self-studies. They argued that this makes the integration of theory and practice even more difficult for the teacher candidates. Groom and Maunonen-Eskelinen (2006) found that there was less focus on teaching skills in Finnish teacher candidates' portfolios, as compared to their UK peers. Similarly, while comparing teacher education at the University of Helsinki and at Oslo University College, Afdal and Nerland (2014) concluded that the Helsinki program was more closely connected to theory while the Oslo University College program was more closely connected to practice. There is no doubt that the Finnish version of research-based teacher education represents a strong model for a practice-based teacher education, but perhaps the "general level" in Finnish teacher education has been overemphasized at the cost of the "basic level," as Kansanen (1991, 2004) framed it.

As stated, experts have issued a critique about teacher education being disconnected from practice in Norway (NOKUT, 2006) and in the US (Darling-Hammond, Bransford, et al., 2005)

as well. However, the US discourse has included a push for what I have called the enactment approach to a practice-based teacher education, and the Californian programs included in this thesis are examples of programs taking this approach into account. Similarly, from the contextual descriptions of programs outlined in the introduction and in the methods section, it seems that Oslo has worked specifically on connection to practice and the enactment of practice, while the same was not as evident in Helsinki, which might help explain the differences we found between the programs.

5.2.3 Methodological contribution

Research on teacher education has been characterized as a new and immature field (McNamee & Bridges, 2002). A central limitation of research on teacher education is the lack of shared conceptual frameworks and designs across such studies (Borko et al., 2007; Grossman & McDonald, 2008; Zeichner, 2005). To move the field of research on teacher education forward, one needs to develop a common agenda, shared methodological tools, and a mutual understanding of terms in the field (Borko et al., 2007; Grossman & McDonald, 2008; Hammersley, 2010; Zeichner, 2005). Borko et al. (2007) argued that research programs should be developed for researchers to build on each other's work, to pursue a line of inquiry, and to use more common tools for data collection methods and analysis.

Most prior research on practice-based teacher education has been conducted as small case studies, and researchers have requested studies *across* programs (Cochran-Smith et al., 2016; Grossman & McDonald, 2008). As this PhD project was designed as a multiple-case study, looking across data sources and across cases, developments of common instruments were necessary. The thesis thus made methodological contributions in the development and testing of our analytical framework, as well as the coding book. To pursue a line of inquiry, the instruments have built on existing instruments and research (Borko et al., 2007; Hammersley, 2010; Zeichner, 2005). As such, these instruments help accumulate knowledge and open up for further refinement and analysis (Borko et al., 2007; Hammerness & Klette, 2015). However, the exploratory character of this study implies that the conceptual and analytical framework should be calibrated and developed further. Additionally, the instruments can be adapted and used across contexts, or longitudinally, and in that way contribute to building a stronger, shared knowledge base for ways of understanding how teacher education programs can be grounded in practice (Hammerness & Klette, 2015). In fact, the survey instrument has already traveled to other contexts and institutions (e.g., Malaysia, Estonia, Cuba, the Netherlands), and the observation coding book has been used in Chile.

5.3 Concluding Remarks: Need for Further Research and Implications for Teacher Education

In this thesis, I have examined the extent and characteristics of the opportunities teacher candidates have to learn that are grounded in practice during their coursework at campus. I have pointed to empirical evidence about frequency and quality of these opportunities, as well as the instructional practices connected to them. I have also shown how the work with this thesis could contribute theoretically and methodologically in the continued investigation of these opportunities. I have pointed to the need for further, more detailed, and finer-grained research on opportunities grounded in practice within the coursework at campus, as well as outcome measures targeted to this purpose. This thesis has thus corroborated the review by Cochran-Smith et al. (2016) in this respect. Additionally, my research has highlighted a need for further research on how the organization of field placement impacts practice-based opportunities to learn or, more specifically, the candidates' opportunities to *talk about field placement*, as there are indications in my material that this might be of significance. Programs with field placement organized concurrently may represent a closer relationship to teaching practice, which might enhance candidates' opportunities to make connections to practice. Finally, further examinations of models of a practice-based teacher education across contexts, and their impact on the instructional practices of teacher education are called upon. As policymakers look to Finland and highlight their model of teacher education, it is of great interest how this model influences the understanding of a practice-based teacher education.

In this regard, my thesis holds important implications for teacher education. It shows that the instructional practices of teacher education (e.g., methods courses) play a vital role in grounding teacher education in practice. Although not the focus of this study, across my articles, I have continuously argued that teacher educators need to work systematically to engage in instructional practices that create opportunities grounded in practice for teacher candidates within their coursework at campus. This argument is in line with Ball and Cohen (1999), who asserted that, even if there would exist a curriculum of teacher education, a collection of artifacts from practice, these do not result in professional learning in and of itself. The changes needed are so fundamental that professional development for teacher educators is needed (Ball & Cohen, 1999). Perhaps teacher educators have the knowledge and skills to perform K-12 classroom discourses and to assess and analyze pupils' learning; in other words, perhaps they know their pedagogical content knowledge or their subject didactics. Nevertheless, conveying this knowledge and skills to teacher candidates, by giving them

opportunities to *talk about their field placement* or opportunities to *analyze pupils' learning*, is something else. That has to do with the knowledge and skills needed to be a teacher educator, with the transition from being a teacher to becoming a teacher educator (Loughran, 2014), and with what constitutes the knowledge base for teacher educators (van Veen, 2013). This seems to be an under-developed area. There is little research investigating how teacher educators are prepared to educate teachers (Grossman, 2013), and few countries have designated programs or educational courses for becoming a teacher educator (van Veen, 2013). Teacher educators need more knowledge about aspects of instruction in teacher education in order to know how and what to work on when they are trying to connect their teaching to actual classroom practice. The knowledge about instructional practices for teacher education derived from this thesis may add to the work on creating a common language and a common ground for teacher educators when developing a community of teacher education practice (cf. McDonald et al., 2013).

Thus, the findings of this thesis can contribute to a discussion amongst teacher educators about how to develop instructional practices or pedagogies of teacher education that are grounded in practice. The instruments developed and used in this thesis can serve as a tool for program development, in terms of instructional practices at campus and how they could be developed to make connections to practice more explicit. The instruments can support teacher educators and directors of programs in their efforts to enhance the quality of their teacher education program and their own teaching. Moreover, I also urge policymakers to see the need for professional development amongst teacher educators to enhance the quality of teacher education, teachers, and schooling.

References

Adler, S. (1991). The reflective practitioner and the curriculum of teacher education. *Journal of Education for Teaching, 17*(2), 139–150. doi:10.1080/0260747910170203

Afdal, H. W. (2016). "Research-based" and "profession-oriented" as prominent knowledge discourses in curriculum restructuring of professional programs. *Higher Education*, 1–18. doi:10.1007/s10734-016-9998-7

Afdal, H. W., & Nerland, M. (2014). Does teacher education matter? An analysis of relations to knowledge among Norwegian and Finnish novice teachers. *Scandinavian Journal of Educational Research, 58*(3), 281–299. doi:10.1080/00313831.2012.726274

Ahtee, M., Juuti, K., Lavonen, J., & Suomela, L. (2011). Questions asked by primary student teachers about observations of a science demonstration. *European Journal of Teacher Education, 34*(3), 347–361. doi:10.1080/02619768.2011.565742

Anderson, L. M., & Stillman, J. A. (2013). Student teaching's contribution to preservice teacher development: A review of research focused on the preparation of teachers for urban and high-needs contexts. *Review of Educational Research, 83*(1), 3–69. doi:10.3102/0034654312468619

Andreassen, S.-E. (2015). Studenter og praksislærer sammen om aksjonslæring [Students and cooperating teachers doing action research together]. In U. Rindal, A. Lund, & R. Jakhelln (Eds.), *Veier til fremragende lærerutdanning* [Roads towards excellent teacher education] (pp. 87–98). Oslo, Norway: Universitetsforlaget.

Ary, D., Jacobs, L. C., & Sorensen, C. (2010). *Introduction to research in education*. Belmont, CA: Wadsworth Cengage Learning.

Atkins, L., & Wallace, S. (2012). *Qualitative research in education*. London, England: Sage.

Bailey, J., & Taylor, M. (2015). Experiencing a mathematical problem-solving teaching approach: Opportunities to identify ambitious teaching practices. *Mathematics Teacher Education and Development, 17*(2), 111–124. Retrieved from http://files.eric.ed.gov/fulltext/EJ1085902.pdf

Bakeman, R., & Quera, V. (2011). *Sequential analysis and observational methods for the behavioral sciences*. New York, NY: Cambridge University Press.

Ball, D. L., & Cohen, D. K. (1999). Developing practice, developing practitioners: Toward a practice-based theory of professional education. In G. Sykes & L. Darling-Hammond (Eds.), *Teaching as the learning profession: Handbook of policy and practice* (pp. 3–32). San Francisco, CA: Jossey Bass.

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

Ball, D. L., & Hill, H. C. (2009). Measuring teacher quality in practice. In D. H. Gitomer (Ed.), *Measurement issues and assessment for teaching quality* (pp. 80–98). Thousand Oaks, CA: Sage Publications.

Ball, D. L., Sleep, L., Boerst, T. A., & Bass, H. (2009). Combining the development of practice and the practice of development in teacher education. *The Elementary School Journal, 109*(5), 458–474. doi:10.1086/596996

Barnhart, T., & van Es, E. A. (2015). Studying teacher noticing: Examining the relationship among pre-service science teachers' ability to attend, analyze and respond to student thinking. *Teaching and Teacher Education, 45*, 83–93. doi:10.1016/j.tate.2014.09.005

Benner, P. (1983). Uncovering the Knowledge Embedded in Clinical Practice. *Image: the Journal of Nursing Scholarship, 15*(2), 36-41. doi:10.1111/j.1547-5069.1983.tb01353.x

Berliner, D. C. (1986). In pursuit of the expert pedagogue. *Educational Researcher, 15*(7), 5–13. Retrieved from https://www.jstor.org/stable/pdf/1175505.pdf

Berliner, D. C. (1988). The development of expertise in pedagogy. *AACTE Publications.* Retrieved from http://files.eric.ed.gov/fulltext/ED298122.pdf

Berliner, D. C. (1994). Expertise: The wonder of exemplary performances. In J. N. Mangieri & C. C. Block (Eds.), *Creating powerful thinking in teachers and students* (pp. 141–186). Fort Worth, TX: Rinehart and Winston.

Berliner, D. C. (2000). A personal response to those who bash teacher education. *Journal of Teacher Education, 51*(5), 358–371. doi:10.1177/0022487100051005004

Blikstad-Balas, M. (2013). Vague concepts in the educational sciences: Implications for researchers. *Scandinavian Journal of Educational Research, 58*(5), 528–539. doi:10.1080/00313831.2013.773558

Blikstad-Balas, M. (2016). Key challenges of using video when investigating social practices in education: Contextualization, magnification, and representation. *International Journal of Research & Method in Education*, 1–13. doi:10.1080/1743727X.2016.1181162

Blömeke, S., & Paine, L. (2008). Getting the fish out of the water: Considering benefits and problems of doing research on teacher education at an international level. *Teaching and Teacher Education, 24*(8), 2027–2037. doi:10.1016/j.tate.2008.05.006

Borko, H., Liston, D., & Whitcomb, J. (2007). Genres of empirical research in teacher education. *Journal of Teacher Education, 58* (1), 3–11. Retrieved from https://www.researchgate.net/publication/2200408477_Genres_of_empirical_research_in_teacher_education

Borko, H., & Putnam, R. T. (1996). Learning to teach. In D. C. Berliner & R. C. Calfee (Eds.), *Handbook of educational psychology* (pp. 673–708). London, England: Prentice Hall International.

Boyd, D. J., Grossman, P., Lankford, H., Loeb, S., Michelli, N. M., & Wyckoff, J. (2006). Complex by design: Investigating pathways into teaching in New York City schools. *Journal of Teacher Education, 57*(2), 155–166. doi:10.1177/0022487105285943

Boyd, D. J., Grossman, P. L., Lankford, H., Loeb, S., & Wyckoff, J. (2009). Teacher preparation and student achievement. *Educational Evaluation and Policy Analysis, 31*(4), 416–440. doi:10.3102/0162373709353129

British Educational Research Association [BERA]. (2014). *The role of research in teacher education: Reviewing the evidence. Interim report of the BERA-RSA-Inquiry*. Retrieved from http://www.bera.ac.uk/wp-content/uploads/2014/02/BERA-RSA-Interim-Report.pdf.

Britzman, D. (2003). *Practice makes practice: A critical study of learning to teach*. Albany, NY: State University of New York Press.

Bronäs, A., & Selander, S. (2006). *Verklighet verklighet: Teori och praktik i lärarutbildning* [Reality reality:Theory and practice in teacher education]. Stockholm, Sweden: Norstedt.

Brophy, J. (Ed.) (2004). *Using video in teacher education*. Boston, MA: Elsevier.

Brouwer, N., & Korthagen, F. (2005). Can teacher education make a difference? *American Educational Research Journal, 42*(1), 153–224. doi:10.3102/00028312042001153

Burn, K., & Mutton, T. (2015). A review of "research-informed clinical practice" in initial teacher education. *Oxford Review of Education, 41*(2), 217–233. doi:10.1080/03054985.2015.1020104

Burnaford, G. (2011). Experienced educators and practitioner research: The challenge for university graduate programs. In I. M. Saleh & M. S. Khine (Eds.), *Practitioner Research in Teacher Education: Theory and Best Practices* (pp. 303–319). Frankfurt, Germany: Peter Lang.

Calderhead, J. (1989). Reflective teaching and teacher education. *Teaching and Teacher Education, 5*(1), 43–51. doi:10.1016/0742-051X(89)90018-8

Canrinus, E. T., Bergem, O. K., Klette, K., & Hammerness, K. (2015). Coherent teacher education programmes: Taking a student perspective. *Journal of Curriculum Studies*, 1–21. doi:10.1080/00220272.2015.1124145

Canrinus, E. T., Bergem, O. K., Klette, K., & Hammerness, K. (2016). Opportunities to enact practice in campus courses: Taking a student perspective. Manuscript in preparation.

Carlgren, I., & Klette, K. (2008). Reconstructions of Nordic Teachers: Reform policies and teachers' work during the 1990s. *Scandinavian Journal of Educational Research, 52*(2), 117-133. doi:10.1080/00313830801915754

Carr, W., & Kemmis, S. (1986). *Becoming critical: Education, knowledge, and action research*. London, England: Falmer Press.

Carroll, J. (1963). A model for school learning. *Teachers College Record, 64*(8), 723–733. Retrieved from

Charalambous, C. Y., Hill, H. C., & Ball, D. L. (2011). Prospective teachers' learning to provide instructional explanations: How does it look and what might it take? *Journal of Mathematics Teacher Education, 14*(6), 441–463. doi:10.1007/s10857-011-9182-z

Church, T. A. (2010). Measurement issues in cross-cultural research. In G. Walford, E. Tucker, & M. Viswanathan (Eds.), The SAGE Handbook of Measurement (pp. 151–176). London, England: SAGE Publications Ltd. doi:10.4135/9781446268230

Cochran-Smith, M., Feiman-Nemser, S., McIntyre, D. J., & Demers, K. E. (2010). *Handbook of research on teacher education: Enduring questions in changing contexts* (3rd ed.). Hoboken, NJ: Taylor and Francis.

Cochran-Smith, M., & Lytle, S. L. (2009). *Inquiry as stance: Practitioner research for the next generation*. New York, NY: Teachers College Press.

Cochran-Smith, M., Villegas, A. M., Abrams, L. W., Chávez-Moreno, L. C., Mills, T., & Stern, R. (2016). Research on teacher preparation: Charting the landscape of a sprawling field. In D. H. Gitomer & C. A. Bell (Eds.), *Handbook of research on teaching* (5th ed., pp. 439–547). Washington, DC: American Educational Research Association.

Conway, P. F., & Munthe, E. (2015). The practice turn. Research-informed clinical teacher education in two countries. In J.-K. Smedby & M. Stutphen (Eds.), *From vocational to professional education. Educating for social welfare* (pp. 146–163). London, England: Routledge.

Creswell, J. W. (2013). *Qualitative inquiry & research design: Choosing among five approaches*. Los Angeles, CA: Sage.

Cronbach, L. J. (1975). Beyond the two disciplines of scientific psychology. *American Psychologist, 30*, 116–127. doi:10.1037/h0076829

Dahl, A. G. (2012). Seminar som bindeledd mellom teori og praksis i lærerutdanningen [Seminar as a way to connect theory and practice in teacher education]. *Uniped, 35*(2), 94–99. Retrieved from https://www.idunn.no/file/pdf/66753509/seminar_som_bindeledd_mellom_teori_og_praksis_i_laererutdann.pdf

Dall'Alba, G., & Sandberg, J. (2006). Unveiling professional development: A critical review of stage models. *Review of Educational Research, 76*(3), 383–412. doi:10.3102/00346543076003383

Dalland, C. (2011). Utfordringer ved gjenbruk av andres kvalitative data [Challenges with re-use of qualitative data]. *Norsk pedagogisk tidsskrift, 95*(6), 449–459. Retrieved from http://www.idunn.no/ts/npt/2011/06/art04

Darling-Hammond, L. (2006). *Powerful teacher education: Lessons from exemplary programs*. San Francisco, CA: Jossey-Bass.

Darling-Hammond, L. (2013). *Getting teacher evaluation right: What really matters for effectiveness and improvement*. New York, NY: Teachers College Press.

Darling-Hammond, L., Bransford, J., LePage, P., Hammerness, K., & Duffy, H. (Eds.). (2005). *Preparing teachers for a changing world. What teachers should learn and be able to do*. San Francisco, CA: Jossey-Bass

Darling-Hammond, L., Burns, D., Campbell, C., Goodwin, L., Hammerness, K., Low, E. L., . . . Zeichner, K. M. (2017). *Empowered Educators: How high performing systems shape teaching quality around the world.* . San Francisco, CA: Jossey-Bass.

Darling-Hammond, L., Chung, R., & Frelow, F. (2002). Variation in teacher preparation: How well do different pathways prepare teachers to teach? *Journal of Teacher Education, 53*(4), 286–302. doi:10.1177/0022487102053004002

Darling-Hammond, L., Dieckmann, J., Haertel, E., Lotan, R., Newton, X., Philipose, S., . . . Williamson, P. (2010). Studying teacher effectiveness: The challenges of developing valid measures. In G. Walford, E. Tucker, & M. Viswanathan (Eds.), *The SAGE Handbook of Measurement* (pp. 87–106). London, England: SAGE Publications Ltd.

Darling-Hammond, L., Hammerness, K., Grossman, P., Frances, R., & Shulman, L. S. (2005). The design of teacher education programs. In L. Darling-Hammond & J. Bransford (Eds.), *Preparing teachers for a changing world. What teachers should know and be able to do* (pp. 390–441). San Francisco, CA: Jossey-Bass.

Darling-Hammond, L., Holtzman, D., Gatlin, S. J., & Heilig, J. V. (2005). Does teacher preparation matter? Evidence about teacher certification, Teach for America, and teacher effectiveness. *Education Policy Analysis Archives, 13*(42), 1-51. doi:10.14507/epaa.v13n42.2005

Davin, K. J., & Troyan, F. J. (2015). The implementation of high‐leverage teaching practices: From the university classroom to the field site. *Foreign Language Annals, 48*(1), 124–142. doi:10.1111/flan.12124

Dong, Y., & Peng, C.-Y. J. (2013). Principled missing data methods for researchers. *SpringerPlus, 2*(222), 1–17. doi:10.1186/2193-1801-2-222

Dotger, B. H. (2015). Core pedagogy: Individual uncertainty, shared practice, formative ethos. *Journal of Teacher Education, 66*(3), 215–226. doi:10.1177/0022487115570093

Dreyfus, H. L., & Dreyfus, S. E. (1986). *Mind over machine: The power of human intuition and expertise in the era of the computer*. New York, NY: Free Press.

Edwards-Groves, C. J., & Hoare, R. L. (2012). "Talking to learn": Focussing teacher education on "dialogue" as a core practice for teaching and learning. *Australian Journal of Teacher Education, 37*(8), 82-100. Retrieved from http://ro.ecu.edu.au/cgi/viewcontent.cgi?article=1902&context=ajte

Eisenhardt, K. M., & Graebner, M. E. (2007). Theory building from cases: Opportunities and challenges. *Academy of Management Journal, 50*(1), 25–32. doi:10.5465/amj.2007.24160888

Elliott, J. (1991). *Action research for educational change*. Philadelphia, PA: Open University Press.

Engelien, K., Eriksen, T., & Jakhelln, R. (2015). Integrerte studiedesign for femårig lærerutdanning [Integrated study design for five-year teacher education]. In U. Rindal, A. Lund, & R. Jakhelln (Eds.), *Veier til fremragende lærerutdanning* [Roads towards excellent teacher education] (pp. 157–169). Oslo, Norway: Universitetsforlaget.

Expert committee on the role of the teacher. (2016). *On the role of the teacher*. Bergen, Norway: Fagbokforlaget.

Feiman-Nemser, S. (2008). Teacher learning: How do teachers learn to teach? In M. Cockran-Smith, S. Feiman-Nemser, J. McIntyre, & K. E. Demers (Eds.), *Handbook of research on teacher education: Enduring questions in changing contexts* (3rd ed., pp. 697–705). New York, NY: Routledge.

Feiman-Nemser, S., & Remillard, J. (1996). Perspectives on learning to teach. In F. B. Murray (Ed.), The teacher educator's handbook (pp. 1–35). San Francisco, CA: Jossey- Bass. Retrieved from file:///C:/Users/ingaj/AppData/Local/Temp/Perspectives_on_learning_to_teach.pdf.

Feiman-Nemser, S., Tamir, E., & Hammerness, K. (Eds.). (2014). *Inspiring teaching. Preparing teachers to succeed in mission-driven schools*. Cambridge: Harvard Ed Press.

Field, A. (2009). *Discovering statistics using SPSS* (3rd ed.). Los Angeles, CA: SAGE.

Field, K. (1979). *Teacher development: A study of the stages in the development of teachers*. Brookline, MA: Brookline Teacher Center.

Finne, H., Mordal, S., & Stene, T. M. (2014). *Oppfatninger av studiekvalitet i lærerutdanningene 2013* [Perceived study quality in teacher education 2013] Retrieved from http://ivu.sintef.no/dok/sintef_1127901.pdf

Fleiss, J. L., Levin, B., & Paik, M. C. (2003). *Statistical methods for rates and proportions*. Hoboken, NJ: Wiley.

Floden, R. E. (2002). The measurement of opportunity to learn. In A. C. Porter & A. Gamoran (Eds.), *Methodological advances in cross-national surveys of educational achievement* (pp. 231–266). Washington, D.C.: National Academy Press.

Flyvbjerg, B. (2006). Five misunderstandings about case-study research. *Qualitative Inquiry, 12*(2), 219–245. doi:10.1177/1077800405284363

Forzani, F. M. (2014). Understanding "core practices" and "practice-based" teacher education: Learning from the past. *Journal of Teacher Education, 65*(4), 357–368. doi:10.1177/0022487114533800

Fosse, B. O. (2011). *Lærerstudenters innramming og forståelse av tilpasset opplæring. En studie av kollektive læringsprosesser i ulike kontekster i en praktisk pedagogisk utdanning* [Teacher candidates' framing and understanding of adaptive teaching. A study of collective learning processes in different contexts of teacher education]. (Doctoral thesis, Faculty of Educational Sciences, University of Oslo, Oslo, Norway). Retrieved from https://www.duo.uio.no/bitstream/handle/10852/53231/PhD-Fosse.pdf?sequence=1&isAllowed=y

Fosse, B. O. (2016). Transformering av kunnskap mellom campus og skole i lærerutdanningen [Transformation of knowledge between campus and school in teacher education]. *Acta Didactica Norge, 10*(2), 235–251. Retrieved from https://www.journals.uio.no/index.php/adno/article/view/2498

Fosse, B. O., & Hovdenak, S. S. (2014). Lærerutdanning og lærerprofesjonalitet i spenningsfeltet mellom ulike kunnskapsformer [Teacher education and teacher professionalism in tension between different forms of knowledge]. *Norsk pedagogisk tidsskrift, 98*(02), 66–77. Retrieved from http://www.idunn.no/ts/npt/2014/02/laererutdanning_og_laererprofesjonalitet_i_spenni ngsfeltet_me

Fuller, F. F., & Bown, O. H. (1975). Becoming a teacher. In K. Ruyan (Ed.), *Teacher Education. 74th Yearbook of the National Society for the Study of Education* (pp. 25–52). Chicago, IL: University of Chicago Press.

Gall, M. D., Gall, J. P., & Borg, W. R. (2007). *Educational research: An introduction* (8th ed.). Boston, MA: Allyn and Bacon.

Ghousseini, H. (2015). Core practices and problems of practice in learning to lead classroom discussions. *The Elementary School Journal, 115*(3), 334–357. doi:10.1086/680053

Ghousseini, H., Beasley, H., & Lord, S. (2015). Investigating the potential of guided practice with an enactment tool for supporting adaptive performance. *Journal of the Learning Sciences, 24*(3), 461–497. doi:10.1080/10508406.2015.1057339

Ghousseini, H., & Sleep, L. (2011). Making practice studyable. *ZDM, 43*(1), 147-160. doi:10.1007/s11858-010-0280-7

Gilje, Ø. (2012). *Fem piler mot fremtidens lærerutdanning* [Five arrows towards the teacher education of the future].   Retrieved from http://docplayer.me/6264804-Fem-piler-mot-fremtidens-laererutdanning.html

Gloppen, B. H. (2013). Trepartssamtalen– en arena for å styrke samspillet mellom høgskolens undervisning og praksis? Eksempler fra lærerutdanningen [The trialogue-an arena to stengthen the cooperation between the teaching on the University Colleges and practice? Examples from teacher education]. *Uniped, 36*(01), 88–101. Retrieved from http://www.idunn.no/ts/uniped/2013/01/trepartssamtalen_en_arena_for_aa_styrke_sam spillet_mellom_h

Gough, D., Oliver, S., & Thomas, J. (2012). *An introduction to systematic reviews*. Los Angeles, CA: SAGE.

Groom, B., & Maunonen-Eskelinen, I. (2006). The use of portfolios to develop reflective practice in teacher training: A comparative and collaborative approach between two teacher training providers in the UK and Finland. *Teaching in Higher Education, 11*(3), 291–300. doi:10.1080/13562510600680632

Grossman, P. (2013). Foreword. In M. Ben-Peretz, S. Kleeman, R. Reichenberg, & S. Shimoni (Eds.), *Teacher educators as members of an evolving profession* (pp. v–vii). Lanham, MD: Rowman & Littlefield.

Grossman, P., Compton, C., Igra, D., Ronfeldt, M., Shahan, E., & Williamson, P. (2009). Teaching practice: A cross-professional perspective. *Teachers College Record, 111*(9), 2055–2100. Retrieved from https://cset.stanford.edu/sites/default/files/files/documents/publications/Grossman-TeachingPracticeACross-ProfessionalPerspective.pdf

Grossman, P., Hammerness, K., & McDonald, M. A. (2009). Redefining teaching, re-imagining teacher education. *Teachers and teaching: Theory and practice, 15*(2), 273–290. doi:10.1080/13540600902875340

Grossman, P., Hammerness, K., McDonald, M. A., & Ronfeldt, M. (2008). Constructing coherence: Structural predictors of perceptions of coherence in NYC teacher education programs. *Journal of Teacher Education, 59*(4), 273–287. doi:10.1177/0022487108322127

Grossman, P., & McDonald, M. A. (2008). Back to the future: Directions for research in teaching and teacher education. *American Educational Research Association, 45*(1), 184–205. doi:10.3102/000283120 7312906

Grundy, S. (1982). Three modes of action research. *Curriculum Perspectives, 2*(3), 23–34.

Habermas, J. (1972). *Knowledge and human interests*. London, England: Heinemann.

Habermas, J. (1974). *Theory and practice*. London, England: Heinemann.

Halvorsen, K. V. (2014). Utvikling av partnerskap i en femårig lektorutdanning - sett fra et økologisk perspektiv [Development of pratnerships within a five-year teacher education - from an ecological perspective]. *Norsk pedagogisk tidsskrift, 98*(01), 14–25. Retrieved from http://www.idunn.no/ts/npt/2014/01/utvikling_av_partnerskap_ienfemaarig_lektorutdanning_-set

Hammerness, K. (2006). From coherence in theory to coherence in practice. *Teachers College Record*, 1241–1265. Retrieved from https://ed.stanford.edu/sites/default/files/from_coherence_in_theory_to_coherence_in_practice.pdf

Hammerness, K. (2013). Examining features of teacher education in Norway. *Scandinavian Journal of Educational Research, 57*(4), 400–419. doi:10.1080/00313831.2012.656285

Hammerness, K., Darling-Hammond, L., Bransford, J., Berliner, D., Cochran-Smith, M., McDonald, M. A., & Zeichner, K. M. (2005). How teachers learn and develop. In L. Darling-Hammond & J. Brandford (Eds.), *Preparing teachers for a changing world: What teachers should learn and be able to do* (pp. 358–389). San Francisco, CA: Jossey-Bass.

Hammerness, K., & Klette, K. (2015). Indicators of quality in teacher education: Looking at features of teacher education from an international perspective. In A. W. Wiseman & G. K. LeTendre (Eds.), *Promoting and sustaining a quality teaching workforce* (Vol. 27, pp. 239–277). Bingley, UK: Emerald Group Publishing.

Hammersley, M. (2008). *Questioning qualitative inquiry: Critical essays*. Los Angeles, CA: SAGE.

Hammersley, M. (2010). Is social measurement possible, and is it necessary? In G. Walford, E. Tucker, & M. Viswanathan (Eds.), *The SAGE handbook of measurement* (pp. 409–426). London, England: SAGE Publications Ltd.

Hansén, S.-E., Eklund, G., & Sjöberg, J. (2015). General didactics in Finnish teacher education - The case of class teacher education at Åbo Akademi University. *Nordisk Tidskrift för Allmän Didaktik, 1*(1), 7–20. Retrieved from http://noad.ub.gu.se/index.php/noad/article/view/11/3

Hansén, S.-E., Forsman, L., Aspfors, J., & Bendtsen, M. (2012). Visions for teacher education – experiences from Finland [VISIONS 2011: Teacher Education]. *Acta Didactica Norge, 6*(1). Retrieved from http://adno.no/index.php/adno/article/view/207

Hansén, S.-E., & Wikman, T. (2016). *Kärnkurser i lärarprogram (UVK). Analys av dokument, intervjuer, enkätsvar och observationer* [Core courses in teacher education. Analysis of documents, interviews, surveys and observations]. Institut för pedagogik, didaktik och utbildningsstudier, Uppsala Universitet, Uppsala, Sweden.

Hanson, N. R. (1958). *Patterns of discovery*. Cambridge, England: Cambridge University Press.

Hatch, T., & Grossman, P. (2009). Learning to look beyond the boundaries of representation: Using technology to examine teaching (Overview for a digital exhibition: Learning from the practice of teaching). *Journal of Teacher Education, 60*(1), 70–85. doi:10.1177/0022487108328533

Hatlevik, I. K. R. (2014). *Meningsfulle sammenhenger: En studie av sammenhenger mellom læring på ulike arenaer og utvikling av ulike aspekter ved profesjonell kompetanse hos studenter i sykepleier-, lærer- og sosialarbeiderutdanningene* [Sense of coherence: A

study of relationships between learning in different arenas and development of various aspects of professional competence among students in initial nursing, teaching and social work programmes]. (Doctoral thesis, Centre for the Study of Professions, Oslo and Akershus University College of Applied Sciences, Oslo, Norway). Retrieved from https://oda.hio.no/jspui/bitstream/10642/2397/1/1205775.pdf

Hatton, N., & Smith, D. (1995). Reflection in teacher education: Towards definition and implementation. *Teaching and Teacher Education, 11*(1), 33–49. doi:10.1016/0742-051X(94)00012-U

Haugaløkken, O. K., & Ramberg, P. (2007). Autonomy or control: Discussion of a central dilemma in developing a realistic teacher education in Norway. *Journal of Education for Teaching, 33*(1), 55–69. doi:10.1080/02607470601098310

Haugan, J. A. (2011). A systematic review of research regarding Norwegian general teacher education 2000–2010. *Nordic Studies in Education, 31*(04). Retrieved from http://www.idunn.no/ts/np/2011/04/art03

Hauge, T. E. (2002). Casearbeid og mappevurdering som integreringsverktøy i lærerutdanningen [Case studies and portfolio as tools for integration in teacher education]. In S. Ludvigsen & T. L. Hoel (Eds.), *Et utdanningssystem i endring. IKT og læring* [A changing educational system. ICT and learning] (pp. 149–172). Oslo, Norway: Gyldendal Akademisk.

Hauge, T. E. (2004). *Praktisk-pedagogisk utdanning i digitale læringsomgivelser. Sluttrapport fra PLUTO-prosjektet 2000-2003* [Teacher education in digital learning environments. Final report of the PLUTO-project 2000-2003]. Retrieved from http://www.uv.uio.no/ils/english/research/projects/PLUTO-ILS/publications/Sluttrapport2003_utg3.pdf

Hauge, T. E. (2006). Portfolios and ICT as Means of Professional Learning in Teacher Education. *Studies in Educational Evaluation, 32*(1), 23–36. doi:10.1016/j.stueduc.2006.01.002

Helgevold, N., Næsheim-Bjørkvik, G., & Østrem, S. (2015). Key focus areas and use of tools in mentoring conversations during internship in initial teacher education. *Teaching and Teacher Education, 49*, 128–137. doi:10.1016/j.tate.2015.03.005

Herr, K., & Anderson, G. L. (2005). *Action research dissertation: A guide for students and faculty* Retrieved from http://methods.sagepub.com/book/the-action-research-dissertation

Hiebert, J., Morris, A. K., Berk, D., & Jansen, A. (2007). Preparing teachers to learn from teaching. *Journal of Teacher Education, 58*(1), 47–61. doi:10.1177/0022487106295726

Hine, G. S. (2013). The importance of action research in teacher education programs. *Issues in Educational Research, 23*(2), 151-163. Retrieved from http://www.iier.org.au/iier23/hine.pdf

Hobson, A. J., Ashby, P., Malderez, A., & Tomlinson, P. D. (2009). Mentoring beginning teachers: What we know and what we don't. *Teaching and Teacher Education, 25*(1), 207–216. doi:10.1016/j.tate.2008.09.001

Hodge, S. (2007). The origins of competency-based training. *Australian journal of adult learning, 47*(2), 179–209. Retrieved from http://files.eric.ed.gov/fulltext/EJ797578.pdf

Husebo, D. (2012). Bridging theory and practice in Norwegian teacher education through action research. *Educational Action Research, 20*(3), 455–471. doi:10.1080/09650792.2012.697665

Interstate New Teacher Assessment and Support Consortium. (1992). *Model Standards for BeginningTeacher Licensing and Development: A Resource for State Dialogue*. Washington, DC: Council of Chief State School Officers.

Jahreie, C. F. (2010). *Learning to teach: An activity-theoretical study of student teachers' participation trajectories across boundaries.* (Doctoral Thesis, Faculty of Education, University of Oslo, Oslo, Norway). Retrieved from http://www.uv.uio.no/iped/forskning/aktuelt/aktuelle-saker/dokumenter/Learning%20to%20teach_Jahreie_PhDThesis.pdf

Jakku-Sihvonen, R., & Niemi, H. (Eds.). (2006). *Research-based teacher education in Finland: Reflections by Finnish teacher educators* (Vol. 25). Turku, Finland: Suomen Kasvatustieteellinen Seura.

Janssen, F., Westbroek, H., & Doyle, W. (2014). The practical turn in teacher education: Designing a preparation sequence for core practice frames. *Journal of Teacher Education, 65*(3), 195–206. doi:10.1177/0022487113518584

Jay, J. K., & Johnson, K. L. (2002). Capturing complexity: A typology of reflective practice for teacher education. *Teaching and Teacher Education, 18*(1), 73–85. doi:10.1016/S0742-051X(01)00051-8

Jenset, I. S., Klette, K., & Hammerness, K. (2014). Coding Book: Teacher education observation protocol. Retrieved from Department of Teacher Education and School

Research, University of Oslo, Oslo, Norway:

http://www.uv.uio.no/ils/english/research/projects/cate/Instruments/

Jyrhämä, R., Kynäslahti, H., Krokfors, L., Byman, R., Maaranen, K., Toom, A., & Kansanen, P. (2008). The appreciation and realisation of research‐based teacher education: Finnish students' experiences of teacher education. *European Journal of Teacher Education, 31*(1), 1–16. doi:10.1080/02619760701844993

Kaasila, R., & Lauriala, A. (2012). How do pre-service teachers' reflective processes differ in relation to different contexts? *European Journal of Teacher Education, 35*(1), 77–89. doi:10.1080/02619768.2011.633992

Kagan, D. M. (1992). Professional growth among preservice and beginning teachers. *Review of Educational Research, 62*(2), 129–169. doi:10.2307/1170578

Kansanen, P. (1991). Pedagogical thinking: The basic problem of teacher education. *European Journal of Education, 26*(3), 251–260. doi:10.2307/1503027

Kansanen, P. (2004). The role of general education in teacher education. *Zeitschrift für Erziehungswissenschaft, 7*(2), 207–218. doi:10.1007/s11618-004-0022-0

Kazemi, E., & Franke, M. L. (2004). Teacher learning in mathematics: Using student work to promote collective inquiry. *Journal of Mathematics Teacher Education, 7*(3), 203–235. doi:10.1023/B:JMTE.0000033084.26326.19

Kazemi, E., Ghousseini, H., Cunard, A., & Turrou, A. C. (2016). Getting inside rehearsals: Insights from teacher educators to support work on complex practice. *Journal of Teacher Education, 67*(1), 18–31. doi:10.1177/0022487115615191

Kemmis, S., McTaggart, R., & Nixon, R. (2014). *The action research planner: Doing critical participatory action research*. Singapore: Springer.

Kennedy, M. (1999). The role of pre-service teacher education. In L. Darling-Hammond & G. Sykes (Eds.), *Teaching as the learning profession: Handbook of teaching and policy* (pp. 54–86). San Francisco, CA: Jossey Bass.

Kennedy, M. (2008). The place of teacher education in teachers' education. In M. Cockran-Smith, S. Feiman-Nemser, J. McIntyre, & K. E. Demers (Eds.), *Handbook of research on teacher education. Enduring Questions in Changing Contexts* (3rd ed., pp. 1199–1203). New York; NY: Routledge.

Kennedy, M. (2015). Parsing the practice of teaching. *Journal of Teacher Education, 67*(1), 6-17. doi:10.1177/0022487115614617

Kitchen, J., & Stevens, D. (2008). Action research in teacher education. Two teacher-educators practice action research as they introduce action research to preservice teachers. *Action Research, 6*(1), 7–28. doi:10.1177/1476750307083716

Klette, K. (2009). Challenges in strategies for complexity reduction in video studies. Experiences from the PISA+ study: A video study of teaching and learning in Norway. In T. Janìk & T. Seidel (Eds.), *The power of video studies in investigating teaching and learning in the classroom* (pp. 61–82). Münster, Germany: Waxmann.

Klette, K., & Blikstad-Balas, M. (2016). *Coding manuals as lenses to classroom teaching: Measuring teaching qualities. Manuscript submitted for publication*.

Klette, K., Jenset, I. S., & Hammerness, K. (2016). *Divergence and convergence in teacher education*. Manuscript in preparation.

Klette, K., Lund, A., Knudsen, G., Mathiassen, K., Jenset, I. S., Vinjar, M. B., . . . Carlsten, T. C. (2011). *Fagvisjoner i pedagogisk praksis: Program for Utdanning av Pedagogiske faglærere ved ILS (PUPILS). Sluttrapport fra utredningskomitéen for en modell for fornying av lærerutdanningen ved Institutt for lærerutdanning og skoleforskning ved UiO* [Visions for pedagogical practice: Program for the Education of Teachers at ILS (PUPILS). Final report from the committee for the development of teacher education at ILS]. Retrieved from Department of Teacher Education and School Research, University of Oslo, Oslo, Norway: http://www.uv.uio.no/ils/studier/kvalitet/pupils/pupils-rapport.pdf

Kleven, T. A. (2008). Validity and validation in qualitative and quantitative research. *Nordic Studies in Education, 28*, 219–233. Retrieved from https://www.idunn.no/file/pdf/33192817/validity_and_validation_in_qualitative_and_quantitative_research.pdf

Korthagen, F. A. J. (2001). *Linking practice and theory: The pedagogy of realistic teacher education*. Mahwah, NJ: L. Erlbaum Associates.

Korthagen, F. A. J., & Kessels, J. P. A. M. (1999). Linking theory and practice: Changing the pedagogy of teacher education. *Educational Researcher, 28*(4), 4–17. doi:10.3102/0013189x028004004

Krokfors, L., Jyrhämä, R., Kynäslahti, H., Toom, A., Maaranen, K., & Kansanen, P. (2006). Working while teaching, learning while working: Students teaching in their own class. *Journal of Education for Teaching, 32*(1), 21–36. doi:10.1080/02607470500510928

Krokfors, L., Kynäslahti, H., Stenberg, K., Toom, A., Maaranen, K., Jyrhämä, R., . . .

 Kansanen, P. (2011). Investigating Finnish teacher educators' views on research‐

 based teacher education. *Teaching Education, 22*(1), 1-13.

 doi:10.1080/10476210.2010.542559

Krumsvik, R., & Smith, K. (2009). Videopapers-An attempt to narrow the notorious gap

 between theory and practice in teacher education. *Technology, Pedagogy and*

 Education, 18(3), 269–278. Retrieved from

 http://www.informaworld.com/openurl?genre=article&id=doi:10.1080/147593909032

 55544

Kunzman, R. (2002). Preservice education for experienced teachers: What STEP teaches those

 who have already taught. *Issues in Teacher Education, 11*(1), 99-112.

Kvalbein, I. A. (2003). Norsk allmennlærerutdanning i et historisk perspektiv [Norwegian

 teacher education in a historical perspective]. In G. E. Karlsen & I. A. Kvalbein (Eds.),

 Norsk lærerutdanning: Søkelys på allmennlærerutdanningen i et reformperspektiv

 [Norwegian teacher education. Focus on teacher education in a reform perspective] (pp.

 24–41). Oslo, Norway: Universitetsforlaget.

Kvale, S., & Brinkmann, S. (2009). *Interviews: learning the craft of qualitative research*

 interviewing. Los Angeles, CA: Sage.

Kvernbekk, T. (2005). *Pedagogisk teoridannelse. Insidere, teoriformer og praksis*

 [Educational theorizing. Insiders, types of theory, and practice]. Bergen, Norway:

 Fagbokforlaget.

Kynäslahti, H., Kansanen, P., Jyrhämä, R., Krokfors, L., Maaranen, K., & Toom, A. (2006).

 The multimode programme as a variation of research-based teacher education.

 Teaching and Teacher Education, 22(2), 246–256. doi:10.1016/j.tate.2005.09.007

Lai, M. Y., Auhl, G., & Hastings, W. (2015). Improving pre-service teachers' understanding of

 complexity of mathematics instructional practice through deliberate practice: A case

 study on "study of teaching". *International Journal for Mathematics Teaching and*

 Learning, 1–25. Retrieved from http://www.cimt.org.uk/journal/munyee.pdf

Lampert, M. (2010). Learning teaching in, from, and for practice: What do we mean? *Journal*

 of Teacher Education, 61(1–2), 21–34. doi:10.1177/0022487109347321

Lampert, M., Franke, M. L., Kazemi, E., Ghousseini, H., Turrou, A. C., Beasley, H., . . .

 Crowe, K. (2013). Keeping it complex: Using rehearsals to support novice teacher

learning of ambitious teaching. *Journal of Teacher Education, 64*(3), 226–243. doi:10.1177/0022487112473837

Lampert, M., Ghousseini, H., & Beasley, H. (2015). Positioning novice teachers as agents in learning teaching. In L. Resnick, C. Asterhan, & S. Clarke (Eds.), *Socializing intelligence through academic talk and dialogue* (pp. 363–374). Washington, DC: American Educational Research Association.

Lampert, M., & Graziani, F. (2009). Instructional activities as a tool for teachers' and teacher educators' learning. *The Elementary School Journal, 109*(5), 491–509. doi:10.1086/596998

Leitch, R., & Day, C. (2000). Action research and reflective practice: Towards a holistic view. *Educational Action Research, 8*(1), 179–193. doi:10.1080/09650790000200108

Levine, A. (2006). *Educating school teachers*. Retrieved from The Education Schools Project website: http://www.edschools.org/pdf/Educating_Teachers_Report.pdf

Lewin, K. (1946). Action research and minority problems. *Journal of Social Issues, 2*(4), 34–46. doi:10.1111/j.1540-4560.1946.tb02295.x

Lid, S. E. (2013). *PPUs relevans for undervisning i skolen. En kartlegging av studenters og nyutdannede læreres oppfatninger* [The relevance of PPU (University based teacher education) for teaching in schools. A review of the perceptions of teacher candidates and newly educated teachers] *(Report 3-2013)*. Retrieved from NOKUT website: http://www.nokut.no/Documents/NOKUT/Artikkelbibliotek/Kunnskapsbasen/Rapport er/UA/2013/Lid_Stein_Erik_PPUs_relevans_for_undervisning_i_skolen_2013_3.pdf

Little, J. W. (2004). "Looking at student work" in the United States: Countervailing impulses in professional development. In C. Day & J. Sachs (Eds.), *International handbook on the continuing professional development of teachers* (pp. 94–118). Maidenhead, UK: Open University Press.

Little, J. W., Gearhart, M., Curry, M., & Kafka, J. (2003). Looking at student work for teacher learning, teacher community, and school reform. *Phi Delta Kappan, 85*(3), 184–192. doi:10.1177/003172170308500305

Little, J. W., & Horn, I. S. (2007). "Normalizing" problems of practice: Converting routine conversation into a resource for learning in professional communities. In L. Stoll & K. S. Louis (Eds.), *Professional learning communities: Divergence, depth, and dilemmas* (pp. 79–92). Maidenhead, England: Open University Press.

Livingston, C., & Borko, H. (1989). Expert-novice differences in teaching: A cognitive analysis and implications for teacher education. *Journal of Teacher Education, 40*(4), 36–42. doi:10.1177/002248718904000407

Lortie, D. (1975). *Schoolteacher: A sociological study*. Chicago, IL: The University of Chicago Press.

Loughran, J. (2014). Professionally developing as a teacher educator. *Journal of Teacher Education, 65*(4), 271-283. doi:10.1177/0022487114533386

Ludvigsen, S., & Flo, C. F. (2002). Innovasjon i lærerutdanningen: Hvordan skapes endring [Innovation in teacher education: How is change created]. In S. Ludvigsen & T. L. Hoel (Eds.), *Et utdanningssystem i endring. IKT og læring* [A changing educational system. ICT and learning] (pp. 83–104). Oslo, Norway: Gyldendal Akademisk.

Lund, A., & Eriksen, T. (2016). Teacher education as transformation: Some lessons learned from a center for excellence in education. *Acta Didactica Norge, 10*(2), 53–72. Retrieved from https://www.journals.uio.no/index.php/adno/article/view/2483/2458

Lund, A., Jakhelln, R., & Rindal, U. (2015). Fremragende lærerutdanning - Hva er det, og hvordan kan vi få det? [Excellent teacher education - What is it, and how can we get it?]. In U. Rindal, A. Lund, & R. Jakhelln (Eds.), *Veier til fremragende lærerutdanning* [Roads towards excellent teacher education] (pp. 13–35). Oslo: Universitetsforlaget.

Lund, T. (2005). A metamodel of central inferences in empirical research. *Scandinavian Journal of Educational Research, 49*(4), 385–398. doi:10.1080/00313830500202918

Maaranen, K. (2009a). Practitioner research as part of professional development in initial teacher education. *Teacher Development, 13*(3), 219–237. doi:10.1080/13664530903335574

Maaranen, K. (2009b). *Widening perspectives of teacher education. Studies on theory-practice relationship, reflection, research and professional development.* (Doctoral thesis, Faculty of Behavioural Sciences, University of Helsinki, Helsinki, Finland). Retrieved from https://helda.helsinki.fi/bitstream/handle/10138/19981/widening.pdf?sequence=2

Maaranen, K. (2010). Teacher students' MA theses—A gateway to analytic thinking about teaching? A case study of Finnish primary school teachers. *Scandinavian Journal of Educational Research, 54*(5), 487–500. doi:10.1080/00313831.2010.508923

Maaranen, K., & Krokfors, L. (2008). Researching pupils, schools and oneself. Teachers as integrators of theory and practice in initial teacher education. *Journal of Education for Teaching, 34*(3), 207–222. doi:10.1080/02607470802213825

Mathisen, K. (2009). Hadde jeg ikke lest så mye som jeg gjorde, hadde jeg helt sikkert ikke tenkt over like mye [If I hadn't read as much, I would not have thought about less]. *Uniped, 32*(3), 19–29.

Mattsson, M., Eilertsen, T. V., & Rorrison, D. (2011). *A Practicum Turn in Teacher Education*. Rotterdam, The Netherlands: Sense Publishers.

McAteer, M. (2013). *Action research in education*. Los Angeles, CA: Sage.

McDonald, M. A., Kazemi, E., & Kavanagh, S. S. (2013). Core practices and pedagogies of teacher education: A call for a common language and collective activity. *Journal of Teacher Education, 64*(5), 378–386. doi:10.1177/0022487113493807

McDonald, M. A., Kazemi, E., Kelley-Petersen, M., Mikolasy, K., Thompson, J., Valencia, S. W., & Windschitl, M. (2014). Practice makes practice: Learning to teach in teacher education. *Peabody Journal of Education, 89*(4), 500–515. doi:10.1080/0161956X.2014.938997

McKernan, J. (1996). *Curriculum action research: A handbook of methods and resources for the reflective practitioner* (2nd ed.). London, England: Kogan Page.

McNamee, M. J., & Bridges, D. (2002). *The ethics of educational research*. Oxford, UK: Blackwell.

McTaggart, R., & Kemmis, S. (1988). *The action research planner*. Geelong, Australia: Deakin University Press.

Mikkola, A., & Lähde, K. (2006). *Opettajankoulutus – tietoa, taitoa, tulevaisuutta. Opettajankoulutuksen kehittämisohjelman 2001–2005 loppuraportti* [Final report of the teacher training development programme] (32). Retrieved from http://www.minedu.fi/export/sites/default/OPM/Julkaisut/2006/liitteet/tr32.pdf?lang=fi.

Ministry of Education and Research. (2008–2009). *Læreren. Rollen og utdanningen [The teacher. The role and the education](White paper no. 11)*. Retrieved from https://www.regjeringen.no/contentassets/dce0159e067d445aacc82c55e364ce83/no/pdfs/stm200820090011000dddpdfs.pdf

Moon, B. (Ed.) (2016). *Do universities have a role in the education and training of teachers? An international analysis of policy and practice*. Cambridge, England: Cambridge University Press.

Moran, A., & Clarke, L. (2012). Back to the future: Do lessons from Finland point the way to a return to model schools for Northern Ireland? *European Journal of Teacher Education, 35*(3), 275–288. doi:10.1080/02619768.2012.660142

Mullen, C. (2012). Mentoring: An overview. In S. J. Fletcher & C. A. Mullen (Eds.), *The SAGE handbook of mentoring and coaching in education* (pp. 7–23). London, England: SAGE.

Munthe, E., & Haug, P. (2009). *Research on teacher education in Norway 2000-2009: Trends and gaps*. Paper presented at the EARLI conference, Amsterdam, The Netherlands.

Munthe, E., Malmo, K.-A. S., & Rogne, M. (2011). Teacher education reform and challenges in Norway. *Journal of Education for Teaching, 37*(4), 441–450. doi:10.1080/02607476.2011.611012

Munthe, E., & Rogne, M. (2015). Research based teacher education. *Teaching and Teacher Education, 46*, 17–24. doi:10.1016/j.tate.2014.10.006

Munthe, E., & Rogne, M. (2016). Norwegian teacher education: Development, steering and current trends. In B. Moon (Ed.), *Do universities have a role in the education and training of teachers? An international analysis of policy and practice* (pp. 35–55). Cambridge, England: Cambridge University Press.

Müller, M., Álamos, P., Meckes, L., & Sanyal, A. (2015). *Student teachers' perceptions of opportunities to develop core practices in a Chilean teacher education program*. Paper presented at the European Conference on Educational Research (ECER), Budapest, Hungary.

National Committees for Research Ethics in Norway [NESH]. (2010). *Guidelines for research ethics in the social sciences, law and the humanities*. Retrieved from https://www.etikkom.no/globalassets/documents/english-publications/guidelines-for-research-ethics-in-the-social-sciences-law-and-the-humanities-2006.pdf

National Council for Accreditation of Teacher Education [NCATE]. (2010). *Transforming teacher education through clinical practice: A national strategy to prepare effective teachers. Report of the Blue Ribbon Panel on Clinical Preparation and Partnerships for improved student learning*. Retrieved from http://www.ncate.org/LinkClick.aspx?fileticket=zzeiB1OoqPk%3D&tabid=7

National Research Council [NRC]. (2010). *Preparing teachers: Building evidence for sound policy*. Retrieved from The National Academies Press: http://www.nap.edu/read/12882/chapter/1

Nespor, J. (2006). Finding patterns with field notes. In J. L. Green, G. Camilli, P. B. Elmore, A. Skukauskait, & E. Grace (Eds.), *Handbook of complementary methods in education research* (pp. 297–308). Mahwah, N.J.: Lawrence Erlbaum.

Niemi, H. (2002). Active learning—A cultural change needed in teacher education and schools. *Teaching and Teacher Education, 18*(7), 763–780. doi:10.1016/S0742-051X(02)00042-2

Niemi, H. (2016). Academic and practical: Research-based teacher education in Finland. In B. Moon (Ed.), *Do universities have a role in the education and training of teachers? An international analysis of policy and practice* (pp. 19–33). Cambridge, England: Cambridge University Press.

Niemi, H., & Jakku-Sihvonen, R. (2006). Research-based teacher education. In R. Jakku-Sihvonen & H. Niemi (Eds.), *Research based teacher education in Finland: Reflections by Finnish teacher educators* (pp. 31–47). Turku, Finland: Finnish Educational Research Association.

Niemi, H., & Kohonen, V. (1995). Evaluation of quality in Finnish teacher education. *European Journal of Teacher Education, 18*(1), 83–95. doi:10.1080/0261976950180107

Niemi, H., & Nevgi, A. (2014). Research studies and active learning promoting professional competences in Finnish teacher education. *Teaching and Teacher Education, 43*, 131–142. doi:10.1016/j.tate.2014.07.006

Niemi, H., Nevgi, A., & Aksit, F. (2016). Active learning promoting student teachers' professional competences in Finland and Turkey. *European Journal of Teacher Education, 39*(4), 471–490. doi:10.1080/02619768.2016.1212835

Norwegian Agency for Quality Assurance in Education [NOKUT]. (2006). Evaluering av allmennlærerutdanningen i Norge 2006. Del 1: Hovedrapport [Evaluation of general teacher education in Norway 2006. Part 1: Main report]. Retrieved from http://www.nokut.no/Documents/NOKUT/Artikkelbibliotek/Norsk_utdanning/Evaluering/alueva/ALUEVA_Hovedrapport.pdf

Norwegian Government. (2014). Innfører femårig lærerutdanning på masternivå [Introduces five-year teacher education on master level] [Press release]. Retrieved from https://www.regjeringen.no/no/aktuelt/utsetter-krav-om-mastergrad-for-ppu/id2482527/

Organization for Economic Co-operation and Development [OECD]. (2005). Teachers matter: Attracting, developing and retaining effective teachers. Retrieved from http://www.oecd.org/education/school/34990905.pdf

Organization for Economic Co-operation and Development [OECD]. (2013). *Education at a Glance 2013: OECD Indicators* Retrieved from https://www.oecd.org/edu/eag2013%20(eng)--FINAL%2020%20June%202013.pdf

Organization for Economic Co-operation and Development [OECD]. (2014). PISA 2012 results.   Retrieved from https://www.oecd.org/pisa/keyfindings/pisa-2012-results-volume-I.pdf

Peck, C. A., Gallucci, C., & Sloan, T. F. (2010). Negotiating implementation of high-stakes performance assessment policies in teacher education: From compliance to inquiry. *Journal of Teacher Education, 61*(5), 451–463. doi:10.1177/0022487109354520

Peercy, M. M. (2014). Challenges in enacting core practices in language teacher education: A self-study. *Studying Teacher Education, 10*(2), 146–162. doi:10.1080/17425964.2014.884970

Personal Data Act. (2000). Act of 14 April 2000 No. 31 relating to the processing of personal data.

Phillips, D. K., & Carr, K. (2009). Dilemmas of trustworthiness in preservice teacher action research. *Action Research, 7*(2), 207–226. doi:10.1177/1476750308097027

Pianta, R. C., & Hamre, B. K. (2009). Conceptualization, measurement, and improvement of classroom processes: Standardized observation can leverage capacity. *Educational Researcher, 38*(2), 109–119. doi:10.3102/0013189x09332374

Protocol for Language Arts Teaching Observations [PLATO] 5.0. (June 2015). *Training and Observation Protocol.* Center to Support Excellence in Teaching (CSET), Stanford University, Stanford.

Raivola, R. (1985). What is comparison? Methodological and philosophical considerations. *Comparative Education Review, 29*(3), 362–374. Retrieved from http://www.jstor.org/stable/1188494

Rasmussen, J. (2008). Nordic teacher education programmes in a period of transition: The end of a well-established and long tradition of 'seminarium'-based education. In B. Hudson & P. Zgaga (Eds.), *Teacher education policy in Europe: A Voice of higher education institutions* (pp. 325–344). Umeå, Sweden: University of Umeå, Faculty of Teacher Education.

Rasmussen, J., & Bayer, M. (2014). Comparative study of teaching content in teacher education programmes in Canada, Denmark, Finland and Singapore. *Journal of Curriculum Studies, 46*(6), 798–818. doi:10.1080/00220272.2014.927530

Reid, J.-A. (2011). A practice turn for teacher education? *Asia-Pacific Journal of Teacher Education, 39*(4), 293–310. doi:10.1080/1359866X.2011.614688

Ronfeldt, M. (2012). Where should student teachers learn to teach? Effects of field placement school characteristics on teacher retention and effectiveness. *Educational Evaluation and Policy Analysis, 34*(1), 3–26. doi:10.3102/0162373711420865

Ronfeldt, M. (2015). Field placement schools and instructional effectiveness. *Journal of Teacher Education, 66*(4), 304–320. doi:10.1177/0022487115592463

Routarinne, S., & Ylirisku, S. (2012). Video card game as a learning design for teacher education. *Procedia - Social and Behavioral Sciences, 45*, 370–380. doi:10.1016/j.sbspro.2012.06.573

Rørnes, K. (2015). Universitetsskoler i lærerutdanningen: Å koble praksis og teori i lærerutdanningen [University schools in teacher education: Connecting practice and theory in teacher education] In U. Rindal, A. Lund, & R. Jakhelln (Eds.), *Veier til fremragende lærerutdanning* [Roads towards excellent teacher education] (pp. 75–86). Oslo, Norway: Universitetsforlaget.

Sahlberg, P. (2011). *Finnish lessons: What can the world learn from educational change in Finland?* New York, NY: Teachers College Press.

Sauermann, H., & Roach, M. (2013). Increasing web survey response rates in innovation research: An experimental study of static and dynamic contact design features. *Research Policy, 42*(1), 273–286. doi:10.1016/j.respol.2012.05.003

Schön, D. (1983). *The reflective practitioner: How professionals think in action*. New York, NY: Basic Books.

Schön, D. (1987). *Educating the reflective practitioner: toward a new design for teaching and learning in the professions*. San Francisco, CA: Jossey-Bass.

Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and Quasi-experimental Designs for Generalized Causal Inference*. Boston, MA: Houghton Mifflin Company.

Shulman, L. S. (2005). Signature pedagogies in the professions. *Daedalus, 134*(3), 52–59. Retrieved from http://www.jstor.org/stable/20027998

Shulman, L. S. (2015). PCK: Its genesis and exodus. In A. Berry, P. Friedrichsen, & J. Loughran (Eds.), *Re-examining pedagogical content knowledge in science education* (pp. 3–13). New York, NY: Routledge.

Sieber, J. E. (1992). *Planning ethically responsible research : A guide for students and internal review boards*. Newbury Park, CA: SAGE.

Silva, T., McKie, A., Knechtel, V., Gleason, P., & Makowsky, L. (2014). *Teaching residency programs: A multisite look at a new model to prepare teachers for high-need schools.* Retrieved from National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education: https://ies.ed.gov/ncee/pubs/20154002/pdf/20154002.pdf.

Silverman, D. (2006). *Interpreting qualitative data. Methods for analysing talk, text and interaction*. Los Angeles, CA: Sage.

Sitomaniemi-San, J. (2015). *Fabricating the teacher as researcher. A genealogy of academic teacher education in Finland.* (Doctoral thesis, Faculty of Education, University of Oulu, Oulu, Finland). Retrieved from http://jultika.oulu.fi/files/isbn9789526209937.pdf

Sjöberg, J., & Hansén, S.-E. (2006). Om att utveckla lärarkompetens - Relationen teori och praktik i lärarutbildningar [About developing teaching competence - The relationship between theory and practice in teacher education]. In A. Bronäs & S. Selander (Eds.), *Verklighet Verklighet. Teori och praktik i lärarutbildning.* [Reality Reality. Theory and Practice in teacher education]. Stockholm, Sweden: Norstedts Akademiska Förlag.

Sloan, T. F. (2015). Data and learning that affords program improvement: A response to the U.S. accountability movement in teacher education. *Educational Research for Policy and Practice, 14*(3), 259–271. doi:10.1007/s10671-015-9179-y

Smith, B. O., Cohen, S., & Pearl, A. (1969). *Teachers for the real world*. Washington, DC: American Association of Colleges for Teacher Education.

Smith, K. (2015). The role of research in teacher education. *Research in Teacher Education, 5*(2), 43–46. doi:10.15123/PUB.4767

Snell, J. (2011). Interrogating video data: Systematic quantitative analysis versus micro‐ethnographic analysis. *International Journal of Social Research Methodology, 14*(3), 253–258. doi:10.1080/13645579.2011.563624

Stake, R. E. (2006). *Multiple case study analysis*. New York, NY: Guilford Press.

Star, J. R., & Strickland, S. K. (2008). Learning to observe: Using video to improve preservice mathematics teachers' ability to notice. *Journal of Mathematics Teacher Education, 11*(2), 107–125. doi:10.1007/s10857-007-9063-7

Stenhouse, L. (1975). *An introduction to curriculum research and development*. London, England: Heinemann.

Stephen, N. E., & Brendan, J. B. (2016). Opportunity to learn. *Oxford Handbooks Online*. doi:10.1093/oxfordhb/9780199935291.013.70

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. doi:10.1177/0022487115574103

Sykes, G., & Burian-Fitzgerald, M. (2004). Cultivating quality in teaching: A brief for professional standards. In F. Hess, A. Rotherham, & K. Walsh (Eds.), *A qualified teacher in every classroom* (pp. 177–199). Cambridge, MA: Harvard Education Press.

Säntti, J., Rantala, J., Salminen, J., & Hansen, P. (2014). Bowing to science: Finnish teacher education turns its back on practical schoolwork. *Educational Practice and Theory, 36*(1), 21–41. doi:10.7459/ept/36.1.14_03

Thompson, J., Windschitl, M., & Braaten, M. (2013). Developing a theory of ambitious early-career teacher practice. *American Educational Research Journal, 50*(3), 574–615. Retrieved from http://aer.sagepub.com/content/50/3/574.abstract

Thorsen, K. E. (2012). Læringsaktiviteter og profesjonsorientering – Et utviklingsarbeid i ny grunnskolelærerutdanning [Learning activities and professionalism - A development project in the new basic teacher education]. *Uniped, 35*(02). Retrieved from http://www.idunn.no/ts/uniped/2012/02/laeringsaktiviteter_og_profesjonsorientering_et_utviklings

Tigchelaar, A., & Korthagen, F. (2004). Deepening the exchange of student teaching experiences: Implications for the pedagogy of teacher education of recent insights into teacher behaviour. *Teaching and Teacher Education, 20*(7), 665–679. doi:10.1016/j.tate.2004.07.008

Tirri, K. (2014). The last 40 years in Finnish teacher education. *Journal of Education for Teaching, 40*(5), 600–609. doi:10.1080/02607476.2014.956545

Toom, A., Kynäslahti, H., Krokfors, L., Jyrhämä, R., Byman, R., Stenberg, K., . . . Kansanen, P. (2010). Experiences of a research-based approach to teacher education: Suggestions for future policies. *European Journal of Education, 45*(2), 331–344. doi:10.1111/j.1465-3435.2010.01432.x

Tryggvason, M. T. (2009). Why is Finnish teacher education successful? Some goals Finnish teacher educators have for their teaching. *European Journal of Teacher Education, 32*(4), 369–382. doi:10.1080/02619760903242491

Tucker, E., Viswanathan, M., & Walford, G. (2010). Reflections on social measurement: How social scientists generate, modify, and validate indicators and scales. In G. Walford, E.

Tucker, & M. Viswanathan (Eds.), The SAGE Handbook of Measurement (pp. 1–7). London, England: SAGE Publications Ltd. doi:10.4135/9781446268230

Ulvik, M. (2014). Student-teachers doing action research in their practicum: Why and how? *Educational Action Research, 22*(4), 518–533. doi:10.1080/09650792.2014.918901

Ulvik, M., & Riese, H. (2016). Action research in pre-service teacher education – A never-ending story promoting professional development. *Professional Development in Education, 42*(3), 441–457. doi:10.1080/19415257.2014.1003089

Valli, L. (1997). Listening to other voices: A description of teacher reflection in the United States. *Peabody Journal of Education, 72*(1), 67–88. Retrieved from http://www.jstor.org/stable/1493261

van Es, E. A., & Sherin, M. G. (2008). Mathematics teachers' "learning to notice" in the context of a video club. *Teaching and Teacher Education, 24*(2), 244–276. doi:10.1016/j.tate.2006.11.005

van Veen, K. (2013). The knowledge base of teacher educators. In M. Ben-Peretz, S. Kleeman, R. Reichenberg, & S. Shimoni (Eds.), *Teacher educators as members of an evolving profession* (pp. 25–41). Lanham, MD: Rowman & Littlefield.

Vaughan, M., & Burnaford, G. (2016). Action research in graduate teacher education: A review of the literature 2000–2015. *Educational Action Research, 24*(2), 280–299. doi:10.1080/09650792.2015.1062408

Walliman, N. S. R. (2011). *Research methods: The basics*. London, England: Routledge.

Weber, M. (1949). Objectivity in social science and social policy (E. A. Shils & H. A. Finch, Trans.). In E. A. Shils & H. A. Finch (Eds.), *Methodology of social sciences* (pp. 49–112). New York, NY: Free Press. (Archiv für Sozialwissenschaft und Sozialpolitik, 1904).

Westbury, I., Hansén, S.-E., Kansanen, P., & Björkvist, O. (2005). Teacher education for research-based practice in expanded roles: Finland's experience. *Scandinavian Journal of Educational Research, 49*(5), 475–485. doi:10.1080/00313830500267937

Windschitl, M., Thompson, J., Braaten, M., & Stroupe, D. (2012). Proposing a core set of instructional practices and tools for teachers of science. *Science Education, 96*(5), 878–903. doi:10.1002/sce.21027

Wæge, K., & Haugaløkken, O. K. (2013). Research-based and hands-on practical teacher education: An attempt to combine the two. *Journal of Education for Teaching, 39*(2), 235–249. doi:10.1080/02607476.2013.765195

Yin, R. K. (1994). *Case study research: Design and methods*. Thousand Oaks, CA: Sage.

Zeichner, K. M. (2005). A research agenda for teacher education. In M. Cochran-Smith & K. M. Zeichner (Eds.), *Studying teacher education. The report of the AERA panel on research and teacher education* (pp. 737–760). Mahwah, NJ: Lawrence Erlbaum Associates.

Zeichner, K. M. (2008). Introduction: Settings for teacher education. In M. Cockran-Smith, S. Feiman-Nemser, J. McIntyre, & K. E. Demers (Eds.), *Handbook of research on teacher education. Enduring Questions in Changing Contexts* (3rd ed., pp. 263–268). New York, NY: Routledge.

Zeichner, K. M. (2010). Rethinking the connections between campus courses and field experiences in college- and university-based teacher education. *Journal of Teacher Education, 61*(1–2), 89–99. doi:10.1177/0022487109347671

Zeichner, K. M. (2012). The turn once again toward practice-based teacher education. *Journal of Teacher Education, 63*(5), 376–382. doi:10.1177/0022487112445789

Zeichner, K. M. (2016). The changing role of universities in US teacher education. In B. Moon (Ed.), *Do universities have a role in the education and training of teachers? An international analysis of policy and practice* (pp. 107–126). Cambridge, England: Cambridge University Press.

Zeichner, K. M., & Liston, D. P. (2014). *Reflective teaching: An introduction*. New York, NY: Routledge.

Zeichner, K. M., & Noffke, S. E. (2001). Practitioner research. In V. Richardson (Ed.), *Handbook of research on teaching* (pp. 298–330). Washington, DC: American Educational Research Association.

Zeichner, K. M., & Tabachnick, B. R. (1983). *Teacher perspectives in the face of institutional press*. Paper presented at the Annual meeting of the American Educational Research Association, Montreal. http://files.eric.ed.gov/fulltext/ED240113.pdf

Østern, A.-L. (2016). Responding to the challenge of providing stronger research base for teacher education: Research discourses in the Norwegian national research school for teacher education. *Educational Research, 58*(1), 73–90. doi:10.1080/00131881.2015.1129116

Appendices

Appendix 1: Dimensions of Opportunities to Learn that are Grounded in Practice in Teacher Education Coursework

Opportunities to…	Description of dimension
1. plan for teaching & teacher role(s)	The extent to which candidates have opportunities in the class to plan lessons or units, or to develop instructional materials and resources.
2. practice and rehearse teaching & teacher role(s)	The extent to which candidates have opportunities in the class period to practice, rehearse, or approximate elements of practice. This includes practice leading a whole-class or small-group discussion, role-playing a discussion with a pupil, rehearsing an introduction to a lesson, or participating in a fishbowl discussion taking the 'part' of a pupil or a teacher.
3. analyze pupils' learning	The extent to which candidates have opportunities to practice analyzing pupil learning; to examine or analyze K-12 pupil work; to work with pupils and analyze their skills, abilities, or needs; or to look at classroom transcripts or videos and examine and analyze pupil learning.
4. include teaching materials, artifacts, and resources	The extent to which the candidates have opportunities to use, discuss, or analyze artifacts or resources from real classrooms and teaching, including video of teachers, cases about teaching and teachers, samples of real K-12 pupil work, and transcripts of classroom talk.
5. talk about field placement	The extent to which candidates have opportunities to discuss or relate what they are discussing or doing in class to their own fieldwork or student-teaching (e.g., bring in their own pupils' work, or discuss or describe experiences from their own observations of classrooms or student-teaching).
6. take the pupils' perspective	The extent to which candidates have opportunities to do work that their own pupils will or might do. For example, candidates might read texts their pupils will read or solve problems they will solve. This also includes the extent to which candidates have opportunities to more broadly take the perspective of pupils (in terms of learning styles, adolescent perspectives and concerns, pupils' needs and strengths).
7. see models of teaching	The extent to which candidates have opportunities to see their teacher educators explicitly modeling the kinds of practices discussed in class (e.g., instructors model: a good lecture for K-12 pupils, groupwork, or giving good feedback).
8. see connection to national or state curriculum	The extent to which candidates have opportunities to read, review, critique, or analyze materials or resources specific to the national, state, or local context. For instance, they might read or analyze national, state, or local curriculum, or read or analyze local regulations related to teacher evaluation or standards.

Appendix 2: Coding Book, Observation Data

The scores from 1 to 4 reflect both quantitative and qualitative aspects of the opportunities the teacher candidates have; the inclusion of "and/or" in the definition of all scores signals this. If all aspects of a definition of a specific score are not present, the score is lowered by 1.

Dimension 1. Opportunities to plan for teaching & teacher role(s)

The extent to which candidates have opportunities in the class to plan lessons or units, or to develop instructional materials and resources.

1	2	3	4
The teacher candidates have no opportunities to plan for teaching and teacher role(s).	The teacher candidates have few opportunities to plan for teaching and teacher role(s). If they have opportunities to explore these roles, it is within a limited time span, meaning it is only briefly connected to and/or It is outlined, connected to, or referred to in generic terms. E.g., aspects of planning like backwards planning, the concept of unit plans or learning goals/essential questions are mentioned or connected to, either by a teacher candidate or by the teacher educator.	The teacher candidates have more opportunities to plan for teaching and teacher role(s). They spend more time on planning, meaning more than a brief mentioning, but it is still not (one of) the main topic(s) of the lesson and/or The dimension is to some extent specific and concretely targeted. The candidates get an overview of a topic, or they get relatively deep insight in a limited part of the topic and how to plan for it. E.g., the teacher candidates are asked to brainstorm about possible ways to plan for a topic or for specific groups of pupils, or they get somewhat more directed and specified assignments to explore or create instructional materials or resources, even though they might not get all through their discussions and questions regarding the matter and without this necessarily being the main focus of the session or without it being thoroughly treated.	The teacher candidates spend a major portion of the session planning for teaching and teacher role(s) and It is specific and concretely targeted. The candidates are asked to work thoroughly to explore, analyze, and describe planned units in detail and connect it to the topic of the lesson/theory/research. E.g., planning is central to the whole design of the session; the teacher candidates spend a significant period of time going in depth on matters concerning how to teach or assess a specific unit or topic; the teacher candidates create instructional materials or resources; they are asked to connect to theory about the process of planning; they are asked to present a final product of their planning.

Scoring rule:

- If the candidates have many opportunities to learn about planning for teaching by listening to a lecture or through a classroom discussion on aspects of planning, but the candidates are not doing the actual planning, the result is not a high score (most likely 2).

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Dimension 2. Opportunities to practice and rehearse teaching & teacher role(s)

The extent to which candidates have opportunities in the class period to practice, rehearse, or approximate elements of practice. This includes practice leading a whole-class or small-group discussion, role-playing a discussion with a pupil, rehearsing an introduction to a lesson, or participating in a fishbowl discussion taking the 'part' of a pupil or a teacher.

1	2	3	4
The teacher candidates have no opportunities to practice or rehearse teaching and teacher role(s).	The teacher candidates have few opportunities to practice or rehearse teaching and teacher role(s). If they have opportunities to rehearse, it is within a very limited time span and/or It is not explicitly reflected upon or related to the overall topic of the lesson. E.g., the teacher candidates are asked to role-play different ways to answer a question from a pupil.	The teacher candidates have more opportunities to practice or rehearse teaching and teacher role(s). They spend more time rehearsing, meaning they get to experience different aspects of what they are rehearsing or obtain relatively deep insight into what they are rehearsing. However, this is not explicitly reflected upon or related to the overall topic of the lesson and/or A brief rehearsal is more specific and concretely targeted, and it is explicitly reflected upon or related to the overall topic of the lesson. E.g., the teacher candidates are asked to hold a mini-lesson on a specific topic, or they are role-playing a specific method.	The teacher candidates have more opportunities to practice or rehearse teaching and teacher role(s). They spend a sufficient amount of time rehearsing to experience different aspects of what they are rehearsing or to get relatively deep insight into what they are rehearsing and The rehearsal is more specific and concretely targeted; it is explicitly reflected upon and related to the overall topic of the lesson. E.g., the teacher candidates are role-playing a specific method and reflect upon the method's impact on pupils' learning.

103

Dimension 3. Opportunities to analyze pupils' learning

The extent to which candidates have opportunities to practice analyzing pupil learning; to examine or analyze K-12 pupil work; to work with pupils and analyze their skills, abilities, or needs; or to look at classroom transcripts or videos and examine and analyze pupil learning.

1	2	3	4
The teacher candidates have no opportunities to analyze pupil learning.	The teacher candidates have few opportunities to analyze pupil learning. If they have opportunities to analyze pupil learning, it is only briefly touched upon, meaning it is focused upon within a limited time span and/or It is referred to in generic terms. E.g., the teacher educator or the teacher candidates briefly mention that a pupil did or did not understand something after looking at a video or discussing field experience, but this is not the topic for the session or they are not specific about why the pupil did not understand.	The teacher candidates have more opportunities to analyze pupil learning. They spend more time on analyzing pupil learning, meaning more than a brief mentioning, but it is still not (one of) the main topic(s) of the lesson and/or The candidates get an overall, or superficial, understanding of pupil learning, or they get partly specific insight into a limited part of the students' understanding. E.g., the teacher candidates analyze their peers' or pupils' work or transcripts or videos of teaching to get an understanding of the strengths and weaknesses of the pupils' performances as they are.	The teacher candidates spend a major portion of the session analyzing pupil learning and It is very specific and concretely targeted. In addition to the description on level 3, to reach a level 4, the analysis must contribute to understanding the specific pupil's strengths and weaknesses or misconceptions or provide an overview of typical errors or misconceptions (also related to the appropriate learning targets in the national, state, or local curriculum). The analysis could also contribute to reflections/discussions on next steps of teaching and/or be connected to theory about feedback and assessment.

Dimension 4. Opportunities to include teaching materials, artifacts, and resources

The extent to which the candidates have opportunities to use, discuss, or analyze artifacts or resources from real classrooms and teaching, including video of teachers, cases about teaching and teachers, samples of real K-12 pupil work, and transcripts of classroom talk.

1	2	3	4
The teacher candidates have no opportunities to include teaching materials, artifacts, and resources.	The teacher candidates have few opportunities to include teaching materials, artifacts, and resources. If they have opportunities to do so, the artifacts are provided only as examples they can look at, and they may be briefly mentioned or connected to.	The teacher candidates have more opportunities to include teaching materials, artifacts, and resources. They spend more time on the artifacts, meaning more than a brief mentioning of them as an example, without them being (one of) the main activities of the lesson. The lesson may include too many artifacts, which becomes confusing for the teacher candidates and/or The artifacts are to some extent more specific and concretely targeted, but the candidates are still not asked to work on them thoroughly, such as to analyze, criticize, adapt, or improve them. E.g., the teacher candidates are asked to read or solve texts or assignments that their pupils would use; they are given time to read and discuss unit plans, assignments, or rubrics related to a specific topic; the teacher educator outlines an artifact connected to the topic of the class in greater detail, even though they might not get all through their discussions and questions regarding the matter.	The teacher candidates spend a major portion of the session working on teaching materials, artifacts, and resources and The inclusion of teaching materials, artifacts, and resources serves a very specific and concretely targeted purpose, and the candidates analyze, criticize, adapt, or improve them, or use them as a starting point to develop other material. Their discussions are connected to the topic of the lecture or to research or theory on the topic or on the type of artifact that they are working on. E.g., The inclusion of teaching materials, artifacts, and resources is central to the whole design of the lecture; the teacher candidates spend a significant period of time going in depth and analyzing a unit plan, assignment, or rubric related to a specific topic or theory, going more in detail into questions and discussions regarding this topic and also the artifact itself.

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Dimension 5. Opportunities to talk about field placement

The extent to which candidates have opportunities to discuss or relate what they are discussing or doing in class to their own fieldwork or student-teaching (e.g., bring in their own pupils' work, or discuss or describe experiences from their own observations of classrooms or student-teaching).

1	2	3	4
The teacher candidates have no opportunities to talk about field placement or student-teaching experiences.	The teacher candidates have few opportunities to talk about field placement or student-teaching experiences. If they have opportunities to talk about field placement or student-teaching experiences, it is focused upon within a limited time span, meaning it is briefly touched upon or connected to and/or Field placement or student-teaching experiences are referred to in generic terms. E.g., general aspects of their field experience are briefly mentioned or connected to the topic of the class, either by a teacher candidate or by the teacher educator; the teacher candidates are briefly connecting to a specific episode relevant to the topic of the class; or they connect to aspects of their field experience that are less relevant for their professional learning.	The teacher candidates have more opportunities to talk about field placement or student-teaching experiences. They spend more time talking about their field placement, meaning more than a brief connection, but without it being (one of) the main activities of the lesson and/or The talk is to some extent specific and concretely targeted, but the candidates are not analyzing their experiences related to the topic of the class in depth. E.g., the teacher candidates are asked to brainstorm about their experiences connected to the topic of the class but without explicit reflection on this connection, or without going into details on the results of the brainstorming of the candidates.	The teacher candidates spend a great portion of the session talking about their field placement or student-teaching experiences and The talk is very specific and concretely targeted, and the candidates have opportunities to analyze their experiences related to the topic of the class or theory/research on the matter. E.g., the teacher candidates are specifically asked to connect their experiences to the topic of the day/readings they have done or a specific theory on the topic; they are asked to look at their own pupils' work to assess it, feed forward, or plan next steps; or they are working on and/or getting feedback on plans, assignments, or rubrics that they are going to use in their own placements.

Scoring rules:

- When the teacher educator talks about his or her own teaching experience, this is not scored as dimension 5.
- When candidates talk about their own experiences as pupils, this is not scored as dimension 5.

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Dimension 6. Opportunities to take the pupils' perspective

The extent to which candidates have opportunities to do work that their own pupils will or might do. For example, candidates might read texts their pupils will read or solve problems they will solve. This also includes the extent to which candidates have opportunities to more broadly take the perspective of pupils (in terms of learning styles, adolescent perspectives and concerns, pupils' needs and strengths).

1	2	3	4
The teacher candidates have no opportunities to take the pupils' perspective.	The teacher candidates have few opportunities to take the pupils' perspective. If they have opportunities to do so, it is focused upon within a limited time span, meaning it only happens briefly and/or The activity is not necessarily explicitly connected to the topic, theory, or readings, or it is not reflected upon. E.g., the teacher candidates are briefly asked what they believe pupils would think about something or how they would understand something; or they are briefly asked to read a problem or text that their pupils would read or do, but without going in depth or discussing it.	The teacher candidates have more opportunities to take the pupils' perspective. They spend more time taking the pupils' perspective, meaning more than a brief connection, but without it being (one of) the main activities of the lesson and/or To some extent, the teacher candidates are taking the pupils' perspective in a more specific and concretely targeted way. The activity is indirectly connected to the topic of the lesson. E.g., the teacher candidates are asked to solve a problem or assignment that their pupils would do, even though they might not get all through their discussions and questions regarding the matter, but without this being the main focus of the session or without it being thoroughly treated.	The teacher candidates spend a major portion of the session taking the pupils' perspective and It is very specific and concretely targeted. The activity is explicitly connected to the topic, theory, or readings and reflected upon. E.g., the teacher candidates are asked to solve a problem or assignment that their pupils would do, and they get opportunities to reflect upon this related to the topic, theory, or readings; they might be asked to alter an assignment based upon this reflection.

Scoring rule:

- Generic discussions on differentiation or talk about differentiation for specific (groups of) pupils are not scored as dimension 6.

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Dimension 7. Opportunities to see models of teaching			
The extent to which candidates have opportunities to see their teacher educators explicitly modeling the kinds of practices discussed in class (e.g., instructors model: a good lecture for K-12 pupils, groupwork, or giving good feedback).			
1	2	3	4
The teacher candidates have no opportunities to explore this dimension.	The teacher candidates have few opportunities to see models of teaching. Any opportunities occur within a limited time span, meaning it is briefly touched upon, or connected to and/or The teacher educator briefly comments that he or she is exemplifying or modeling good practice. E.g., The teacher educator says in passing what a good way to group pupils could be.	The teacher candidates have more opportunities to see models of teaching. They spend more time on the dimension, meaning more than a brief connection, but without it being (one of) the main activities of the lesson. and/or To some extent, the modeling is more specific and concretely targeted; the teacher educator is explicitly saying that he or she is modeling, but it is not necessarily discussed or reflected upon after. E.g., the teacher educator is saying explicitly that he or she will model how to create groups, or ask good questions, and does so.	The teacher candidates spend a major portion of the session seeing models of teaching and It is very specific and concretely targeted. The teacher educator is explicitly saying that he or she is modeling, and it is discussed or reflected upon afterwards, connected to theory, readings, or the topic of the lesson. E.g., the teacher educator spends a major part of the lesson modeling a method of teaching connected to the topic of the lesson and asks the candidates to reflect upon or discuss it afterwards.

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Dimension 8. Opportunities to see connection to national or state curriculum

The extent to which candidates have opportunities to read, review, critique, or analyze materials or resources specific to the national, state, or local context. For instance, they might read or analyze national, state, or local curriculum, or read or analyze local regulations related to teacher evaluation or standards.

1	2	3	4
The teacher candidates have no opportunities to see connection to national, state, or local context or curriculum.	The teacher candidates have few opportunities to see connection to national, state, or local context or curriculum. If they have such opportunities, it is focused upon within a limited time span, meaning it happens briefly and only once and/or It is referred to in generic terms. E.g., it is briefly mentioned, either by a teacher candidate or by the teacher educator; or it is cited on a handout or PowerPoint, but without being explicitly referred to.	The teacher candidates have more opportunities to see connection to national, state, or local context or curriculum. They might spend more time on the dimension, meaning more than one brief connection, but without it being (one of) the main activities of the lesson and/or It is referred to in specific or generic terms. E.g., several times during the lesson, it is briefly mentioned, either by a teacher candidate or by the teacher educator; or several times during the lesson, it is cited on a handout or PowerPoint, but without being explicitly referred to.	The teacher candidates have even further opportunities to see connection to national, state, or local context or curriculum. They might spend a majority of the lesson working on it, but it might also be only several specific, but brief, connections to it throughout the (part of the) lesson and It is connected to the topic of the lesson, theory, or readings. E.g., the teacher candidates spend some time reading, discussing, or analyzing national, state, or local context or curriculum; the teacher educator might outline specific parts of it connected to the topic of the lesson; it serves as the backdrop for a whole session of planning, etc.; it is briefly mentioned or connected to throughout the lesson.

Scoring rules:

- Discussions on national or international testing are not scored as dimension 8.

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Appendix 3: Teacher Education Survey

UiO : **Department of Teacher Education and School Research**
Faculty of Educational Sciences

Teacher Education Survey

This survey is being conducted to help us better understand the nature of your preparation for teaching, and your experiences as prospective teachers. As part of our work, we are trying to identify what features of your teacher education program experiences might be most effective in improving your learning about teaching. Your participation is important and will help us understand better the features that prepare teachers to teach well. You can leave blank any questions you do not wish to answer.

THANK YOU VERY MUCH FOR TAKING THE TIME TO COMPLETE THIS SURVEY!

1. Male ☐

2. Female ☐

My age is:

☐ Years

My major subject for teaching is:

1. Mathematics ☐

2. Science ☐

3. History/Social science ☐

4. English Language art ☐

5. World languages ☐

6. Other ☐

Today's date is: ☐

1. In your Curriculum and Instruction courses, how much *opportunity* did you have to do the following?

Please mark one answer on each row

	None	Touched on it briefly	Explored in some depth	Extensive oppor-tunity
a. Plan for teaching (develop unit plans, or lesson plans, develop instructional materials)	1	2	3	4
b. Practice or rehearse something you planned to do in your K-12 classroom, in this course (i.e. role play or practice an introduction to a lesson you plan to teach; practice giving feedback to a student)	1	2	3	4
c. Examine samples of K-12 student work	1	2	3	4
d. Examine samples of your own students' work	1	2	3	4
e. Examine actual teaching materials (sample curriculum, units, lessons, from real teachers)	1	2	3	4
f. Examine national/state/local/professional curriculum/standards/guidelines	1	2	3	4
g. Examine transcripts of real K-12 classroom talk or student discussions	1	2	3	4
h. Watch or analyze videos of classroom teaching	1	2	3	4
i. Discuss experiences from your own student teaching (field work) in your university classes	1	2	3	4
j. Experience your teacher educator modeling/demonstrating effective teaching practices	1	2	3	4
k. Read, analyze or discuss 'broad' educational theory (foundational theory about teaching and learning, adolescent development, e.g. Vygotsky, Piaget, Bruner)	1	2	3	4
l. Read, analyze and discuss educational theory that is *specific* to your subject matter (i.e. research on teaching math/language arts/ history/social science/languages or other subjects)	1	2	3	4
m. Read, discuss or analyze theory *in* your subject matter theory (i.e. literary theory/mathematical ideas/historical analyses/theories within natural science or social science/languages etc.)	1	2	3	4
n. Use theory that you are reading in class, to analyze or examine your own experiences as a classroom student-teacher	1	2	3	4
o. Solve problems, read texts, or do actual work that your own pupils will do	1	2	3	4
p. Read, analyze and discuss general research methods (how to conduct educational research, about qualitative or quantitative research, about survey or case study methods, etc.)	1	2	3	4
q. Read, analyze and discuss research methods you can use in investigating student learning or other questions in your own classroom (how to do 'action research' or 'inquiry' in your classroom)	1	2	3	4
r. Learn about general research methods (how to conduct educational research, about qualitative or quantitative research, about survey or case study methods, etc.)	1	2	3	4
s. Learn about research methods you can use in investigating student learning or other questions in your own classroom (how to do 'action research' or 'inquiry' in your classroom)	1	2	3	4

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2. During your entire experience with the teacher education program, how much opportunity did you have to do the following?

Please mark one answer on each row

	None	Touched on it briefly	Explored in some depth	Extensive Oppor- tunity
a. Learn about the vision of good teaching that your teacher education program promotes	1	2	3	4
b. Connect ideas from one class to another in the same course	1	2	3	4
c. Connect ideas from one course to those in another	1	2	3	4
d. Trace your own trajectory of learning—reflect upon the ways your own understanding of teaching and learning was developing	1	2	3	4
e. Make connections between educational theory and the actual classroom teaching you were engaged in	1	2	3	4

3. In thinking about your teacher education program *so far*, how much do you agree or disagree with the following statements?

Please mark one answer on each row

	Strongly Disagree	Disagree	Agree	Strongly Agree
a. The program articulated a clear vision of teaching and learning	1	2	3	4
b. I heard similar views about teaching and learning across the program courses	1	2	3	4
c. The faculty knew what was happening in my other courses (i.e. assignments, readings, key ideas)	1	2	3	4
d. My courses within the teacher education program seemed to be intended to build an understanding over time	1	2	3	4
e. When ideas or readings were repeated in my courses, they were elaborated / treated more deeply	1	2	3	4
f. I saw connections among ideas, and concepts across program courses	1	2	3	4
g. What I learned in my fieldwork conflicted with what I learned in my coursework	1	2	3	4
h. My student teaching experience allowed me to try out the theories, strategies and techniques I was learning in my classes at the teacher education program	1	2	3	4

PLEASE TURN THE PAGE!

i. What I learned in my courses reflects what I observed in field experiences	**1**	**2**	**3**	**4**
j. The faculty was knowledgeable about the program as a whole	1	2	3	4
k. In my fieldwork I observed teachers using the same theories, strategies and techniques I was learning about in my courses at the teacher education program	**1**	**2**	**3**	**4**
l. The faculty made explicit references to other courses	1	2	3	4
m. The faculty was knowledgeable about what I was required *to do* in my field teaching experience	**1**	**2**	**3**	**4**
n. The faculty was knowledgeable about the *quality and nature* of my field teaching experiences	1	2	3	4

Thank you again for your time!

Kirsti Klette

Karen Hammerness

Ole Kristian Bergem

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Appendix 4: Admission Requirements and Criteria for Deciding Readiness to Teach Across the Programs

Program	Admission requirements*	Criteria for deciding readiness to teach*
Helsinki	Moderate	Moderate
Aabo	Moderate	Moderate
Oslo	Low	Low
NTNU	Low	Low
Stanford	High	High
UCSB	High	High

Note. *The degree (low, moderate, or high) signifies relativity to the other programs in our sample.

Stanford and University of California, Santa Barbara (UCSB) had quite extensive requirements for admission, with standardized entrance exams, interviews, and various essays or letters of recommendation. The Norwegian programs had rather limited requirements, asking only for their students' credits or grades on their bachelor degree or their secondary schooling. The Finnish programs were somewhat in between with a moderate level of requirements of admission.

The level of criteria for deciding readiness to teach indicates how extensively the programs assessed their candidates; specifically, this measure includes all compulsory assignments, exams, tests, tasks, practices, evaluations, and certifications the candidates need to pass or obtain to be qualified to teach. The main difference between the programs in this regard was whether the candidates were required to achieve a national or regional credentials. This was only the case for the Californian programs, where the candidates had to complete the Performance Assessment for California Teachers (PACT). The PACT is a very extensive and explicit documentation of what the candidates have learned. The other programs also had some kind of exam or compulsory assignments, but they were less extensive. The Norwegian programs seemed to have the least extensive arrangements, while the Californian programs had more assignments throughout the courses for their candidates. Also, all programs had some kind of assessment of their candidates' teaching practice, but they differed in the extent to which the candidates were assessed and by whom. The Norwegian programs tended to have less contact between faculty and the candidates and cooperating teachers while their candidates were in placements, while the Californian programs had more supervision by faculty.

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Appendix 5: Comparative Table[11]

	Term	Total credits	Methods courses	Other courses	Fieldwork
Helsinki	1-2	60	Didactics of mathematics/language arts (5)	General and applied pedagogy (13) Special needs pedagogy (2)	
	3-4				Introductory practice (5)
	5-6		Extended didactics of mathematics/language arts (5)	Motivation and learning (4) The voice as an pedagogical resource (1)	Field practice (5)
	7-10		Subject didactical theory and practice of mathematics/language arts I (10) Subject didactical theory and practice of mathematics/language arts II (10)		
Aabo	1-2	60	Didactics of mathematics/language arts (5)	General and applied pedagogy (13) Special needs pedagogy (2)	
	3-4				Introductory practice (5)
	5-6		Extended didactics of mathematics/language arts (5)	Motivation and learning (4) The voice as an pedagogical resource (1)	Field practice (5)
	7-10		Subject didactical theory and practice of mathematics/language arts I (10) Subject didactical theory and practice of mathematics/language arts II (10)		
Oslo	1	60	Didactics of mathematics/language (15) (the students with two subjects have two courses, 15 credits in total)	Pedagogics, (15) Integrated lectures and seminars (foundations and subject didactics) Methodology lectures Micro teaching course	4 weeks full time (1+3 weeks for math students)
	2		Didactics of mathematics/language (15) (the students with two subjects have two courses, 15 credits in total)	Pedagogics, (15) Integrated lectures and seminars (foundations and subject didactics)	8 weeks full time (3+5 weeks

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[11] Numbers in parenthesis signifies credits or units. The Norwegian and Finnish credits are directly comparable; the Californian units are not comparable to each other, neither to the Nordic credits.

				Methodology lectures	for math students)
NTNU	1	60	Didactics of mathematics/language (15) (the students with two subjects have two courses, 15 credits in total)	Pedagogics, 15 credits Integrated didactical course Micro teaching course	6 weeks full time
	2		Didactics of mathematics/language (15) (the students with two subjects have two courses, 15 credits in total)	Pedagogics, 15 credits Integrated didactical course "Outside schooling"	8 weeks full time
Stanford	1	48	Curriculum & Instruction (2)	Centrality of Literacies in Teaching and Learning (3) Educating for Equity And Democracy (2) Secondary Teaching Seminar (Practicum) (3)	Full time
	2		Curriculum & Instruction (3)	Adolescent Development & Learning (5) Classroom Management & Leadership(2) Secondary Teaching Seminar (Practicum) (5) Teaching and Learning in Heterogeneous Classrooms (3)	Full time
	3		Curriculum & Instruction (3)	Secondary Teaching Seminar (Practicum) (5) Language Policies & Practice (2)	Full time
	4			Secondary Teaching Seminar (Practicum) (2-7) Supporting Students with Special Needs (3) Elective in Education or a teaching subject (1-5)	Full time placement
UCSB	1	59	Professional Issues in Teaching Mathematics/English (1) Secondary Mathematics/English Methods (1)	Practicum in Classroom Management (2) Writing Project (4) Language and Culture in Teaching and Learning (4) Adolescent Development and Learning (4) Foundations of Teaching (4) Foundations in Academic Language (2)	8 weeks, 3 days a week
	2		Professional Issues in Teaching Mathematics/English (1) Secondary Mathematics/English Methods (3) Methods and Procedures (1)	Teacher inquiry & research (1 unit) Applications of Computers to Education (4) Reading and Writing in Content (4) Instructional Design (1) Contexts for Adolescent Development and Learning (2)	8 weeks, 3 days a week
	3		Professional Issues in Teaching Mathematics/English (1) Methods and Procedures (1)	Teacher inquiry & research (1) Applications of Computers to Education (4) Reading and Writing in Content (4)	Full time placement

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					Instructional Design (1) Exceptional Adolescents, Inclusive Classrooms (4)	
	4			Professional Issues in Teaching Mathematics/English (1) Methods and Procedures (1) Mathematics Development in Adolescents (4) or Applied Rhetoric, Poetics, & Linguistics	Teacher inquiry & research (1) Special Topics in the Teaching Profession (3)	Full time placement

Appendix 6: Characteristics of the Observation Data

Program	Period of observation	Hours of observation		Sampled course	Structure of the methods course in Mathematics	Structure of the methods course in Language Arts
		M*	LA*			
Helsinki	September-October 2014	12	12	**Extended didactics of Mathematics/ Language arts.** The course with the most subject didactical focus in the year of the program with the most focus on the teaching profession	Curriculum translated to textbook; Language of mathematics; Teaching concepts; Interaction; Calirty and activities, games; Learning difficulties in mathematics; Technology in teaching mathematics; Textbook analysis; Developing a lesson plan; Micro teaching I and II; Teaching mathematics in vocational education	Book trailer project and other course assignments. National Core Curriculum; Finnish as second language; Discussion on school observation period & workshop on book trailers; Teaching grammar; Teaching literature; Presentations of unit plans;
Aabo	March - April 2013	6	8	**Extended didactics of Mathematics/ Language arts.** The course with the most subject didactical focus in the year of the program with the most focus on the teaching profession	Data missing	Introduction to portfolio; View of subject; Literature didactics; Cooperation in teacher education; Extended understanding of text; Drama didactics; Language of the media; National curriculum and assessment; Development of reading and writing; Digital project/Storyline; Didactics of grammar; Digital resources; Multiculturalism and – languages; School visit; International and national assessment; Assessment; Didactics of neighboring countries; Presentations of portfolio; Assessment

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Oslo	November 2012 and February 2013	6	4,5	**Didactics of Mathematics/ Norwegian.** The only required methods course in that subject.	What is mathematics didactics; Methods, discovery learning; Learning theories; Core practices in mathematics; Unit planning; Teacher's competence in mathematics; Development of mathematical understanding?; Activities in mathematics teaching; History of mathematics; Assessment; Mathematical learning disabilities; Mathematical modeling; Motivation; Differentiation	Characteristics and history of the Norwegian language; Nonfiction; Reading; Multi modal texts; Reading tests; Oral literacy; Digital literacy; Writing; Assessment; Teaching literature; Multiculturality; Grammar and the second official Norwegian language
NTNU	January 2013	4,5	4,5	**Didactics of Mathematics/ Norwegian.** The only required methods course in that subject	What is mathematics?; Discovery learning; Problem solving; Competence; Digital literacy; Assessment; Material for concretization; Modelling; Geometry; Communication; Unit planning; International tests; Motivation	National curriculum; Language didactics; Oral didactics; Literature- and culture didactics; Written didactics; Assessment; Designing assignments; Rhetoric
Stanford	January 2013	8,5	9	**Curriculum & Instruction in Mathematics/ Language Arts.** The only required methods course in that subject at the time of our observations. Number 3 of 3.	Unit planning: Big ideas; Common core; Evidence of mathematical proficiency; Designing assessments and rubrics; Curricular materials and curriculum adaptation; Designing learning activities; Connecting curriculum & learning activities with students experiences & interests; Facilitating mathematical discussions; Instructional tools: Technology & Manipulatives; Learning from Practice	Unit planning; Essential questions and learning targets; Developing culminating assessments and rubrics; Differentiating instruction; English learners; Drama; Maintaining rigor; Analysis of teaching
UCSB	October-December 2012	15,5	13,5	Methods and Procedures Professional Issues in Teaching Mathematics & Secondary Mathematics Methods/ Secondary	Professionalism; Communication; Practice and observations; Math decimals, ratios and percent; Algebra tiles; Field trip to elementary school; Algebra walk/Trajectories, strategies, big ideas, models and cognitive obstacles for students encountering rich mathematical problems; Interaction of mathematical content and the contexts; California Common Core State Standards	Active reading; Accessing difficult texts in your content; Conceptual approaches to vocabulary instruction; Textbook strategies; Using supplementary texts and online res ources; Writing: Rhetoric and your content; Wac, and assessing writing; Planning effective discussions; Lesson designs and lesson presentations/Timeline, first day revisions, Wirmi; Lesson planning;

| | | | | English Language Arts Methods & Professional Issues in Teaching English Language Arts. The two courses at the time of observation with the most Mathematics/ English didactical focus | | Adolescence; Book reviews; Methods book project; Teaching literature; Assessment; PACT |

*M signifying the subject didactics courses of Mathematics; LA the subject didactics courses of Language Arts.

Part II: The Articles

Article I

Grounding Teacher Education in Practice around the World:

An Examination of Teacher Education Coursework in Teacher Education Programs in Finland, Norway and the United States

Worldwide, teacher educators and policy makers call for teacher preparation that is more deeply linked to practice. Yet we know little about how such linkages are achieved within different international programs. We examine the degree to which programs provide opportunities to learn that are grounded in practice, during university coursework. We report on observation data from the methods courses (n=104 hours) in six programs in Finland, Norway, and California. Using an analytical framework decomposing the conception of 'centering in practice' in teacher education, this article provides evidence regarding the successes—and challenges—concerning incorporating practice in teacher education.

Attention to Practice in Teacher Education: Growing Internationally

Around the world, policy-makers and teacher educators are paying increasing attention to how teacher candidates learn to teach in practice and how to ground teacher education more deeply in the work of classroom instruction (Ball & Cohen, 1999; British Educational Research Association [BERA], 2014; Conway & Munthe, 2015; Darling-Hammond et al., 2017; Donaldson, 2011; Moon, 2016; NCATE, 2010; Zeichner, 2012). Looking across cases of teacher education from countries including Australia, Chile, China, India, South Africa, and Uganda, Moon (2016) noted that basing teacher education within the universities has increased the status and reach of teacher education, but has simultaneously reinforced the divide between theory and practice. Moon (2016) concluded that teacher education needs to embrace practice to enhance its status. Looking across three continents and five countries identified as "high-performing" jurisdictions in terms of student outcomes on PISA, Darling-Hammond et al. (2017) likewise found that increasing linkages to practice in teacher education is a key concern. In response, programs across these jurisdictions are working to connect clinical experiences even more tightly to coursework. These same concerns are also evident in the United States, where a recent Blue Ribbon Panel concluded that the challenges of preparing teachers for 21st-century classrooms require turning teacher education "upside down" so that practice becomes the base for learning to teach (NCATE, 2010, p. ii).

Growing evidence from the United States and the Netherlands has suggested that efforts to tie preparation more closely to practice can have a significant impact on student learning (Boyd, Grossman, Lankford, Loeb, & Wyckoff, 2009; Brouwer & Korthagen, 2005; Darling-Hammond, Chung, & Frelow, 2002). Furthermore, research has indicated that teacher preparation grounded in practice can increase teacher retention (Feiman-Nemser, Tamir, & Hammerness, 2014) and enhance candidates' future practical competence in the classroom (Brouwer & Korthagen, 2005; Darling-Hammond et al., 2002). Teacher educators around the world have undertaken a variety of efforts to make teacher education more "practice-based" (see Forzani, 2015, for a history of these efforts in the US).

Internationally, such strategies include extending the practicum or field placement for student teachers (BERA, 2014; Jakku-Sihvonen & Niemi, 2006; Müller, Álamos, Meckes, & Sanyal, 2015; Norwegian Government, 2014) and placing teachers in school residencies to ensure that most of their learning experiences occur in schools (Boggess, 2008, 2010; Klein, Taylor, Onore, Strom, & Abrams, 2013; Silva, Knechtel, Gleason, & Makowsky, 2014; Solomon, 2009; Taylor & Klein, 2015; Williamson, Hammerness & Kosnick, 2016; Zeichner, 2016). Other efforts include creating explicit partnerships with schools that are specifically focused upon new teachers' learning such as teacher training schools in Finland (Niemi & Jakku-Sihvonen, 2006), university schools in Norway (Lund & Eriksen, 2016), and professional development schools in the United States (Holmes Group, 1995; Ikpeze, Broikou, Hildenbrand, & Gladstone-Brown, 2012; Martin, Snow, & Torrez, 2011; Pepper, Hartman, Blackwell, & Monroe, 2012) or expanding field placements into community-based organizations (McDonald et al., 2011; Zeichner, 2010). Yet, as many teacher educators have argued, becoming more closely connected to practice should not be restricted to school sites or the practicum (Ball & Cohen, 1999; Britzman, 2003; Kennedy, 1999; Zeichner, 2010). Ball and Cohen (1999) argued for a conception of centering professional learning in practice that expands beyond learning on site in school placements. From their perspective, coursework and university-based experiences are also critical arenas for such linkages.

Despite this growing international emphasis, Boyd et al. (2009) found that candidates' opportunities to learn were rarely grounded in practice. Few studies have examined this issue, so numerous questions remain: To what extent are teacher education programs in different countries centered in practice? How and where in candidates' coursework are those connections made? Are there particular kinds of connections that teacher education candidates encounter more often in some programs and national settings than others?

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Building upon calls for more international research in teacher education (Cochran-Smith et al., 2016; LeTendre & Wiseman, 2015), this article focuses on the question: *In what ways is candidates' coursework grounded in practice across programs in different national settings?* To answer, we provide data regarding how teacher education coursework is grounded in practice in three different national contexts (i.e., Finland, Norway, and California). We use classroom observations of teacher education methods courses[12] of mathematics and language arts in two programs in each context to compare candidates' opportunities to learn and to explore the ways in which these programs did—or did not— draw upon representations of practice in coursework.

Conceptualizing Coursework Grounded in Practice

What might it look like for programs to ground coursework in classroom practice? In identifying indicators of practice-centered coursework that might be present in these different international settings, we drew upon research that has been investigating ways to help new teachers learn to decompose and enact actual classroom practices ("high leverage" or "core practices" in teacher education; e.g., Ball & Forzani, 2009; Grossman et al., 2009; McDonald, Kazemi, & Kavanagh, 2013) as well as research on specific aspects of classroom work such as lesson planning (Kunzman, 2002). We also drew from research on using artifacts and representations of teaching and student learning in teacher education (Ball & Cohen, 1999; Boyd et al., 2009; Ghousseini & Sleep, 2011; Hiebert, Morris, Berk, & Jansen, 2007; Kazemi & Franke, 2004; Lampert et al., 2013; Windschitl, Thompson, Braaten, & Stroupe, 2012).

Due to the exploratory nature of our study and questions about how well indicators drawn from scholarship based heavily in the United States might transfer to different contexts, we sought to capture what might be universal representations of practice across very different international settings. For that reason, we chose not to look for specific, finer-grained teaching practices such as organizing a whole-class discussion (Edwards-Groves & Hoare, 2012; Grossman, Loeb, Cohen, & Wyckoff, 2013) or setting a classroom climate and conducting behavioral management (Pianta & Hamre, 2009) because they might be more specific to an American context. For an initial, comparative exploratory study, we felt our investigation needed to focus on the features most likely to be shared across settings and that had the most potential to resonate across different programs. The framework we developed rests upon a view of teaching practice as complex, situated, and instantaneous; as such,

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[12] The term *methods courses* in this article signifies subject-specific pedagogical courses within the teacher education program. These may be termed *curriculum and instruction courses, pedagogical content knowledge courses*, or, in a Nordic or European context, *subject didactical courses.*

teaching practice can be learned and developed over time with sufficient scaffolding and support. The eight dimensions that constitute our conceptual and analytical framework are not conclusive, but rather a starting point for examining how teacher education coursework is grounded in practice.

Plan for teaching and teacher role(s). Scholarship on teacher education has revealed that *planning* is a key strategy for learning to teach and connecting to practice (Grossman et al., 2009; Kunzman, 2002; Windschitl et al., 2012). Windschitl et al. (2012) identified planning as a core practice of teaching, and they developed a tool to guide their candidates' planning skills, focusing on constructing the big ideas of science teaching. Kunzman (2002) found that teacher preparation helped teacher candidates develop their planning capacities and design their instruction in accordance with their visions of good teaching. Examining preparation for the professions, Grossman et al. (2009) found that teacher candidates had several opportunities to enact practices (e.g., lesson and unit planning), but they had fewer opportunities than novices in other professions.

Practice and rehearse teacher role(s). Several scholars have argued that, to be more centered in practice, courses must provide candidates with opportunities to *practice and rehearse* teaching, not just read about teaching (Ball & Forzani, 2009; Grossman et al., 2009; Kennedy, 1999). Potential practices include responding to students' mathematical ideas (Lampert et al., 2013), engaging students in investigations (Janssen, Westbroek & Doyle, 2014; Kloser, 2014), reading aloud (Reid, 20011), or modeling historical thinking (Fogo, 2014). These opportunities have been identified as those most often neglected in teacher education, so we wondered whether the programs we examined provided such opportunities.

Analyze pupils' learning. Some of the work on grounding in practice has focused upon providing opportunities for new teachers to look closely at and *analyze pupils' work* for trends or patterns (Ball & Cohen, 1999; Boyd et al., 2009; Windschitl et al., 2012). Ball and Cohen (1999) noted that "samples of student work could be used to inquire into what students have learned, and whether it was what the teacher intended" (p. 14). Hiebert et al. (2007) put analysis of pupils' learning at the core in learning how to teach, arguing that knowledge about pupils' learning could inform the teacher candidates about the effects of their instructional practices.

Include teaching materials, artifacts, and resources. Scholars in teacher education have argued that teachers need opportunities to study tasks and *teaching materials* relevant for prospective classroom teaching and learning (e.g., lesson plans, learning materials, assignments, or textbooks). Examining these materials and "records of practice" can make

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teaching practice "studyable" and can help new teachers see different versions of teaching and learning (Ghousseini & Sleep, 2011).

Talk about field placement/student teaching experiences. Providing opportunities to *talk about field placement* and connect theories of teaching and learning with real classroom experience is a decisive means of linking coursework and practice. However, teacher candidates must have structure and support when reflecting on their field placement experiences (Darling-Hammond, Holtzman, Gatlin, & Heilig, 2005). The focus on research-based teacher education in Finland (Niemi, 2016), as well as in Norway and Ireland (Conway & Munthe, 2015), has emphasized that teacher candidates should develop an inquiry stance toward their own teaching and make autonomous, professional choices based upon informed reflection. Similarly, reflection on practice has been highlighted in the United States (Valli, 1997) and the Netherlands (Tigchelaar & Korthagen, 2004).

Take pupils' perspective. In New Zealand, teacher educators have described opportunities for candidates to play the role of pupils within a problem-solving approach to teaching mathematics (Bailey & Taylor, 2015). Bailey and Taylor (2015) argued that this experience helped the candidates envision how this "ambitious teaching" (p. 121) could be enacted in the future.

See models of teaching. Further, scholars in different international settings argue have argued that teacher educators should *model* practice to allow teacher candidates to witness and understand complex and ambitious teaching practices (Bailey & Taylor, 2015; Kvalbein, 2003; McDonald et al., 2014). McDonald et al. (2014) underscored the importance of teacher educators modeling specific teaching practices, before the teacher candidates try them out in what they called "mediated field placements" (p. 501). In the Nordic countries, modeling is also evident in the seminar tradition in which teacher candidates are expected to prepare to become teachers by doing the same tasks and assignments as their prospective pupils will do (Kvalbein, 2003).

See connection to national or state curriculum. In the Nordic countries, national curricula represent a long tradition of linking abstract principles with real classroom teaching (Carlgren & Klette, 2008; Niemi, 2016). The New York City Pathways study identified the more influential opportunities grounded in practice as chances to examine state standards or disciplinary standards (such as the NCTM standards) as well as local curriculum (Boyd et al., 2009).

Table 1 summarizes these eight key indicators, in dimensions which we used when analyzing how the programs provided opportunities grounded in practice.

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Table 1

Opportunities Grounded in Practice in Teacher Education

Opportunities to…	Description of dimension
1. plan for teaching and teacher role(s)	The extent to which candidates have opportunities in the class to plan lessons or units, to develop instructional materials and resources, etc.
2. practice or rehearse teacher role(s)	The extent to which candidates have opportunities in the class period to practice, rehearse, or approximate elements of practice (e.g., practice leading a whole class or small group discussion).
3. analyze pupils' learning	The extent to which candidates have opportunities to analyze pupils' learning (e.g., to analyze K-12 pupil work, to view classroom transcripts or videos and analyze pupils' learning).
4. include teaching materials, artifacts, and resources	The extent to which candidates have opportunities to use, discuss, or analyze artifacts or resources from real classrooms and teaching (e.g., video of teachers or samples of real K-12 pupil work).
5. talk about field placement/student teaching experiences	The extent to which candidates have opportunities to discuss or relate what they are discussing or doing in class to their own fieldwork or student-teaching (e.g., bring in their own pupils' work).
6. take pupils' perspective	The extent to which candidates have opportunities to do work that their pupils will or might do (e.g., candidates read texts their pupils will read).
7. see models of teaching	The extent to which candidates have opportunities to see their teacher educators explicitly modeling the kinds of practices discussed in class (e.g., instructors model groupwork or giving good feedback).
8. see connection to national or state curriculum	The extent to which candidates have opportunities to read, review, critique, or analyze materials or resources specific to the national, state, or local context (e.g., to analyze national, state, or local curriculum etc.

Methods and Analysis

Design and Sampling

We designed this exploratory study as a multiple-case study, sampling cases we believed would provide information about the phenomenon under investigation (i.e., how coursework is grounded in practice) alongside sufficient diversity and opportunity to learn about complexity concerning this phenomenon across contexts (Stake, 2006, p. 23). As such, we were interested in the phenomenon of coursework grounded in practice, rather than the individual programs themselves. We thus examined the opportunities to enact practice through observation data from methods courses across six purposefully selected teacher

education programs across three national contexts. Purposive sampling is often preferable for multiple-case studies, rather than sampling the most typical cases (Stake, 2006).

Programs 1a and 1b were situated in Finland, programs 2a and 2b in Norway, and programs 3a and 3b in California in the United States. We chose national contexts that offered were chosen to bring sufficient variation in ways of grounding teacher preparation in practice, while being similar enough for comparison. All programs represented contexts that have worked on redesigning teacher education by strengthening the link to practice. Program 3a has systematically redesigned their program over the last decade to integrate campus courses with field placement (Hammerness, 2006). Program 3b has engaged in substantial reform efforts since 2001 (Sloan, 2015). Finland redesigned their teacher education in 1979, and the country has been highly recognized for its longstanding investment in teacher preparation including teacher training at the master's level in all subject areas and grade levels (Sahlberg, 2011; Tirri, 2014). Another feature that made Finnish programs relevant was the longstanding tradition of teacher training schools with shared faculty (Uusiautti & Määtä, 2013). Norway has been in the midst of reform nationwide the last years, investing substantial resources and efforts to improve teacher education (Munthe & Rogne, 2016; Norwegian Agency for Quality Assurance in Education, 2006). Beginning in 2019, all Norwegian K–12 teachers must hold a master's degree (Norwegian Government, 2014). Program 2a was engaged in a major redesign shortly before our data collection, emphasizing ways of strengthening the links between coursework and field placement (Engelien, Eriksen, & Jakhelln, 2015). Program 2b has employed a cooperative partnership model with their placement schools since 1998 (Haugaløkken & Ramberg, 2007), including experimenting with concurrent versus interval-based practice periods (Wæge & Haugaløkken, 2013). Further, the programs were all (a) university-based teacher education programs that (b) prepared teachers at the secondary level (grades 8–13), (c) were situated in urban areas, and (d) were seen as rather selective. They all also (e) combined coursework with field placement in schools, but to varying degrees of established collaboration and with variations in the organization of field placement.

The Californian programs and program 2a in Norway were one-year programs candidates attended after obtaining a bachelor's or master's degree. The Finnish programs and program 2b in Norway featured a flexible design, allowing candidates to participate in a five-year program or a one-year program. Also, the acceptance rates were fairly low at all programs, except for program 3b. There were nevertheless important differences between the programs, some of which are summarized in Table 2.

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Table 2

Characteristics of the Sampled Programs

Program	Country/ state	Organization of fieldwork		Amount of fieldwork in hours	Acceptance rates in %	No. of candidates
		Intervals	Concurrent			
1a	Finland	x		540	10–40[a]	410
1b		x		432	89[b]	40
2a	Norway	x		480	20.5	160
2b		x		520	44	220
3a	California, US		x	780	-[c]	72
3b			x	1000	67	29

Note.[a]Depending on subject. [b]The acceptance rate seems high because the Finnish education system has three types of teachers: subject teachers, class teachers, and special education teachers. Our sample is from subject teacher programs, which have higher acceptance rates than with the other teacher education programs because these teacher candidates have already gone through one university acceptance process when initiating their major studies. In 2012, the acceptance rates at program 1b were considerably lower for candidates applying for the class teacher program (22%) and for the special education teacher program (13%). [c]This data was not obtained from program 3a.

The programs' sizes varied considerably: the Finnish programs had 40 (program 1b) and 410 candidates (1a), and the Norwegian programs were considered relatively large, with 160 (2a) and 220 candidates (2b), while the Californian programs were both considered small with 29 (3b) and 72 candidates (3a). The Nordic programs were all at public institutions, providing free tertiary education for all candidates. Program 3b was at a public university, while 3a was at a private university; however, both sites required tuition fees but also had a longstanding tradition of supporting teacher candidates with generous scholarships. The organization and amount of field placement varied. The Californian programs had more field placement than the Nordic programs, and it was organized concurrently (see Table 2). Despite these differences, all the programs offered a similar program designs, including the composition of courses, the ratio of subject-specific methods courses and foundation courses, and the idea of progression (cf. Hammerness & Klette, 2015). Together, these six programs constituted a sample of assumingly strong programs with certain similarities but with enough variety and contextual differences to make cross-case analysis interesting.[13]

We selected the courses that were most likely to illustrate how coursework was grounded in practice. We thus decided to collect data in the methods courses, in particular language arts and mathematics methods courses, because those subjects are priorities for quality teaching in

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13 The study is part of the larger Coherence and Assignments in Teacher Education (CATE) study. The CATE study also includes programs from Chile and Cuba (and for the survey data also Malaysia and Estonia). Due to language challenges (the translation of observation data from Spanish to English) these two programs are not included in the current analyses.

most countries (Organisation for Economic Co-operation and Development [OECD], 2014).
More information about the courses can be found in Table 3.

Table 3

Characteristics of the Sampled Courses

Program	Status of course	Duration of course	# lessons per week	Duration of each lesson	Hours of observation	# teacher candidates (LA/M)
1a	1 of 2 subject didactical courses over 5 years	1 semester (1/2) year	2–3	90 mins	24	20/-
1b	1 of 3 subject didactical courses over 5 years	1 semester (1/2) year	1	Approx. 150 mins	14	4/6
2a	The only subject didactical course	1 year	1	90 mins	10.5	23/16
2b	The only subject didactical course	1 year	1	90 mins	9	39/35
3a	1 of 3 C&I courses	1 term (approx. 3 months)	1	150 mins	17.5	17/15
3b	2 of 3 methods courses in each subject	One course lasted 1 year, the other 1 semester (1/2 year)	1 each course	Approx. 150 mins	29	5/4

In all programs, the candidates took one methods course across the year of teacher
preparation (year 3 or 4 in the Finnish programs), but some programs divided these courses
into two or more modules. The duration of the courses varied, but courses typically took
place once a week. The exception was program 1a, which had a more flexible schedule. The
lessons lasted about 90 minutes in the Nordic programs, except program 1b, which had
lessons of about 150 minutes like the Californian programs. These differences resulted in the
variance of hours observed across the programs. The number of candidates enrolled in these
courses varied, as displayed in Table 3.

Data Sources

Observations occurred over a three-week period at each site, consisting of approximately eight hours of teaching in each course at each program, resulting in 104 hours of observation. During the observations, we found that different teacher educators might teach the classes, while other programs maintained the same teacher educator across all three weeks. We recognize that three weeks represents a limited period of the time in which teacher candidates have opportunities to make connections to practice in their methods courses; however, observational studies from K–12 classrooms have suggested that four consecutive lessons per classroom provide sufficient information to get a first overview of teaching quality (Ball & Hill, 2009; Klette, 2009). Based on this information, we estimated that approximately three weeks of teaching in a teacher education classroom would be sufficient. Altogether, this study covered 18 weeks of observation, offering valuable insight into the teaching practices of these teacher education programs overall.

Data Gathering

The first author was responsible for collecting data at two sites, while four trained research assistants collected data at the other sites (see Hammerness & Klette, 2015, for an overview of the data collection). The authors systematically trained all assistants to take field notes and to capture as much detail as possible, including spoken dialogue and exact quotations. The observations were typed as real-time field notes. On average, we had 10–15 pages of observation notes for each class. To support our analysis, our observation data also included a collection of artifacts such as typed or handwritten assignments, PowerPoint slides, and teacher candidates' work in class. The written notes together with the supportive artifacts constituted the data for our analysis.

Analysis: Coding and Scoring

To analyze the observation data, we engaged in two steps of analysis as depicted in Figure 1:
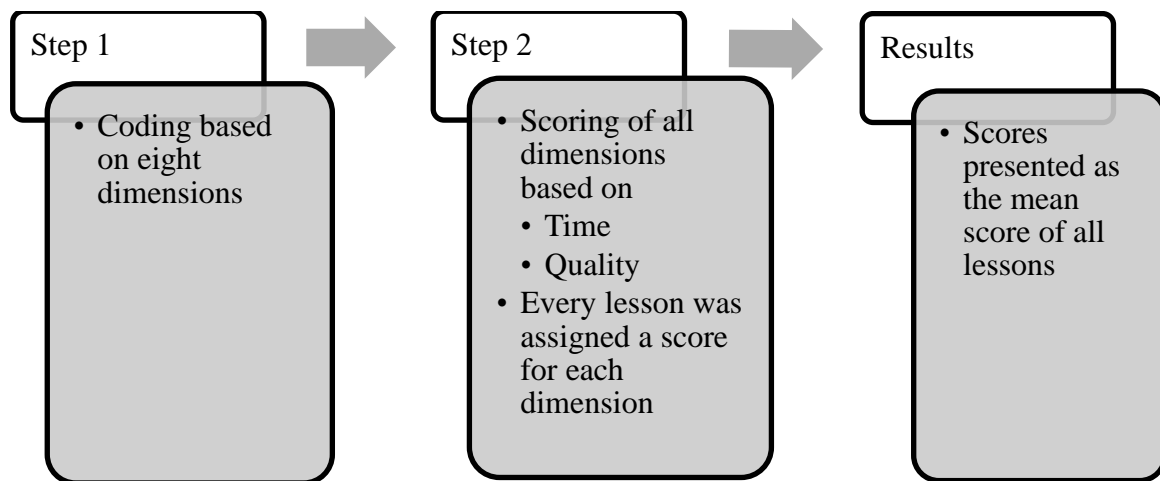
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Figure 3. Drawing of the process of analysis.

First, we coded the teacher candidates' opportunities to enact practice as outlined in our analytical framework using the software HyperResearch 3.5.2. For instance, when a teacher educator explicitly said he or she would illustrate a teaching strategy for teaching literature, we coded this as "models of teaching" (dimension 7).

In this first step of analysis, we noticed that these experiences varied not only in terms of *type* of opportunity but also their *extensiveness* (in terms of quality of and time spent on task). For instance, sometimes candidates would mention their field experiences only briefly, and then the instructors would move on. At other times, teacher candidates might be asked to discuss their field experience and connect it to theory or the topic of the class that day in a more specific and detailed way. To capture these aspects of the opportunity, we developed a means of scoring that captured both the quantitative elements (frequency and duration) and qualitative aspects such as depth and level of concreteness. As a second step of data analysis, drawing on similar protocols for scoring observation data (CLASS; Pianta & Hamre, 2009; PLATO; Protocol for Language Arts Teaching Observations [PLATO] 5.0.), we developed a coding book that operationalizes each of the dimensions on a 1–4 scale using utterances, interaction patterns, and specific, observable behaviors. All scores for all dimensions in our protocol measure *time spent* on a connection to practice, ranging from very seldom and brief (1) to more frequent or with a duration constituting a main portion of the lesson (4). Time estimates are based upon 10-minute timestamps the research assistants made in the field notes. The protocol also measures the *quality* of the opportunity to enact practice, referring to how general or vague (1) these opportunities were, as opposed to specific and in depth (4). For example, a score of 4 in dimension 1 would indicate that the candidates spent a substantial amount of time during the lesson to plan a unit in detail, perhaps specifically related to

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different types of pupils or their own pupils in schools, connected to aspects of planning derived from theory or from reading, discussed with others, and/or analyzed.[14]

Contrary to studies using intervals of 10 or 15 minutes for a score (cf. PLATO and CLASS referred to above), we assigned every lesson a score for each dimension. We made this choice because of the current scarcity of research regarding teaching practices in teacher education, and based upon a hypothesis that teaching in teacher education classrooms may be less repetitive than in K–12 classrooms. Scores reported in this paper were the average of the scores of all lessons we observed during the three weeks in each teacher education program (see Figure 1). We double-coded 8.7% of our data to calibrate the scoring. The strength of agreement was good with Kappa = 0.66 (Fleiss, Levin, & Paik, 2003).[15] After inter-rater reliability was established, the first author coded all lessons and picked excerpts from the data to illustrate the characteristics of a higher score of the dimensions.

Our observations represented a portion of the entire teacher education program. Teacher candidates might have had opportunities, for instance, to analyze pupils' work or to experience modeling in other courses in the programs that we did not observe, due to the timing of our observations. Similarly, these programs have structural differences, as mentioned in the program descriptions above, that could affect opportunities to connect to practice. Nevertheless, we argue that examining the nature of opportunities that might occur during the coursework is useful and important.

Findings

From our analysis of the observation field notes across all six programs, we found that teacher candidates had extensive opportunities to enact practice by the *inclusion of teaching materials, artifacts, and resources* (dimension 4 [D4]) and by *taking the pupils' perspective* (D6). They had some opportunities to *talk about field placement* (D5), *plan for teaching and teacher role(s)* (D1), and *see the connection to national or state curriculum* (D8). The teacher candidates had few opportunities to *practice or rehearse teacher role(s)* (D2), *analyze pupils' learning* (D3), or *see models of teaching* (D7). Figure 2 summarizes these findings across programs.

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[14] For more information, the complete coding book is published here:
http://www.uv.uio.no/ils/english/research/projects/cate/Instruments/coding-scheme-cate-observation-data.pdf

[15] Because the unit of our score was the whole lesson, each individual dimension has received only about three scores in each subject. Since the Kappa increases with increasing number of codes (Bakeman & Quera, 2011), we do not report the Kappa of the individual dimensions.
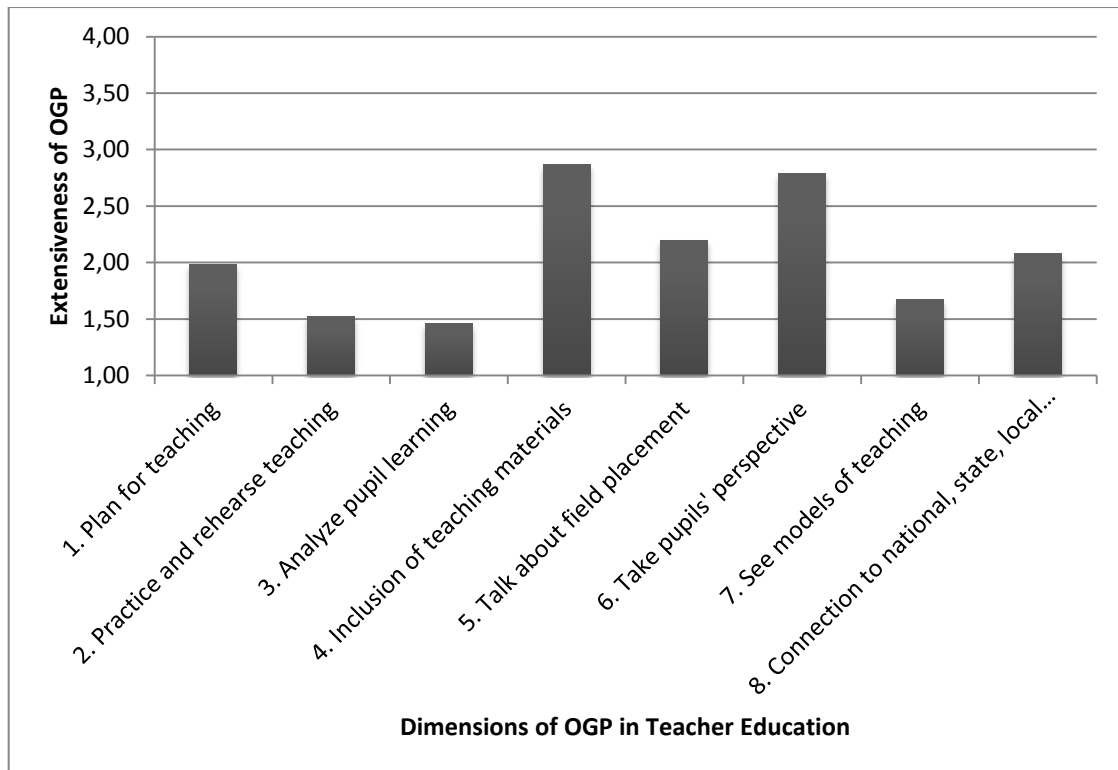
Figure 4. The extensiveness of opportunities grounded in practice (OGP) across all programs, expressed as the mean of scores across all observations. The extensiveness is expressed on the left vertical line by a measure from 1 (none) to 4 (extensive). The dimensions of opportunities grounded in practice are displayed on the horizontal line.

While our analysis revealed clear similarities and patterns across programs, we also found substantial differences in the extensiveness and quality of how lessons and programs provided opportunities to ground coursework in practice (see Table 4).

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Table 4

Mean Scores for Individual Dimensions Displayed per Program and per Subject

Programs and subjects		Dimensions							
		1	2	3	4	5	6	7	8
1a	LA	1.4	1.5	1.3	2.4	1.9	2.7	1.3	2.1
	M	2	1.4	1	2.9	1	2.7	1.4	1.4
1b	LA	1	1.8	2.3	4	3.3	2.5	1.8	2
	M	1	1.5	1	1.5	1.5	1.8	1.5	1
2a	LA	2	2.5	1	2.5	2.5	2.5	3	4
	M	2	1	2	2.3	1	3	1	2
2b	LA	1.7	1	1.7	3	1.7	1.7	1.7	2.3
	M	3.5	2	1	3	1.5	3	2	3
3a	LA	3. 7	1	1	3	3.3	2.3	1.7	2
	M	4	1	1.7	3.7	3.7	4	2	1.3
3b	LA	2.3	1.3	1.7	2.7	3	3	2.8	1.8
	M	1.5	2.3	2	3.7	2.8	4	1.2	3.3

Note. LA = methods courses of Language Arts; M = methods courses of Mathematics. The scores are given as a mean of the scores of all observations.

As the aim of this article was to illustrate what instructional practices grounded in practice might look like, we first share examples of these practices. Because we were interested in the potential of what these opportunities might convey, we have chosen excerpts and illustrations with strong presence of the dimensions (see Table 4).

The candidates had few opportunities to *practice or rehearse teacher role(s)* (D2) and to *see models of teaching* (D7) across all programs. However, the candidates in program 2a had quite extensive opportunities to do so in the language arts methods course (see Table 4). The following excerpt from program 2a was taken from a lesson where the teacher candidates had the opportunity to both practice and rehearse teacher role(s) and see models of teaching. The topic of the lesson was whole-class literature discussions, and the teacher educator explicitly said he would first model one such discussion. He posed questions to the candidates derived from research on this specific teaching method; in addition, a PowerPoint presentation displayed different types of questions for use in this specific kind of whole-class discussions: "questions of identification, questions for reflection, and questions of transfer."[16] After he had modeled the teaching activity, he asked the teacher candidates to role-play the same type of practice in groups:

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[16] Referring to Skarðhamar (2001).

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(1) Teacher Candidate (TC)2: Can you start reading, please?

(2) [TC1 reads out loud].

(3) TC2: Great, thanks! Have any of you ever been in love?

(4) TC1: [not detectable for the observer].

(5) TC2: Why do you think she feels that way when the boy enters the shop?

(6) [Conversation continues, similarly to the one just modeled by the teacher educator, with questions derived from the types of questions on the PowerPoint].

(7) Teacher Educator (TE) (in plenary): Let's stop for a minute. How did you as teachers experience this? How was it to use this method?

(8) TC7: I think it was really hard, since I did not know the text really well.

(9) TC2: I actually think that made it easier, because that made the pupils interpret even better than me.

(10) TC4: I realized I made the mistake that I was eager to assess the contributions the pupils had, give them feedback.

[Discussion continues].

This instance was scored as a 4 on the dimensions *practice and rehearse teacher role(s)* (D2) and *see models of teaching* (D7), as both the time spent on the activity and the quality of the opportunity were extensive. The teacher candidates spent 20 minutes observing the teacher educator modeling and discussing that experience afterwards, as well as 20 minutes rehearsing (lines 1–6) and discussing the rehearsal in the end (lines 7–10). They rehearsed a specific method of teaching literary discussions, with explicit examples of types of questions that could be used, derived from their readings (lines 3, 5, 6).

The candidates also had few opportunities to *analyze pupils' learning* (D3). In the rare cases that we did see analysis of pupils' learning, candidates often did not spend sufficient time on the analysis to be able to detect the learning that the pupil had demonstrated. Still, we found some instances of more thorough opportunities to analyze pupils' learning; for instance, candidates had opportunities to compare their assessments of exemplars of Norwegian pupils' national exams in mathematics, or to analyze pupils' written texts in Finnish according to a specific framework (Jenset, Canrinus, Hammerness, & Klette, 2016).

As already shown, the teacher candidates had extensive opportunities to *include teaching materials, artifacts, and resources* (D4) and *take pupils' perspective* (D6). One excerpt from a mathematics methods course in program 1a illustrates what that might look like. The

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candidates were working in groups with tasks their pupils might do. They were asked to look for central issues the pupils should notice in the tasks, and what concepts the pupils would need to know to be able to complete the tasks. In the following excerpt, they discussed the task "Divide a square into two equal parts":

(1) TC: One needs to know what is meant by isomorphic.

(2) [One candidate nods].

(3) TC: And probably you need to know what is a square as well.

(4) TC: But doesn't this imply that this square must be isomorphic to the original one?

(5) TC: Well squares are always isomorphic so if you divide it.

(6) TC: Then you have two options, either two triangles or two rectangles.

(7) (…) [Candidate writes on a paper].

(8) TC: I think we are thinking about this in a too complicated way because the point was not to define this in mathematically correct way. If you are teaching this to 11-year-old Pete, it is pointless to define it to him like this.

[Discussion continues].

The teacher candidates had the opportunity to work with the task for an extensive amount of time, about half the lesson, and they worked with and discussed the teaching material in depth. They connected their discussion to principles of the teaching of mathematics while discussing specific mathematical concepts the pupils might need to know to solve the task (line 8). The excerpt therefore illustrates a score 4 on the opportunity to include teaching materials. It received a similarly high score on the opportunity to take the pupils' perspective, as candidates spent an extensive amount of time doing the tasks that their pupils might do, such as drawing on paper (line 7) and doing the mathematics of the task in depth.

The opportunity to *talk about field placement* (D5) varied across the programs. During our observation period, the Californian programs tended to provide more extensive opportunities to talk about field placement than the Nordic programs (see Table 4). Many of the instances of talk about field placement that we found were superficial and simplified, but at program 3a in California there were also instances of more complex and specific talk, connecting the candidates' practical experiences to theoretical concepts (Jenset, Hammerness, & Klette, 2016).

Similarly, opportunities to *plan for teaching and teacher role(s)* (D1) and to *connect to national or state curriculum* (D8) varied across lessons or programs. The candidates at

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program 3a had the most extensive opportunities to plan for teaching during our observations (see Table 4). They often formed workshops (smaller groups of four to five teacher candidates and one teacher educator) at the end of their lessons. Here, they would get feedback on the unit planning for their teaching in schools. In the following excerpt from a language arts methods course, one teacher candidate received feedback on a planned unit:

(1) TE: So how long is your unit?

(2) TC5: I'm thinking about 2 weeks.

(3) TE: So, in the Common Core, there's no reading strategy?

(4) TC3: I think it's just reading – there's no literary.

(5) TC10: So, it's not based on Common Core. Just being familiar with 19th-century texts, or whatever.

[All return to reading for about 2 more minutes].

(6) TE: Comments about the essential questions?

(7) TC3: I think they tie together very well and make sense for the reading.

(8) TC10: Simple and intriguing. You can't have a single-word answer.

(…)

(9) TE: OK, what were your targets?

(10) TC3: I like them generally, but I don't see how they relate to your essential question. Is that a thing?

(11) TE: Conceptually yes, but we'll see that in the wording. That might work, but only if we're inside TC5's head. So, we'll need to make that clear.

[Discussion continues].

The candidates spent a great portion of the lesson receiving or giving feedback on unit plans. The feedback was specifically targeted to the individual plan (lines 7, 8, 10, 11), and the teacher educator made sure the comments were related to principles of planning as emphasized in the curricula of the methods course (lines 6, 9). The excerpt is thus an example of a score 4 of planning. The excerpt also illustrates opportunity to connect to state curriculum (lines 3, 4, 5), even though it was only briefly mentioned, as was often the case in our data.

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Discussion

Patterns in Approaches to Grounding Coursework in Practice

Using an analytical framework operationalizing the conception of 'grounding in practice', our findings revealed substantial differences in the extensiveness of such opportunities. Across programs, teacher candidates had the fewest opportunities to *practice or rehearse teacher role(s)*, *see models of teaching*, and *analyze pupils' learning.* These findings not only corroborate earlier findings, but they serve to underscore the continued need to provide teacher candidates with opportunities to enact, simulate, and rehearse practice (Darling-Hammond, 2006; Grossman et al., 2009; Hiebert et al., 2007). The relatively few opportunities across programs to witness modeling reflects the longstanding separation between practice and coursework on campus (Kennedy, 2008; Zeichner, 2010). It is interesting to note, however, that we found the most instances of rehearsals and modeling in program 2a, which had just been redesigned to focus upon ways that campus coursework might provide opportunities to test out, rehearse, and model relevant classroom practices. We should be clear that, for something to be coded as *see models of teaching,* the teacher educator had to *explicitly* model, as the example from program 2a shows. Therefore, there might have been instances in our data where the teacher educator intended to model, but where it was not explicitly expressed as such to the teacher candidates or to us as observers.

Conversely, we found that the teacher candidates across the programs had extensive opportunities to *take pupils' perspective* and to *include teaching materials, artifacts, and resources* in their activities. This finding confirmed our expectations based on what we know about the teaching tradition in the Nordic countries (Kvalbein, 2003; Rasmussen, 2008). Scholars have emphasized the importance of incorporating materials and artifacts of real classroom practice in the coursework on campus to help teacher candidates more deeply immerse themselves in the complexity of real practice (Ball & Cohen, 1999; Forzani, 2014). Nevertheless, such artifacts need to be thoughtfully selected, and their use by teacher candidates carefully scaffolded (Ghousseini & Sleep, 2011). Next steps for our work might include a more deep examination of how these artifacts are identified and woven into learning experiences for candidates.

Despite some differences across the programs, we found similar patterns of extensiveness of opportunities to enact practice across these programs. Our findings reveal that some dimensions of practice may be part of the current instructional practices of teacher education (e.g., asking candidates to take the pupils' perspective or examine teaching materials), while

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other means of grounding in practice (e.g., examining student work) may require more specific attention. The multiple-case design, looking across different contextual and institutional solutions (e.g., size of the program, organization of practice, redesign efforts), adds strength to this argument. A key question these findings raise across all programs is the question of whether teacher education has overemphasized the role of teaching at the expense of an explicit focus on pupils' learning. While teacher candidates have always learned *about* learning theories in teacher education, the actual learning of the pupils—and how the teacher candidates can analyze, interpret, and diagnose individual pupils' learning—may not be emphasized enough. Pupils learning should be the core of teachers' professional repertoire (Hiebert et. al., 2007); in turn, providing candidates with competences and tools to interpret and decipher pupils' learning should be a key aspect of their training.

Differences across Contexts

Even though we found this pattern of extensiveness across programs on these distinct dimensions of practice, other dimensions (e.g., opportunities to *plan for teaching and teacher role(s)*, to *see connection to national or local curriculum*, and to *talk about field placement/student teaching experience*) varied considerably across the programs. Some teacher candidates in our study had almost no opportunities to plan for teaching during our three weeks of observation, while the candidate in program 3a spent much time planning. This could be due to the fact that one of the main assignments at program 3a was to conduct a unit plan, and planning was also essential in the Performance Assessment for California Teachers (PACT). Considering the long tradition in the Nordic countries for using *national curriculum* as a steering document (Carlgren & Klette, 2008), one might have expected a greater difference between the Nordic and the Californian programs in terms of opportunities to connect to national or state curriculum. However, the introduction of the Common Core in the state of California at the time of our observations might explain why the differences were relatively small (California Department of Education, 2014).It is difficult to say if these variations are due to contextual differences such as national setting or program structure. From Table 4, it seems like these opportunities vary within and across national contexts.

However, we also found that the extent to which the teacher candidates had opportunities to *talk about field placement* varied considerably across the programs. Interestingly, the Californian programs, which scored higher on this dimension, had more hours of fieldwork and concurrent practice, whereas the Nordic programs all had fewer hours of field placement and organized their field placements in intervals. Field placement is critical to teacher

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candidates' learning, but we do not have many studies comparing variations in *how* the field placement is organized and its implications for prospective teachers. Brouwer and Korthagen (2005) suggested that alternating field placement and periods of coursework may be more supportive of the development of candidates' teaching competence. Nevertheless, they did not make claims about what kind of alteration would be best. Additionally, we do not know whether discussion about field placement enables candidates to connect theory and practice. Our data indicated that there is substantial variation in the quality of the talk about field placement and its role in connecting theory and practice, and we need to examine the nature of this discourse in more depth. Other factors (e.g., smaller program size or timing of the observation period) may have affected our findings on this dimension. The smaller Californian programs might allow the teacher educators to have greater knowledge about the schools and the candidates' experiences. Likewise, our observations may not have coincided with the field placement periods, which could have resulted in less discussion about these experiences.

Aspects of Grounding in Practice: Some More Established and Others Still Emerging?

Our examination illustrates some of the approaches to grounding in practice one might seek to examine programs' efforts in these areas (e.g., our eight dimensions), but also illustrate patterns around aspects that are potentially more established as well as emerging. While we see some approaches to grounding in practice that appear to be more frequent (e.g., use of teaching materials, taking the pupils' perspective), we also identified some arenas in which grounding in practice occurred more seldom (e.g., analyze pupils' learning, rehearse teaching). Indeed, our findings may indicate that efforts to ground in practice reflect a focus upon teaching that has not yet fully expanded to pupils' learning. Despite differences in program size and organization of field placement, the dimension *analyze pupils' learning* had the lowest score across all programs. Our multiple-case design, selecting programs across different national contexts, helps strengthen our examination. However, due to this study's exploratory character, we see this as a starting point for discussion regarding the many approaches campus courses are taking to be grounded in practice.

Further, we believe that the programs in our sample, due to their own efforts to address practice, may provide a solid ground for learning given their active engagement in this challenge. This study has not considered the fieldwork site of teacher education or outcome measures related to the instructional practices highlighted. This would be an important next

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step to answer questions about the impact that these opportunities to connect to practice in teacher education could have on the quality of teaching (Boyd et al., 2009). Still, we hope that the features we looked for and the illustrative excerpts in this article can be useful to other teacher education programs. Our approach to operationalizing the concept of grounding in practice may help encourage fruitful conversations among faculty in terms of evaluating their own potential areas of focus within their program. Given the growing understanding of the importance of providing opportunities that are grounded in practice, this work may be helpful to other programs seeking to better meet the challenge of linking to practice through coursework.

Our findings reveal that current efforts to connect to practice are present in these courses, and help illustrate the variety of approaches programs have taken to address some of the longstanding challenges of teacher education. If we continue to support these efforts to ground preparation more deeply in practice, as well as identify even more opportunities to deepen and extend that work, we may be better able to prepare teachers with the kind of practical experience that in turn, will be most likely to support meaningful pupil learning.

References

Bailey, J., & Taylor, M. (2015). Experiencing a mathematical problem-solving teaching approach: Opportunities to identify ambitious teaching practices. *Mathematics Teacher Education and Development, 17*(2), 111–124. Retrieved from http://files.eric.ed.gov/fulltext/EJ1085902.pdf

Bakeman, R., & Quera, V. (2011). *Sequential analysis and observational methods for the behavioral sciences*. New York, NY: Cambridge University Press.

Ball, D. L., & Cohen, D. K. (1999). Developing practice, developing practitioners: Toward a practice-based theory of professional education. In G. Sykes & L. Darling-Hammond (Eds.), *Teaching as the learning profession: Handbook of policy and practice* (pp. 3–32). San Francisco, CA: Jossey Bass.

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

Ball, D. L., & Hill, H. C. (2009). Measuring teacher quality in practice. In D. H. Gitomer (Ed.), *Measurement issues and assessment for teaching quality* (pp. 80–98). Thousand Oaks, CA: Sage Publications.

Boggess, L. (2008). *Home growing teacher quality: District partnerships with urban teacher residencies* (Unpublished doctoral dissertation). Educational Theory and Policy, Pennsylvania State University, Philadelphia.

Boggess, L. (2010). Tailoring new urban teachers for character and activism. *American Educational Research Journal, 47*, 65–95. Retrieved from http://www.jstor.org/stable/40645419

Boyd, D. J., Grossman, P. L., Lankford, H., Loeb, S., & Wyckoff, J. (2009). Teacher preparation and student achievement. *Educational Evaluation and Policy Analysis, 31*(4), 416–440. doi:10.3102/0162373709353129

British Educational Research Association (2014). *The role of research in teacher education: Reviewing the evidence.* Retrieved from http://www.bera.ac.uk/wp-content/uploads/2014/02/BERA-RSA-Interim-Report.pdf

Britzman, D. (2003). *Practice makes practice: A critical study of learning to teach*. Albany: State University of New York Press.

143

Brouwer, N., & Korthagen, F. (2005). Can teacher education make a difference? *American Educational Research Journal, 42*(1), 153–224. doi:10.3102/00028312042001153

California Department of Education. (2014). *Common Core State Standards systems implementation plan for California*. Retrieved from http://www.cde.ca.gov/re/cc/documents/ccsssimplementationplan.pdf.

Carlgren, I., & Klette, K. (2008). Reconstructions of Nordic Teachers: Reform policies and teachers' work during the 1990s. *Scandinavian Journal of Educational Research, 52*(2), 117-133. doi:10.1080/00313830801915754

Cochran-Smith, M., Villegas, A. M., Abrams, L. W., Chávez-Moreno, L. C., Mills, T., & Stern, R. (2016). Research on teacher preparation: Charting the landscape of a sprawling field. In D. H. Gitomer & C. A. Bell (Eds.), *Handbook of research on teaching* (5th ed., pp. 439–547). Washington, DC: American Educational Research Association.

Conway, P. F., & Munthe, E. (2015). The practice turn. Research-informed clinical teacher education in two countries. In J.-K. Smedby & M. Stutphen (Eds.), *From vocational to professional education. Educating for social welfare* (pp. 146–163). London, England: Routledge.

Darling-Hammond, L. (2006). *Powerful teacher education: Lessons from exemplary programs*. San Francisco, CA: Jossey-Bass.

Darling-Hammond, L., Burns, D., Campbell, C., Goodwin, L., Hammerness, K., Low, E. L., . . . Zeichner, K. M. (2017). *Empowered Educators: How high performing systems shape teaching quality around the world.* . San Francisco, CA: Jossey-Bass.

Darling-Hammond, L., Chung, R., & Frelow, F. (2002). Variation in teacher preparation: How well do different pathways prepare teachers to teach? *Journal of Teacher Education, 53*(4), 286–302. doi:10.1177/0022487102053004002

Darling-Hammond, L., Holtzman, D., Gatlin, S. J., & Heilig, J. V. (2005). Does teacher preparation matter? Evidence about teacher certification, Teach for America, and teacher effectiveness. *Education Policy Analysis Archives, 13*(42), 1–51. doi:10.14507/epaa.v13n42.2005

Donaldson, G. (2011). *Teaching Scotland's future. Report of a review of teacher education in Scotland.* Edinburgh, Scotland: The Scottish Government.

Edwards-Groves, C. J., & Hoare, R. L. (2012). "Talking to learn": Focusing teacher education on "dialogue" as a core practice for teaching and learning. *Australian*

Journal of Teacher Education, 37(8), 82–100. Retrieved from http://ro.ecu.edu.au/cgi /viewcontent.cgi?article=1902&context=ajte

Engelien, K., Eriksen, T., & Jakhelln, R. (2015). Integrerte studiedesign for femårig lærerutdanning [Integrated study design for five-year teacher education]. In U. Rindal, A. Lund, & R. Jakhelln (Eds.), *Veier til fremragende lærerutdanning* [Roads towards excellent teacher education] (pp. 157–169). Oslo, Norway: Universitetsforlaget.

Feiman-Nemser, S., Tamir, E., & Hammerness, K. (Eds.). (2014). *Inspiring teaching. Preparing teachers to succeed in mission-driven schools*. Cambridge: Harvard Ed Press.

Fleiss, J. L., Levin, B., & Paik, M. C. (2003). *Statistical methods for rates and proportions*. Hoboken, NJ: Wiley.

Fogo, B. (2014). Core Practices for Teaching History: The Results of a Delphi Panel Survey. *Theory & Research in Social Education, 42*(2), 151-196. doi:10.1080/00933104.2014.902781

Forzani, F. M. (2014). Understanding "core practices" and "practice-based" teacher education: Learning from the past. *Journal of Teacher Education, 65*(4), 357–368. doi:10.1177 /0022487114533800

Ghousseini, H., & Sleep, L. (2011). Making practice studyable. *ZDM, 43*(1), 147–160. doi:10.1007/s11858-010-0280-7

Grossman, P., Compton, C., Igra, D., Ronfeldt, M., Shahan, E., & Williamson, P. (2009). Teaching practice: A cross-professional perspective. *Teachers College Record, 111*(9), 2055–2100. Retrieved from https://cset.stanford.edu/sites/default/files/files/documents /publications/Grossman-TeachingPracticeACross-ProfessionalPerspective.pdf

Grossman, P., Hammerness, K., & McDonald, M. A. (2009). Redefining teaching, re-imagining teacher education. *Teachers and teaching: Theory and practice, 15*(2), 273-290. doi:10.1080/13540600902875340

Grossman, P., Loeb, S., Cohen, J., & Wyckoff, J. (2013). Measure for measure: The relationship between measures of instructional practice in middle school English language arts and teachers' value-added scores. *American Journal of Education, 119*(3), 445–470. doi:10.1086/669901

Hammerness, K. (2006). From coherence in theory to coherence in practice. *Teachers College Record*, 1241-1265. Retrieved from

145

https://ed.stanford.edu/sites/default/files/from_coherence_in_theory_to_coherence_in _practice.pdf

Hammerness, K. (2012a). A comparative study of three key features in the design and practice of teacher education in the United States and Norway: Part I. Findings from a study in the United States [Visions 2011: Teacher education]. *Acta Didactica Norge, 6*(1). Retrieved from

https://www.journals.uio.no/index.php/adno/article/view/1087/966

Hammerness, K. (2012b). A comparative study of three key features in the design and practice of teacher education in the United States and Norway: Part II. Findings from a study in Norway [Visions 2011: Teacher Education]. *Acta Didactica Norge, 6*(1). Retrieved from https://www.journals.uio.no/index.php/adno/article/view/1088/967

Hammerness, K., & Klette, K. (2015). Indicators of quality in teacher education: Looking at features of teacher education from an international perspective. In A. W. Wiseman & G. K. LeTendre (Eds.), *Promoting and sustaining a quality teaching workforce* (Vol. 27, pp. 239 - 277): Emerald Group Publishing.

Hammerness, K., Williamson, P., & Kosnick, C. (2016). Introduction to the special issue on urban teacher residencies. *Urban Education, 51*(10), 1155-1169. doi:10.1177/0042085915618723

Haugaløkken, O. K., & Ramberg, P. (2007). Autonomy or control: Discussion of a central dilemma in developing a realistic teacher education in Norway. *Journal of Education for Teaching, 33*(1), 55–69. doi:10.1080/02607470601098310

Hiebert, J., Morris, A. K., Berk, D., & Jansen, A. (2007). Preparing teachers to learn from teaching. *Journal of Teacher Education, 58*(1), 47–61. doi:10.1177 /0022487106295726

Holmes Group (1995). *Tomorrow's schools of education*. East Lancing, MI: The Holmes group. Retrieved from http://files.eric.ed.gov/fulltext/ED399220.pdf

Ikpeze, C. H., Broikou, K. A., Hildenbrand, S., & Gladstone-Brown, W. (2012). PDS collaboration as third space: An analysis of the quality of learning experiences in a PDS partnership. *Studying Teacher Education*, *8*(3), 275–288. doi:10.1080/17425964 .2012.719125

Jakku-Sihvonen, R., & Niemi, H. (Eds.). (2006). *Research-based teacher education in Finland: Reflections by Finnish teacher educators* (Vol. 25). Turku, Finland: Suomen Kasvatustieteellinen Seura.

Janssen, F., Westbroek, H., & Doyle, W. (2014). The practical turn in teacher education: Designing a preparation sequence for core practice frames. *Journal of Teacher Education, 65*(3), 195–206. doi:10.1177/0022487113518584

Jenset, I. S., Canrinus, E. T., Hammerness, K., & Klette, K. (2016). Making learning visible in teacher education: Opportunities to analyze pupils' learning within coursework at campus. Manuscript submitted for publication.

Jenset, I. S., Hammerness, K., & Klette, K. (2016). Linking practice to theory in teacher education: An examination of talk about field placement within coursework at campus. Manuscript submitted for publication.

Kazemi, E., & Franke, M. L. (2004). Teacher learning in mathematics: Using student work to promote collective inquiry. *Journal of Mathematics Teacher Education, 7*(3), 203–235. doi:10.1023/B:JMTE.0000033084.26326.19

Kennedy, M. (1999). The role of pre-service teacher education. In L. Darling-Hammond & G. Sykes (Eds.), *Teaching as the learning profession: Handbook of teaching and policy* (pp. 54–86). San Francisco, CA: Jossey Bass.

Kennedy, M. (2008). The place of teacher education in teachers' education. In M. Cochran-Smith, S. Feiman-Nemser, J. McIntyre, & K. E. Demers (Eds.), *Handbook of research on teacher education. Enduring Questions in Changing Contexts* (3rd ed., pp. 1199–1203). New York, NY: Routledge.

Klein, E. J., Taylor, M., Onore, C., Strom, K., & Abrams, L. (2013). Finding a third space in teacher education: Creating an urban teacher residency. *Teaching Education, 24*, 27–57. doi:10.1080/10476210.2012.711305

Klette, K. (2009). Challenges in strategies for complexity reduction in video studies. Experiences from the PISA+ study: A video study of teaching and learning in Norway. In T. Janìk & T. Seidel (Eds.), *The power of video studies in investigating teaching and learning in the classroom* (pp. 61-82). Münster: Waxmann.

Kloser, M. (2014). Identifying a core set of science teaching practices: A delphi expert panel approach. *Journal of Research in Science Teaching, 51*(9), 1185-1217. doi:10.1002/tea.21171

Kunzman, R. (2002). Preservice education for experienced teachers: What STEP teaches those who have already taught. *Issues in Teacher Education, 11*(1), 99–112.

Kvalbein, I. A. (2003). Norsk allmennlærerutdanning i et historisk perspektiv [Norwegian teacher education in a historical perspective]. In G. E. Karlsen & I. A. Kvalbein (Eds.), *Norsk lærerutdanning: Søkelys på allmennlærerutdanningen i et reformperspektiv* [Norwegian teacher education. Focus on teacher education in a reform perspective] (pp. 24–41). Oslo, Norway: Universitetsforlaget.

Lampert, M., Franke, M. L., Kazemi, E., Ghousseini, H., Turrou, A. C., Beasley, H., . . . Crowe, K. (2013). Keeping it complex: Using rehearsals to support novice teacher learning of ambitious teaching. *Journal of Teacher Education, 64*(3), 226–243. doi:10.1177/0022487112473837

LeTendre, G. K., & Wiseman, A. (Eds.). (2015). *Promoting and sustaining a quality teacher workforce* (Vol. 27). Bingley, UK: Emerald Group Publishing.

Lund, A., & Eriksen, T. (2016). Teacher education as transformation: Some lessons learned from a center for excellence in education. *Acta Didactica Norge, 10*(2), 53–72. Retrieved from https://www.journals.uio.no/index.php/adno/article/view/2483/2458

Martin, S. D., Snow, J. L. & Torrez, C. A. F. (2011). Navigating the terrain of third space: Tensions with/in relationships in school–university partnerships. *Journal of Teacher Education 62*(3), 299–311. doi:10.1177/0022487110396096

McDonald, M. A., Kazemi, E., & Kavanagh, S. S. (2013). Core practices and pedagogies of teacher education: A call for a common language and collective activity. *Journal of Teacher Education, 64*(5), 378–386. doi:10.1177/0022487113493807

McDonald, M. A., Kazemi, E., Kelley-Petersen, M., Mikolasy, K., Thompson, J., Valencia, S. W., & Windschitl, M. (2014). Practice makes practice: Learning to teach in teacher education. *Peabody Journal of Education, 89*(4), 500–515. doi:10.1080/0161956X.2014.938997

McDonald, M., Tyson, K., Brayko, K., Bowman, M., Delport, J., & Shimomura, F. (2011). Innovation and impact in teacher education: Community-based organizations as field placements for preservice teachers. *Teachers College Record*, *113*(8), 1668–1700. Retrieved from http://www.tcrecord.org/library/content.asp?contentid=16162

Moon, B. (Ed.). (2016). Do universities have a role in the education and training of teachers? An international analysis of policy and practice. Cambridge, England: Cambridge University Press.

Müller, M., Álamos, P., Meckes, L., & Sanyal, A. (2015). *Student teachers' perceptions of opportunities to develop core practices in a Chilean teacher education program.*

148

Paper presented at the European Conference on Educational Research (ECER), Budapest, Hungary.

Munthe, E., & Rogne, M. (2016). Norwegian teacher education: Development, steering and current trends. In B. Moon (Ed.), *Do universities have a role in the education and training of teachers? An international analysis of policy and practice* (pp. 35–55). Cambridge, England: Cambridge University Press.

NCATE. (2010). *Transforming teacher education through clinical practice: A national strategy to prepare effective teachers. Report of the Blue Ribbon Panel on Clinical Preparation and Partnerships for Improved Student Learning.* Retrieved from http://www.ncate.org/LinkClick.aspx?fileticket=zzeiB1OoqPk%3D&tabid=7

Niemi, H. (2016). Academic and practical: Research-based teacher education in Finland. In B. Moon (Ed.), *Do universities have a role in the education and training of teachers? An international analysis of policy and practice* (pp. 19–33). Cambridge, England: Cambridge University Press.

Niemi, H., & Jakku-Sihvonen, R. (2006). Research-based teacher education. In R. Jakku-Sihvonen & H. Niemi (Eds.), *Research based teacher education in Finland: Reflections by Finnish teacher educators* (pp. 31–47). Turku, Finland: Finnish Educational Research Association.

Norwegian Agency for Quality Assurance in Education. (2006). *Evaluering av allmennlærerutdanningen i Norge 2006. Del 1: Hovedrapport* [Evaluation of general teacher education in Norway 2006. Part 1: Main report]. Retrieved from http://www.nokut.no/Documents/NOKUT/Artikkelbibliotek/Norsk_utdanning/Evaluering/alueva/ALUEVA_Hovedrapport.pdf

Norwegian Government. (2014). *Innfører femårig lærerutdanning på masternivå* [Introduces five-year teacher education on master level] [Press release]. Retrieved from https://www.regjeringen.no/no/aktuelt/utsetter-krav-om-mastergrad-for-ppu/id2482527/

Organisation for Economic Co-operation and Development. (2014). *PISA 2012 results.* Retrieved from https://www.oecd.org/pisa/keyfindings/pisa-2012-results-volume-I.pdf

Pepper, S. K., Hartman, K. J., Blackwell, S. E., & Monroe, A. E. (2012). Creating an environment of educational excellence: The University of Mississippi-PDS Partnership-The evolution continues. *School–University Partnerships*, *5*(1), 74–88. Retrieved from http://files.eric.ed.gov/fulltext/EJ974370.pdf

149

Pianta, R. C., & Hamre, B. K. (2009). Conceptualization, measurement, and improvement of classroom processes: Standardized observation can leverage capacity. *Educational Researcher, 38*(2), 109–119. doi:10.3102/0013189x09332374

Protocol for Language Arts Teaching Observations [PLATO] 5.0. (2015, June). *Training and observation protocol.* Stanford, CA: Center to Support Excellence in Teaching (CSET), Stanford University

Rasmussen, J. (2008). Nordic teacher education programmes in a period of transition: The end of a well-established and long tradition of "seminarium"-based education. In B. Hudson & P. Zgaga (Eds.), *Teacher education policy in Europe: A voice of higher education institutions* (pp. 325–344). Umeå, Sweden: University of Umeå, Faculty of Teacher Education.

Reid, J.-A. (2011). A practice turn for teacher education? *Asia-Pacific Journal of Teacher Education, 39*(4), 293–310. doi:10.1080/1359866X.2011.614688

Sahlberg, P. (2011). Finnish lessons: What can the world learn from educational change in Finland? New York, NY: Teachers College Press.

Skarðhamar, A.-K. (2001). *Litteraturundervisning : teori og praksis* [The teaching of literature: Theory and practice] (2nd ed.). Oslo, Norway: Universitetsforlaget.

Sloan, T. F. (2015). Data and learning that affords program improvement: A response to the U.S. accountability movement in teacher education. *Educational Research for Policy and Practice, 14*(3), 259–271. doi:10.1007/s10671-015-9179-y

Solomon, J. (2009). The Boston Teacher Residency: District-based teacher education. *Journal of Teacher Education, 60*(5), 478-488. doi:10.1177/0022487109349915

Stake, R. E. (2006). *Multiple case study analysis*. New York, NY: Guilford Press.

Taylor, M., & Klein, E. (2015). A year in the life of a third space urban teacher residency: Using inquiry to reinvent teacher education. Rotterman, Netherlands: Sense Publishers.

Tigchelaar, A., & Korthagen, F. (2004). Deepening the exchange of student teaching experiences: Implications for the pedagogy of teacher education of recent insights into teacher behaviour. *Teaching and Teacher Education, 20*(7), 665–679. doi:10.1016/j.tate.2004.07.008

Tirri, K. (2014). The last 40 years in Finnish teacher education. *Journal of Education for Teaching, 40*(5), 600–609. doi:10.1080/02607476.2014.956545

Uusiautti, S. & Määtä K., (2013). Significant trends in the development of Finnish teacher training education programs (1860–2010). *Education Policy Analysis Archives*, *21*(59), 1–22. doi:10.14507/epaa.v21n59.2013

Valli, L. (1997). Listening to other voices: A description of teacher reflection in the United States. *Peabody Journal of Education, 72*(1), 67–88. Retrieved from http://www .jstor.org/stable/1493261

Wæge, K., & Haugaløkken, O. K. (2013). Research-based and hands-on practical teacher education: An attempt to combine the two. *Journal of Education for Teaching, 39*(2), 235–249. doi:10.1080/02607476.2013.765195

Windschitl, M., Thompson, J., Braaten, M., & Stroupe, D. (2012). Proposing a core set of instructional practices and tools for teachers of science. *Science Education, 96*(5), 878–903. doi:10.1002/sce.21027

Zeichner, K. M. (2010). Rethinking the connections between campus courses and field experiences in college- and university-based teacher education. *Journal of Teacher Education, 61*(1–2), 89–99. doi:10.1177/0022487109347671

Zeichner, K. M. (2012). The turn once again toward practice-based teacher education. *Journal of Teacher Education, 63*(5), 376–382. doi:10.1177/0022487112445789

Zeichner, K. M. (2016). The changing role of universities in US teacher education. In B. Moon (Ed.), *Do universities have a role in the education and training of teachers? An international analysis of policy and practice* (pp. 107–126). Cambridge, England: Cambridge University Press.

Errata

p. i -iii: Minor changes in Acknowledgements

p. ix, Article I: "(2016)" is changed to "(accepted for publication)" and "In review at" is deleted

p. ix, Article III: *"Teaching and Teacher Education"* is changed to *"European Journal of Teacher Education"*

p. 1, 2nd paragraph, line 1: "practice" is changed to "fieldwork"

p.3, 1st paragraph, line 7: "practice-based*"* is changed to *"grounded in practice"*

p. 3, 2nd paragraph, line 15: "In review" is changed to "accepted for publication"

p. 3, 3rd paragraph, line 3: "Manuscript submitted for publication." is deleted

p. 4, 3rd paragraph, line 8: *"Teaching and Teacher Education" is changed to "European Journal of Teacher Education"*

p. 11, 1st paragraph, line 4: "the" is deleted

p. 16, 2nd paragraph, line 3: "(" is changed to ","

p. 47, Table 3: "practice" is changed to "fieldwork"

p. 62, 3rd paragraph, line 1: "under review at *Journal of Teacher Education*:" is deleted

p. 62, 3rd paragraph, line 2: "(2016)" is changed to "(accepted for publication)"

p. 62, 3rd paragraph, line 5: "Manuscript submitted for publication." is changed to *"Journal of Teacher Education"*

p. 65, 2nd paragraph, line1: *"Teaching and Teacher Education" is changed to "European Journal of Teacher Education*"

p. 65, 4th paragraph, line 7: "categorized" changed to "categories"

p. 115: Appendix 5: Comparative Table: "practice" is changed to "fieldwork"

p. 129, Table 2: "practice" is changed to "fieldwork"

p. 157, Table 1: "practice" is changed to "fieldwork"

p. 159, Table 3: Countries are added to program numbers

p. 163, Table 5: *"(SD between Brackets)"* is added to the table heading

p. 163, Table 5: Countries are added to program numbers

p. 192, Table 2: *"(SD between Brackets)"* is added to the table heading

p. 192, Table 2: Countries are added to program numbers