

**Research-based teacher education**  
**Interactions between research and teaching**

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**Research-based teacher education**  
**Interactions between research and teaching**

Research-based opleiden van leraren  
Interacties tussen onderzoek en onderwijs  
*(met een samenvatting in het Nederlands)*

Proefschrift

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## Chapter 1 Introduction

“Surely the relationship should be reciprocal, so that practice informs theory as much as theory tests practice” (Rafferty, Allcock, & Lathlean, 1996, p. 689)

One of the main debates in educational research in general, and in research on teacher education in particular, revolves around the role of research. Growing attention is now being paid to the question of what effect educational research could or should have on teaching and teacher education (Biesta, 2007; Davies, 1999; Hargreaves, 1997; Slavin, 2002). Yet, throughout the literature, research and teaching are described as being fundamentally different (Bartels, 2003; Broekkamp & Hout-Wolters, 2007; Tyler, 2009), as they are reported to rely on different norms to ascertain what counts as knowledge as well as what accepted ways of knowledge development are (Akkerman, Bronkhorst, & Zitter, 2013). These differences are often claimed to be incommensurable and as a result a “gap” is said to exist between research and teaching, even in university-based teacher education programs (Korthagen & Kessels, 1999). Many consider this gap to be problematic, as most researchers, policymakers and educators agree that teacher education should benefit – in some way – from research. Several, highly diverse solutions have been proposed to cross or close this gap, varying from merely implementing teaching practices that have been proven to be effective (e.g., Slavin, 2002) to solely exploring problems that are truly relevant to teaching (e.g., Kaestle, 1993). These solutions apply to different levels of teacher education and go under different names, such as evidence-based education, inquiry-oriented teaching, building a culture of evidence and/or research-informed education.

In this thesis, we elaborate on the ideas on the role of research in teacher education that have been referred to as *research-based teacher education* (Kansanen, 2005; Kansanen, 2006), of which one can speak “when teaching and research on teaching are integrated” (Jyrhämä et al., 2008, p. 3). For most scholars studying research-based teacher education, this integration aims at improving the teaching of the teacher educators and of the student teachers learning to teach, by making use of research-based thinking and tools (Jyrhämä et al., 2008; Kansanen, 2006; Kynäslähti et al., 2006).

Surprisingly, the other side of this integration - improving research, by making use of teaching – is not mentioned, whereas in the literature one can find appreciation for the valuable contribution teaching can make to research (Kershner & Hargreaves, 2012; Sutter, 2011). However, as is the case with many educational innovations, “there does seem to be a lot more rhetorical writing about potential benefits than empirical inquiry into its processes and impacts” (Rickinson, Sebba, & Edwards, 2011, p. 16). Drawing on literature on horizontal development and boundary crossing (Akkerman & Bakker, 2011; Engeström et al., 1995; Tuomi-Gröhn & Engeström, 2003) and on user engagement (Edwards, Sebba, & Rickinson, 2007; Rickinson et al., 2011; Saunders, 2007), this dissertation explores the interactions between research and teaching, taking different forms in different encounters in teacher education. We explore *how research on teacher education can benefit from interactions between research and teaching*.

## Interactions between research and teaching

In this dissertation we define research-based teacher education as *the ongoing and mutually informing interactions between research and teaching - taking different shapes, and on different levels - in teacher education*. The fundamental assumption underlying this dissertation is that although the interactions between research and teaching may give rise to discontinuities, as a “boundary” can be experienced (Ball, 1995), research can capitalize on these discontinuities in ways that benefit both research and teaching. This assumption is based on research on boundary crossing (Akkerman & Bakker, 2011; Engeström et al., 1995) and generally shared by scholars that draw on third generation cultural-historical activity theory (CHAT) (Engeström & Sannino, 2010; Roth & Lee, 2007; Sannino & Sutter, 2011), who study the interactions that take place at the intersection of different activity systems. Based on their studies, these scholars argue that socio-cultural differences between practices that give rise to discontinuities can be resources for learning and development.

This main assumption, in turn, relies on several other assumptions. Two of these particularly deserve more consideration, namely that, first, teaching and research can be seen as different epistemic practices (Knorr-Cetina, 1999), with their own history and traditions, which can give rise to discontinuities; and that, second, to capitalize on the interactions between research and teaching, these interactions should be seen and shaped as reciprocal (Trainor & Bouchard, 2012). We elaborate on these assumptions in the following sections.

### Research and teaching as different epistemic practices

“Teacher education is of its very nature Janus-faced. In the one direction it faces classroom and school, with their demands for relevance, practicality, competence, techniques. In the other it faces the university and the world of research, with their stress on scholarship, theoretical fruitfulness and disciplinary rigour.” (Murray & Male, 2005, p. 138, citing Taylor's (1983) John Adams Memorial Lecture)

Often, when interactions between research and teaching are studied in teacher education, or other educational settings, authors refer to them as theory and practice (Korthagen & Kessels, 1999). Even though theory and practice are often meant as proxies or representatives of research and teaching, they seem to imply that teaching is an a-theoretical or theory-less practice, and that research develops theories without a practice (Stokking, 2012). As such, the use of these proxies neglects the fact that research and teaching can be understood as different *epistemic practices*, as they rely on different norms to ascertain what counts as knowledge and what counts as accepted ways of knowledge development (Akkerman et al., 2013). Epistemic practices have been defined as “the reasoning and discursive practices involved in making and evaluating knowledge” (Sandoval & Reiser, 2004, p. 368). The concept derives from the work of Knorr-Cetina (1999), who - based on extensive ethnographic studies of scientific laboratories - coined the term epistemic culture to refer to “sets of practices, arrangements and mechanisms bound together by

necessity, affinity and historical coincidence which, in a given area of professional expertise, make up how we know what we know” (p. 363). Her research elaborated on other studies that questioned the image of research as an entirely rational enterprise, relying on objective procedures (e.g., Latour & Woolgar, 1979). As a result, scientific knowledge production is increasingly understood as being cultural, and research is no longer seen as the sole knowledge producer for education (Ball, 1995).

Understanding teaching and research as different epistemic practices resonates with how, throughout the literature, teaching and research are described as being fundamentally different (Ball, 1995; Bartels, 2003; Broekkamp & Hout-Wolters, 2007; Tyler, 2009). Generally, interactions between different epistemic practices can give rise to discontinuity, as a result of the socio-cultural differences that exist between these practices (Akkerman & Bakker, 2011). Discontinuity is experienced when ongoing processes, such as learning and development, are hampered over time and space. The abundant use of the term “gap” or “boundary” indicates that this also appears to be the case for interactions between research and teaching. This makes these interactions demanding, as “crossing boundaries involves encountering difference, entering onto territory in which we are unfamiliar and, to some significant extent, therefore unqualified” (Suchman, 1994, p. 25). Yet, as we will substantiate later on, it is in this challenge that the potential lies, as these interactions can compel transformation of the intersecting practices.

In understanding research and teaching as epistemic practices, the interactions between them can take different forms and can take place on different levels. Interpersonal interactions between research and teaching in teacher education are studied extensively (Meyer Reimer, 1994; Nilsson, 2008). Often, this refers to the collaboration, or lack thereof, between researchers and educators, or researchers and teachers representing their respective practice (Ball, 1995). Other interactions between research and teaching take shape as a dialogue between theories, which are seen as the reification of the knowledge produced in research, and practical knowledge, as in teaching knowledge is often more intangible, but evident through actions (Meijer, Zanting, & Verloop, 2002). Intrapersonal interactions that occur “in someone’s head” when an individual participates in both practices, are studied less often. Research and teaching are then considered to be different I-positions or voiced positions, that is, “a speaking personality bringing forward a specific viewpoint” (Akkerman & Meijer, 2011, p. 311), which can also conflict. As can be deduced from this, if someone or something may be understood, by themselves or by others, to represent research or teaching is not fixed, but dialogical, depending what is used as a comparison (Akkerman & Niessen, 2011). For example, teacher educators are often seen as representatives of teaching in this dissertation, but when they interact with teachers in schools – for instance in supervising student teachers - educators are often seen as representatives of research (Tsui & Law, 2007).

### **Research-based teacher education as *interaction***

The literature on the potential role of research in teacher education typically employs a transfer metaphor. Transfer derives from the Latin word *transferre*, which means “to bring” or “to carry” (Tigheelaar,

submitted) and research thus explores how the products and tools of research can be applied to teaching. In the context of research and teaching in teacher education, transfer of research findings (Randi & Corno, 2007), of research methodology or skills (Jyrhämä et al., 2008) and of a research attitude (van der Linden, Bakx, Ros, Beijaard, & Vermeulen, 2012) have been advanced. Moreover, these different research “products” can be transferred to different levels of teacher education (Kansanen, 2006): research can make the design of a teacher education program research-based, it can be transferred to teacher educators to make their pedagogy research-based and it can be used to make student teachers’ teaching research-based, by informing them about research findings, and asking them to use research methods to develop their own understandings.

A general criticism of the transfer metaphor in learning sciences research is that it aims at keeping the transferred research “products” intact (Hager & Hodkinson, 2009; Tuomi-Gröhn & Engeström, 2003). That is to say, these research findings or methodology are seen as valuable as they are, without reference to contextual influences in either the creation of research or in its application in teaching. This can be seen as the result of developments in the past as “traditionally, research and practice have maintained a reciprocal separation: Researchers are thought to produce knowledge; teachers are supposed to apply such knowledge in their practice” (Ball, 1995, p. 358). However, this seems to imply that knowledge and methods of knowledge development (i.e. methodology) are value and context free, as they can be transferred unproblematically (Carlile, 2004). In the context of teacher education, this conception seems to underlie initiatives that go under the heading of evidence-based teacher education (Slavin, 2002).

However, as research and teaching in teacher education can be considered as two different epistemic practices, one can assume that the products of research require adaptation to teaching, a process that is often conceptualized as translation (Carlile, 2004). Although translation derives from the same Latin word *transfere* (*latus* is the past participle of the verb *ferre*), translation is understood to include adjusting to the recipient. Studies drawing on this metaphor often argue that adaptations afford a better application in the educational context at hand (Billett, 2001a) and explore the processes involved in successfully translating knowledge from research to teaching (Guile & Young, 2003).

Currently, studies of research-based teacher education employ a transfer or the translation metaphor. Scholars studying research-based teacher education advocate that teaching in teacher education can benefit from research, in terms of the knowledge it generates about educating future teachers and the practices it uses to do so (Kansanen, 2005; Kansanen, 2006). It is not acknowledged that this process could also be bi-directional (Nilsson, 2008) or reciprocal (Trainor & Bouchard, 2012); the movement *from* research *to* teaching is advanced - and investigated - not the other way around. This limitation is recognized by many researchers drawing on socio-cultural and CHAT theories (e.g., Beach, 1999; Guile & Young, 2003; Konkola, Tuomi-Gröhn, Lambert, & Ludvigsen, 2007; Tuomi-Gröhn & Engeström, 2003; van Oers, 1998b), who have subsequently advocated the use of concepts as transition, referring to the individuals that move between practices, and transformation, referring to changing the shape or form of a practice as a result of an interaction between practices. In spite of prefix *trans*, which implies moving

across or beyond something, in transition and transformation the interaction between research and teaching is considered to be reciprocal. In research on teacher education, transitions are often studied in terms of their impact on identity, for instance in terms of student teachers' simultaneous participation in higher education as a student and their participation at school as a teacher or intern (e.g., Beauchamp & Thomas, 2011). Similarly, research on teacher education that studies transformations usually involves an intervention targeted at transforming mentoring and supervision practices, which occur at the intersection of higher education and secondary schools (e.g., Tsui & Law, 2007).

As this dissertation explores different manifestations of another intersection, namely that of research and teaching, and to emphasize the bi-directionality of interactions, we refer to interactions *between* research *and* teaching. These interactions can refer to the various characteristics of persons and objects, representing research or teaching, that act upon one another to produce a new effect, at different levels of analysis.

### The present studies

Departing from these assumptions, a great deal of unexplored territory emerges, as there has been more rhetoric than empirical exploration of the benefit that interactions between research and teaching can have for research (Rickinson et al., 2011). A general premise shared by those that advance reciprocal interactions, in line with third generation CHAT (Engeström & Sannino, 2010), is that the advantage of these interactions actually results from the differences that appear to exist between research and teaching (Sandoval & Reiser, 2004). Similarly, Yamazumi (2008) argues that contradictions – tensions resulting from historically evolved differences - between practices have the potential to energize joint efforts at transforming practices, rather than prevent change, as is often assumed when referencing to a “gap” between research and teaching (e.g., Cheng, Cheng, & Tang, 2010).

Consequently, from this perspective, teaching is seen as providing a potentially unique perspective (Almekinders, Beukema, & Tromp, 2009; Kershner & Hargreaves, 2012; Rickinson et al., 2011) that enriches research. This enrichment can refer to concepts or theories (e.g., Rafferty et al., 1996), but also to methodology (e.g., Almekinders et al., 2009), although their enrichment often appears to go hand in hand. Referring to collaboration between researchers and student teachers, Kershner and Hargreaves (2012) found that “the collaborative approach had the advantage of *elaborating the conceptualisation beyond our original thinking*, grounded in the purpose, coherence and relevance of the students' various school-based projects.”(p. 290 emphasis added).

Different practitioners of the epistemic practice of teaching have been found to voice “distinctive positions” (Kershner & Hargreaves, 2012), which are important to bring different aspects of the object under study to the fore, as we can learn from research on data source triangulation (Meijer, Verloop, & Beijaard, 2002). Diverse perspectives are also considered to be necessary for innovation or change of practices to occur (Nilsson, 2008; Rickinson et al., 2011). Elaborating on these initial findings and

assumptions, our first research question is *how do interactions between research and teaching in teacher education benefit research?* We can understand the benefit for research as an improvement in research quality. As different frameworks for research quality exist, we will draw on Guba (1981), who discerned four general quality concerns in social scientific research, irrespective of the paradigm in which a researcher operates. *Truth value*, often referred to as internal validity or credibility, concerns the confidence in the “truth” of the findings. *Applicability*, often referred to as external validity, generalizability or transferability, concerns the extent to which the findings may be applicable to other settings. *Consistency*, often referred to as reliability or dependability, concerns the consistency of the methods used. *Neutrality*, often referred to as objectivity or confirmability, concerns the degree to which the findings are free from various sorts of bias of the researcher. Based on the explorations thus far, we might expect interactions between research and teaching to benefit the truth value and neutrality of research findings.

Given that interactions between research and teaching are always “about something”, we framed the content of these interactions in terms of enriching student teacher learning and development, focusing on fostering student teachers’ *meaning-oriented learning* and *deliberate practice* in teacher education. We elaborate on these concepts and the reasons for choosing them within the scope of the dissertation section.

The benefit of interactions between research and teaching is not reached easily, as differences between, for instance, the tools, norms and values of research and teaching practices can conflict (Akkerman et al., 2013). Rickinson, Sebba and Edwards (2011) summarized the challenges of interactions between research and teaching, when they are designed to benefit research. This resulted in three recommendations. First, they recommend *acknowledging and weaving together the different purposes of research for the different participants*, especially in light of the potential tension between different individuals’ goals and collective motives (Kershner & Hargreaves, 2012). These different purposes come to the fore prominently when decisions need to be made that involve trade-offs. As a result, Sannino and Nocon (2008) recommend the continuous confrontation of, and work on, the conflicts or tensions that can arise between as a result of different purposes. Another recommendation involves *planning for different timescales* for each group of participants. Referring to a collaborative research project at a school, Nocon (2008) argues that researchers only tend to be present (to interact) on a part-time basis, which contrasts with the long-term presence and involvement of teachers. Akkerman, Bronkhorst and Zitter (2013) also discovered that managing time can be a challenge, as research and teaching tend to operate on different time frames, valuing thoroughness and timely applicability differentially. Lastly, managing time and weaving together different purposes successfully, can prove challenging for coordination. *Maintaining the engagement of all parties in and with the research* is the third recommendations mentioned by Rickinson and colleagues (2011), and they advance developing so-called “relational expertise” (Edwards et al., 2007) to achieve this.

These recommendations do not exist in isolation, which makes it more fruitful to explore the conditions under which interactions between research and teaching can be (come) beneficial. The studies in this dissertation further explore these recommendations to investigate *under what conditions interactions*

*between research and teaching in teacher education can benefit research*, which is our second research question. These conditions can apply to research, to teaching, and also to the interactions between them.

### Scope of this dissertation

We agree with Kansanen (2006) that research on teacher education materializes in the educational context in which it is situated. Therefore, before presenting an overview of the different studies in this dissertation, we will provide a description of the context and the substantive content of our studies.

#### *Context*

There are different teacher education programs in the Netherlands. Programs that prepare for teaching primary education and the lower grades of secondary education are offered by professional universities. Normally, these are four year, comprehensive programs, which students enter after completing senior general secondary education or pre-university education (in Dutch: havo and vwo). The teacher education program for teaching the higher grades of secondary education is offered by universities as a post-graduate program, after completion of a subject-specific master's degree. In contrast to primary school teacher education, all secondary school teacher education programs are subject-matter specific. All teacher education programs include a large teaching practice component, culminating in the last semester being at least partly situated in schools. Hence, student teachers are taught by both institute supervisors as well as school-based mentors, both being regarded as teacher educators. Contrary to countries such as the United States, where teacher educators complete doctoral studies at universities in curriculum and instruction studies or related areas, in the Netherlands teacher educators, at school and at the institute, are often experienced and accomplished teachers in a specific subject (Hamilton & Clandinin, 2011). The six studies described in this dissertation are all conducted in the context of university-based teacher education in the Netherlands. These programs normally last one year and lead to subject-specific teaching licenses to teach all grades of secondary education. About half of the program is situated in school, either as an internship or as a paid job, which is why we refer to them as *dual* programs. In this dissertation, we focus on the institute part of these programs.

In the first study, described in the second chapter, educators from different university-based teacher education institutes<sup>1</sup> that offer such programs are consulted. The subsequent studies are conducted at the teacher education program offered by Utrecht University, a large university in the Netherlands. The program offers 18 different subject-matter specific tracks. Students enter the program after obtaining a subject master's degree (e.g., math, history). The program's pedagogy has been described in numerous studies (e.g., Korthagen & Kessels, 1999; Tigchelaar & Korthagen, 2004) and has served as a foundation for describing fundamental principles of teacher education (Korthagen, Loughran, & Russell,

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<sup>1</sup> As was common in the Netherlands in the last decades, the teacher education programs in Dutch universities were institutionalized separate from disciplinary faculties.

2006). The program's educational philosophy has been described as realistic (Korthagen, Kessels, Koster, Lagerwerf, & Wubbels, 2001), in that it takes student teachers' teaching experiences (i.e., their concerns) as a starting point for student teachers' learning and development and actively seeks to link these experiences to theory in teacher education classes. This institute that offers this program can be characterized by its emphasis on reflection and self-regulation, with regard to the professional conduct of the educators, trainers and researchers working there.

### ***Content***

Interactions between research and teaching are always "about something". We deliberately framed the content of these interactions in terms of enriching student teacher learning. This was expected to be a topic of interest for both research and teaching, which is one of the main objectives that they have in common in the context of teacher education, as well as a content area that would most likely benefit from interactions between research and teaching.

Our starting point for the studies reported in this dissertation, is the literature on research-based teacher education, which often distinguishes between a basic and a conceptual level (Jyrhämä et al., 2008; Krokfors et al., 2011; Kynäslähti et al., 2006). At the basic level, student teachers learn how to teach. At the conceptual level, student teachers learn how to think critically as a teacher. This is similar to a well-known distinction pointed out by Russell and Loughran (2007) who argued that teacher education bears a dual responsibility in educating its student teachers: it has to prepare student teachers for current practice by fostering the fundamentals of teaching, but also assure that student teachers learn how to learn as a teacher, to be able to continue their professional development after completing teacher education. At the teacher education program offered by Utrecht University, these two responsibilities play a major role, as student teachers are evaluated on their "proficiency to start" working as a teacher and their "proficiency to continue developing". This proficiency to continue developing, or learning how to learn as a teacher, has been explored in research (Endedijk & Vermunt, 2012; Endedijk, Vermunt, Verloop, & Brekelmans, 2012; Endedijk, Vermunt, Meijer, & Brekelmans, 2013) as well as in teaching (Korthagen et al., 2001; Korthagen, 2004; Korthagen et al., 2006; Tigchelaar & Korthagen, 2004) at Utrecht University. However, in light of new developments in research and new challenges in teaching, the representatives of research and teaching involved in this dissertation felt this issue deserved further exploration.

There is a growing body of research indicating not only how student teachers learn, but also what obstacles student teachers face during their education and in continuing to learn when they are full-fledged professionals. Generally, in research on student learning, researchers express an empirical or conceptual preference for deep or *meaning-oriented learning* (Baeten, Kyndt, Struyven, & Dochy, 2010; Gordon, Debus, Dillon, & Arthur-Kelly, 2006). Oosterheert and Vermunt (2001) studied student teachers' learning in the context of learning to teach in dual teacher education programs. They distinguished different learning orientations, later conceptualized as learning patterns (Endedijk & Vermunt, 2012; Vermunt & Endedijk, 2011). From the perspective of research and of teaching, a *meaning-oriented learning* pattern is preferred, as it involves learning to teach by trying to understand the underlying processes that play a role in teaching and

learning. It is similar to the critical pedagogical thinking or the conceptual level of teaching that sets research-based teacher education apart from other teacher education programs (Kansanen, 2006). Consequently, it encompasses actively comparing sources and drawing conclusions from this comparison for teaching (Zanting, Verloop, & Vermunt, 2001), and it also entails a discussing with other (student) teachers and teacher educators, as student teachers with this learning pattern tend to value input beyond their existing frame of reference. There is a clear indication in the literature that it is exactly the understanding of (the effects of) teaching that makes the difference in teacher quality (Darling-Hammond, 2000; Feiman-Nemser, 2001). A comprehensive review of best practices in the United States has indicated that teacher education curricula that foster such deep understanding stand out in their performance (Darling-Hammond, 2006). Nevertheless, it is evident from both research and teaching that not all programs cultivate such learning and clear cut solutions on how to foster it are currently not available in the literature. On the contrary, pedagogies stimulating understanding the underlying processes of teaching by means of reflection had been developed at the teacher education institute (Korthagen et al., 2001; Korthagen et al., 2006).

However, teacher education pedagogies are increasingly being criticized for their exclusive focus on the cognitive processes of learning to teach (Fairbanks et al., 2010; Grossman, Hammerness, & McDonald, 2009), even though practicing teaching is also necessary for (expertise) development. In contrast, researchers in various domains of expertise development found that expertise is primarily the result of individual *deliberate practice* (Ericsson, Krampe, & Tesch-Römer, 1993). This is defined as the prolonged engagement in practice specifically designed and intended to improve individual performance. Experts do not undergo experiences, they deliberately shape them, whereas practicing teaching in teacher education tends to be reactive rather than deliberate (Williams, 2003). By learning how to practice teaching deliberately early in their development, student teachers learn how to design their teaching in such a way, that it matches their understanding. Deliberate practice for teaching expertise has not been researched extensively. Dunn and Shriner (1999) came to the conclusion that it entailed daily practices in terms of classroom preparation and evaluation, intended primarily to increase student learning. They postulate that “the frequent and mindful engagement in these activities may be what counts for expertise” (p. 631), or in other words the deliberation of the practice of teaching. Therefore, although deliberate practice seems promising to nurture student teacher professional development during teacher education and afterwards, how to foster it in a curriculum remains to be explored.

In sum, the majority of the studies reported on in this dissertation depart from the assumption that if teacher education programs want to prepare student teachers adequately for their profession and continuous professional development, they should foster meaning-oriented learning and deliberate practice. The content-specific contribution resulting from the interactions between research and teaching in this dissertation is thus to inform and refine both the theory on meaning-oriented learning and deliberate practice, as well as the theory on how they can be fostered in teacher education.

## Structure of the dissertation

In the following six chapters, six empirical studies are described, that explore different interactions between research and teaching. In the first three chapters (2-4), interactions between research and teaching are seen as a (methodological) tool that can potentially benefit our understanding of fostering student teachers' meaning-oriented learning and deliberate practice. In the last three chapters (5-7), the interactions between research and teaching become the object of our analysis.

### *Part 1: Interactions exploring meaning-oriented learning and deliberate practice*

**Chapter 2** departs from existing research on teacher education; more specifically research into the challenges involved in learning to teach. There are several indications that some student teachers deal with these challenges better than others and that these differences might be related to the nature of student teachers' learning and the nature of their practice. Meaning-oriented learning and deliberate practice are advanced as ways of learning that may not only be effective in successfully overcoming these challenges in learning to teach, but also foster continuous professional development throughout teaching careers. However, knowledge of how to foster meaning-oriented knowledge and deliberate practice is not widely available in the literature, whereas it is very plausible that expert teacher educators have expertise in this respect. We interviewed expert teacher educators to explicate their expertise and subsequently compared their knowledge to the existing literature.

In **chapter 3** the interactions between research and teaching also take place on a conceptual level. In this chapter, we explore the concept of deliberate practice in more detail. As deliberate practice has not been studied extensively in teaching, let alone teacher education, we engaged in a qualitative in-depth exploration of the characteristics of student teachers' learning activities in a dual teacher education program. We analyzed 574 learning activities, which student teachers reported had been meaningful in their professional development, using the four characteristics of deliberate practice as a frame of reference.

The results of chapters 2 and 3 were used as starting points for two parallel formative interventions, which are described in **chapter 4**. In formative interventions, the interactions between research and teaching are interpersonal. In this longitudinal study, a researcher-interventionist collaborated with two teams of educators in further developing pedagogies, based on the design principles developed in chapter 2, and the insights of chapter 3, to foster meaning-oriented learning and deliberate practice and through that process, extend the existing understanding of how this can be done.

### *Part 2: Exploring the interactions*

Two distinct aspects of the interactions between research and teaching in these formative interventions are explored in more detail in subsequent chapters, as we felt they deserved more attention. **Chapter 5** delves into the methodology of formative interventions as a relatively unknown research methodology in research on teacher education. We focused on the interpersonal interactions between the researcher-

interventionist and the educators in working on a shared challenge in the formative intervention. We explored the consequences of such interpersonal interactions on research quality, by analyzing how educators' experiences in this formative intervention differ from their previous experiences in research.

We proceeded to explore intrapersonal interactions between research and teaching. **Chapter 6** focusses on two "outliers" of the formative interventions described in chapter 4: two student teachers' who voice resistance to the pedagogies used in the teacher education program during that formative intervention. Such resistance is often understood as a lack of quality of the student teacher and/or attributed to his placement school, and is expected to impede learning. In contrast, we suggest that when seeing resistance as interactive in nature, and as potentially constructive, this invites us to explore the origin of the resistance, namely conflicting cultures of learning and teaching, which the student teachers understand as being "scientific" or "school-like". By means of a longitudinal, cross-case analysis, we investigated the ways in which educators can support student teachers in exploiting these intrapersonal interactions between research and teaching for their own learning.

Chapter 6 concludes by examining the difficulties that student teachers can incur in using pedagogies aiming to stimulate meaning-oriented learning and deliberate practice in a broader framework, pointing to the discontinuities that are being experienced between different practices of learning and teaching. In general, in the literature, in interactions between different practices, and more specifically between research and teaching, continuity appears to be favored over discontinuity. To increase our understanding how continuities and discontinuities between research and teaching are actually experienced over time, we explored two contrasting, year-long collateral transitions between research and teaching in **chapter 7**. Our analysis aimed at deducing conditions under which interactions between research and teaching on an intrapersonal level could be supported.

We conclude this dissertation with a discussion in **chapter 8**, in which we revisit the assumptions presented in this introduction. The different chapters of this dissertation can be read independently, as they are based on articles that have been published in or submitted to international journals. As a consequence, some overlap between the chapters is inevitable. Table 1.1 presents an overview of the different chapters.

Table 1.1 *Overview of the dissertation*

Chapter	Title	Aims / Research questions	Central concepts	Design	Unit of analysis
1	Introduction	Presents the theoretical assumptions, the scope (context and content) and an overview of the dissertation			
<i>Part 1: Interactions exploring meaning-oriented learning and deliberate practice</i>					
2	Fostering meaning-oriented learning and deliberate practice in teacher education	(1) How can meaning-oriented learning and deliberate practice be defined in the context of learning to teach according to expert teacher educators? (2) How can meaning-oriented learning and deliberate practice be stimulated in learning to teach according to expert teacher educators?	Meaning-oriented learning, deliberate practice	Retrospective; in-depth interviews	12 expert teacher educators
3	Deliberate practice in teacher education	What is the nature of deliberate practice for students in a dual teacher education program? (a) In what ways are student teachers' learning activities designed, repeated, coupled with feedback, and motivated? (b) In what ways do deliberate practice activities differ from other learning activities?	Deliberate practice	Longitudinal; learning logs	574 learning logs from 63 student teachers
4	Intended unexpected findings: insights developed in formative intervention research	What insights and practices on fostering meaning-oriented learning and deliberate practice within an existing teacher education curriculum are developed in two parallel year-long formative interventions, building on the ideas captured in the design principles?	Meaning-oriented learning, deliberate practice	Formative intervention; collaborative sessions, lesson plans, interviews	2 teams of educators, 26 and 12 student teachers, 1 researcher-interventionist.

*Part 2: Exploring the interactions*

5	Consequential research designs	How do educators experience formative intervention research compared to other research designs?	Engagement, research quality	Case study; group interview and logbook	2 educators and 1 researcher-interventionist
6	Conflicting cultures of teaching and learning	What are the implications of understanding student teachers' resistance in a teacher education program with innovative pedagogies as being interactive and potentially constructive?	Resistance, teacher education pedagogy, boundary crossing	Longitudinal case study; portfolio texts and meetings	2 student teachers, 1 teacher educator
7	Continuity and discontinuity between research and teaching	1) What continuities are encountered in a year-long collateral transition between research and teaching and how are they experienced? 2) What discontinuities are encountered in a year-long collateral transition and how are they experienced?	(dis)continuities, consequential transitions	Longitudinal self-study; weekly logs	84 weekly logs from 1 researcher and 1 teacher educator
8	Discussion	Presents a meta-perspective on the studies described in this dissertation			

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## **Chapter 2 Developing design principles to foster meaning-oriented learning and deliberate practice in teacher education<sup>2</sup>**

### **Abstract**

Meaning-oriented learning and deliberate practice may be expected to promote student teachers' continuous professional development. We interviewed twelve expert teacher educators to explore their understanding of these concepts, as well as pedagogies to stimulate meaning-oriented learning and deliberate practice in teacher education. The experts understood deliberate practice in two ways: an enactment conceptualization focusing on pupil learning, and a regulation conceptualization focusing on teacher learning. Pedagogies were operationalized in twelve design principles. Comparing them to the existing literature indicated that the notions reified in these principles integrated ideas previously scattered across the literature. Anticipatory reflection, diverse ways of “modeling”, and student teacher agency in creating a powerful learning environment are presented as valuable additions to the existing literature.

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<sup>2</sup> This chapter is based on Bronkhorst, L. H., Meijer, P. C., Koster, B., & Vermunt, J. D. (2011). Fostering meaning-oriented learning and deliberate practice in teacher education. *Teaching and Teacher Education*, 27, 1120-1130. doi: 10.1016/j.tate.2011.05.008

## Introduction

“What students learn is directly related to what and how teachers teach; and what and how teachers teach depends on the knowledge, skills, and commitments they bring to their teaching and the opportunities they have to continue learning in and from their practice.” (Feiman-Nemser, 2001, p. 1013).

It is increasingly recognized that currently teacher education programs may not secure successful lifelong teaching practice (Lieberman & Pointer Mace, 2008). The pace and size of educational reforms witnessed worldwide necessitate learning throughout the profession. Seeing that systematic support for teacher learning during the profession is scarce, this means that teacher education programs bear a dual responsibility (Russell & Loughran, 2007). They have to prepare their student teachers for current teaching practice by fostering the fundamentals of teaching (Grossman et al., 2009), but also insure that student teachers learn how to continue learning successfully after teacher education has been completed (Fairbanks et al., 2010; Kremer-Hayon & Tillema, 1999). Currently, the international teacher education literature discusses each of these responsibilities separately; one school of thought revolves around student teacher learning and another around professional learning and the development of expertise. In this chapter we combine concepts from both schools, representing ideas and experiences from various parts of the world, and argue that together *meaning-oriented learning* and *deliberate practice* represent the crux of what it means to (learn to) learn as a teacher. However, pedagogies, here defined as instructional strategies, to stimulate meaning-oriented learning and deliberate practice are not readily available. Drawing on expert teacher educators as informants, this chapter sets out to shed light on the conceptualization of meaning-oriented learning and deliberate practice in learning to teach, as well as to describe ways in which they can be stimulated in teacher education.

### *Challenges in learning to teach*

The twofold responsibility of teacher education is not without well-documented challenges. Darling-Hammond (2006b) summarized a great deal of the international research on learning to teach by formulating three challenges unique to the profession: the apprenticeship of observation, the problem of enactment and the complexity of teaching. First of all, in learning to teach student teachers have to address initial beliefs resulting from their extensive educational experience as a student. Lortie coined the term “apprenticeship of observation” to describe this phenomenon (Lortie, 1975). These beliefs are resistant to change (Pajares, 1992), but not always beneficial to learning to teach as they tend to be somewhat traditional. Second, student teachers not only have to learn what a teacher should know, but also how to put gained knowledge into action, which has been labeled the “problem of enactment” (Kennedy, 1999). Successful enactment requires the formulation of intentions - based on teaching knowledge, coupled with procedural knowledge of how to use that knowledge in action and the chance actually to do so in teaching. All of these steps are notoriously difficult and not always adequately

supported in teacher education (Grossman et al., 2009). Third, the teaching profession itself can be characterized by its complexity as it lacks routine, requires facing and balancing multiple goals, and relating to the needs of diverse learners, all of which require the integration of various sorts of knowledge (Hammerness, Darling-Hammond, & Bransford, 2005). This integration is often problematic for those learning the profession (Korthagen & Kessels, 1999), but also for more experienced teachers (Bakkenes, Vermunt, & Wubbels, 2010).

### *Student teacher learning*

The recognition of these challenges gave rise to research on how *student* teachers deal with them. Initial studies showed that some student and beginning teachers are better at dealing with these challenges than others (LaBoskey, 1994). Differences between student teachers' ability to deal with these challenges successfully have been attributed to a variety of personal and contextual causes, and corresponding solutions have been proposed. Most widely known solutions in this respect are teachers' reflective abilities (e.g., Conway, 2001) and teacher communities (e.g., Lieberman & Pointer Mace, 2008). Correspondingly, pedagogies have been introduced to stimulate student teachers' reflective abilities as well as policies that incite the development of communities in schools. Notwithstanding the importance of these pedagogies, we concur with authors from different European countries who argue that it is the nature of student teachers' learning and development that should be taken into account (cf. Bakkenes et al., 2010; Donche & Van Petegem, 2009; Endedijk, 2010; Opfer, Pedder, & Lavicza, 2011).

The literature on students' approaches to learning has indicated that there appears to be a difference between deep and surface learning, also framed as meaning-oriented and reproduction-oriented learning (Baeten et al., 2010). Arguing that student *teachers'* learning is unique, especially in teacher education programs with a large practical component, Oosterheert and Vermunt (2001) set out to study the nature of student teachers' learning. Taking into account learning conceptions, learning activities, emotion regulation and regulation of learning, these authors distinguished between different orientations to learning to teach which were survival-, reproduction-, or meaning-oriented in nature.

A survival orientation to learning to teach can be characterized by the complete captivation of immediate teaching practice, leaving little room for learning. Reproduction-orientated student teachers direct their learning to improving teaching performance and have little room or attention for developing a frame of reference for teaching. Meaning-oriented learning can also be characterized by the attention paid to improve teaching performance, but also by the *value afforded to and the effort invested in understanding the underlying processes that play a role in teaching*.

A meaning orientation consists of actively comparing sources and drawing conclusions from this comparison for own teaching practice (Zanting, Verloop, & Vermunt, 2001). Student teachers with this orientation actively seek to combine information from different sources. Moreover, as meaning-oriented student teachers' reflection goes beyond evaluation of what works but also includes critical analysis of why something may or may not work (Mansvelder-Longayroux, Beijaard, Verloop, & Vermunt, 2007), this orientation leads to an understanding of how pupils learn. Bakkenes and colleagues (2010) reported that

even daily teaching activities accompanied by a meaning-oriented reflection induce more learning than those accompanied by a reflection focused on performance. Lastly, the ability to apply knowledge across situations (i.e. enactment) is thought to increase when learners seek to understand the structure and critical elements of every situation (Korthagen & Kessels, 1999). Next to a conceptual preference for meaning-oriented learning, expressed by many authors (Baeten et al., 2010), empirical results also indicate that it is exactly the understanding of (the effects of) teaching that makes the difference in teacher quality, according to a comprehensive review of best practices in the United States (Darling-Hammond, 2006b) as well as recently completed study in the Netherlands (Bakkenes et al., 2010).

In sum, research conducted in different parts of the world indicates that if student teachers' learning were meaning-oriented in nature, they would become better equipped to deal with the challenges of the profession. However, knowledge on how teacher education programs can foster meaning-oriented learning is currently not widely available. Moreover, a recent review indicated that influencing the nature of students' learning is not an easy task (Baeten et al., 2010).

Next to this, the challenge of enactment and dealing with the complexity of teaching highlight the differences between learning as studied in educational settings (i.e. studying) and professional learning (Tsui & Law, 2007), and pinpoint the fact that learning to teach entails more than knowledge development (Fairbanks et al., 2010). Traditional teacher education programs have been criticized for not being responsive to these differences, as the programs were commonly organized analogous to other academic subject curricula (Korthagen & Kessels, 1999) and did not include a practicum. Hence, these challenges were deferred to after the completion of teacher education. Responding to this criticism, many teacher education programs across the world have adjusted their structural characteristics and now include a substantial practicum component (Zeichner, 2010). The mere inclusion of a practicum in their programs, however, does not necessarily resolve these challenges (Brouwer & Korthagen, 2005), as beginning teachers reorient their practice after graduation (Allen, 2009). Studies in the United Kingdom, a frontrunner in this trend, have indicated that student teachers differ in the nature of their practice (Hagger & McIntyre, 2000; Hagger, Burn, Mutton, & Brindley, 2008), which we believe is not sufficiently captured in the school of thought on student teacher learning.

### ***Teacher continuous professional development***

Teacher education's second responsibility to foster student teachers' continuous professional development is informed by different schools of thought that explore professional or workplace learning and expertise development. Research in this domain has also found some significant challenges, some specific to the teaching profession. A Dutch study (Van Eekelen, Vermunt, & Boshuizen, 2006) captured two important elements in this process: the *will* and *way* to learn. These authors of this study argued that seeing as there is hardly any external incentive for continuous professional development and therefore, all continuous development motives (i.e. the *will* to learn) should at least be partly motivated intrinsically. On the other hand, the organization of continuous development – supporting the *way* to learn – can also be challenging. Given the informal and implicit nature of individual professional learning (Tynjälä, 2008), as well as the

complexity of determining learning goals, Kremer-Hayon and Tillema (1999) advocated that many student teachers believe learning cannot be regulated. This finding is supported by other studies on conceptions of learning in teacher education (Mutton, Burn, & Hagger, 2010). Summarizing, results from studies in this domain indicate that motivation, strategies and conceptions of learning are among the factors that influence continuous professional development.

Recent studies into the development of expertise across professional domains show that, just as with learning, motivation for and strategies of professional development differ between individuals (Sonnetag & Kleine, 2000; Van De Wiel, Szegedi, & Weggeman, 2004). Accordingly, researchers in various domains of research on expertise have argued that continuous development is primarily the result of individual *deliberate practice* (Ericsson, Krampe, & Tesch-Römer, 1993). This is defined as *prolonged engagement in practice that is specifically designed and intended to improve individual performance*. Often four characteristics of deliberate practice are discerned, namely that the practice is *optimally suited* to enhance performance (i.e. within a zone of proximal development), should be *repeated*, and coupled with immediate, informative *feedback* while requiring significant *motivation* (Ericsson, 1998). In other words, to become an expert one does not just work or undergo experiences, but deliberately shapes these experiences. In dealing with the issue of continuous professional learning, deliberate practice could be a powerful approach (Van De Wiel et al., 2004).

The idea behind deliberate practice differs from self-regulated and self-directed learning (Zimmerman, 2006) in that its strategies and objective derive from optimizing performance, a key characteristic of professional learning (Tynjälä, 2008). This also makes it more suitable for fostering professional learning, and hence teacher learning. Deliberate practice in teaching has rarely been studied, whereas research has illustrated the unique nature of teaching expertise (Kreber, 2002). Based on a study in the USA, Dunn and Shriner (1999) concluded that deliberate practice in teaching entailed daily practice in terms of regular classroom preparation and evaluation, intended primarily to increase pupil learning. They postulated that “the frequent and mindful engagement in these activities may be what counts for expertise” (p. 631), or in other words the deliberation and regulation of these teaching activities. This perspective on deliberate practice for teachers is supported by other studies in Europe (e.g., Sonnetag & Kleine, 2000) who found that it is not so much the practice activities per se but the approach to the activities that makes the practice deliberate. The unique nature of the profession calls for a further exploration of what deliberate practice entails for the teaching. Moreover, after establishing how deliberate practice can be understood in the context of learning to teach, the question becomes how teachers can learn to practice deliberately and how teacher education can support them in that process.

There is a significant amount of research proclaiming what teachers should do and think, but little research on how this can be stimulated by teacher education (Brouwer & Korthagen, 2005). A review of research on altering the nature of student learning in higher education showed that students’ learning can be influenced by the learning environment, but that students’ perception of that environment and individual characteristics also play an important role (Baeten et al., 2010). The few studies that studied this

issue in the context of teacher education pointed to the factors of the learning environment that significantly influence the learning approach adopted, such as perceived work load, pedagogies used, lecturer enthusiasm and, most notably, assessment practices (Donche & Van Petegem, 2009; Gordon & Debus, 2002). Although these studies show that learning approaches are influenced by the learning context, they also indicate that there is no clear-cut solution to how to design a learning environment. Moreover, a large part of teacher education is situated in schools. Studies on the influence of the school, in terms of a learning environment, on teacher learning indicate that idiosyncratic and contextual factors interact in a complex way (Kwakman, 2003).

Summarizing, different schools of thought offer promising teacher learning concepts such as meaning-oriented learning and deliberate practice, but exemplars on how to stimulate such learning in teacher education programs are currently not described in the literature. This does not automatically mean that teacher education programs do not pay attention to it or that such knowledge does not exist. Recent self-study research by teacher educators has shown that teacher educators' knowledge and expertise can contribute to the existing knowledge base in innovative ways (Loughran, 2007). If knowledge about and practical examples of meaning-oriented learning and deliberate practice in teacher education programs exists, it is most likely to be found in/with expert teacher educators, as they are said to have up-to-date and rich, well-informed knowledge of the field (Berliner, 2001). Therefore, to increase our understanding of meaning-oriented learning and deliberate practice, as well as to explore ways in which these can be stimulated in teacher education programs, we sought to enrich the available literature by explicating expert teacher educators' knowledge in open, in-depth interviews. Our research questions are: (1) How can meaning-oriented learning and deliberate practice be defined in the context of learning to teach according to expert teacher educators? And (2) How can meaning-oriented learning and deliberate practice be stimulated in learning to teach according to expert teacher educators?

We seek to capture the essence of expert knowledge on fostering meaning-oriented learning and deliberate practice in *design principles*. These are heuristic statements about how and why a pedagogical intervention works in a certain context (Plomp & Nieveen, 2009) and are intended to be transparent and comprehensive, and to afford generalization to other contexts.

## **Methods**

### ***Context of our study***

There are different teacher education programs in the Netherlands, wherein this study is located. Programs that prepare for teaching primary education and the lower classes of secondary education are offered by professional universities. Normally, these are four year, comprehensive programs. The preparation track for teaching the higher classes of secondary education is offered by universities as a one-year post-graduate program, after completion of a subject specific master's degree. In contrast to primary school teacher education, all secondary school teacher education programs are subject-matter specific. All

programs include a large practicum component, culminating in the last semester being at least partly situated in secondary school practice. Hence, student teachers are taught by both institute supervisors as well as school-based mentors, both being regarded as teacher educators. Contrary to countries such as the United States, where teacher educators complete doctoral studies at universities in curriculum and instruction studies or related areas, in the Netherlands teacher educators are often experienced and accomplished teachers in a specific subject (Hamilton & Clandinin, 2011).

### *Participants*

Defining expert teachers has been the topic of recent debates and researchers have debated and struggled to define and measure teacher expertise (e.g., Palmer et al, 2005). Given the purpose of our study, we defined teacher educator expertise by the two criteria mentioned in the review by Palmer and colleagues (2005) and purposefully selected (Guest, Bunce, & Johnson, 2006; Onwuegbuzie & Leech, 2007) expert teacher educators accordingly. Following Palmer et al.'s first criterion, we sought experts with at least ten years of experience as a teacher educator, as this length of experience is generally considered a prerequisite for expertise (Ericsson, 1996). Second, since Palmer et al. indicated that expertise is context-specific (Berliner, 2001), we aimed to select teacher educators according to their recognized expertise by peers and superiors (Dunn & Shriner, 1999). Participants needed to be considered outstanding by at least two of their co-workers at their teacher education institute. As teacher education programs differ to a large extent in both substantive and structural characteristics, we confined our study to experts of one type of teacher education program, namely the one-year postgraduate teaching education program, and only included institute supervisors of these programs. To do justice to the differences that may exist between the different programs of this type, we included experts from the six teacher education institutes that offer this program. In addition to Palmer et al.'s criteria, we included only experts that were active teacher educators at the time of the interview, since we were looking for up-to-date expertise, assuming that this would represent innovative knowledge and up-to-date practical examples.

Fourteen expert teacher educators were identified and invited for an interview. Two experts declined the invitation owing to time constraints and illness. Twelve expert teacher educators agreed to an open, in-depth interview about student teacher learning and development. Despite careful selection, one teacher educator aborted the interview prematurely because he considered his knowledge insufficient. Average years of experience of the remaining eleven experts numbered fifteen years ( $SD = 8,1$ ). Since the experts were selected because of their supposed knowledge (Onwuegbuzie & Leech, 2007), we regarded them as informants (i.e. sources of knowledge) and not as representatives of the entire population of teacher educators (Lichtman, 2006). In such cases of purposeful, non-probabilistic sampling, a sample of twelve is considered adequate to reach conceptual saturation (G. Guest et al., 2006).

### *Interviews*

Interviews were based on an open interview scheme following a qualitative tradition. This was done to do justice to the complexity of the topic as well as to the nature of encapsulated expert knowledge (Berliner,

2001), since open interviewing allows the informants to answer from their own frame of reference (Bogdan & Biklen, 2003). Open interviewing also allows complex issues to be dealt with (Lichtman, 2006). Four pilot interviews had indicated that expert teacher educators indeed respond with more detail and complexity when interviewed in a more open way.

All interviews started with an introduction to the topic, including the operational definitions of meaning-oriented learning and deliberate practice. Experts were asked to respond to this introduction with a so-called “grand tour question” (Lichtman, 2006), intended to open up the conversation. This broad question (i.e. “Can you tell me what *you* perceive these ways of learning to look like in practice?”) was intended to explore the experts’ conceptual understanding of the two ways of learning.

Subsequently, interviews revolved around defining ways to stimulate meaning-oriented learning and deliberate practice. The interview approach was slightly different for the two ways of learning, as meaning-oriented learning is a better known concept than deliberate practice. Prominent and returning questions the interviewer asked to explore experts’ understanding of meaning-oriented learning were: How can you stimulate student teachers to look for understanding of teaching practice? How can you stimulate student teachers to use different sources, including theory? Which aspects of the learning environment – at the institute and at school – play a role in this process? Prominent and returning questions used to explore the more unfamiliar concept of deliberate practice were: do you recognize that some student teachers learn more from practice than others? What do these student teachers do? How can you support student teachers to learn most from practice?

The first author conducted all interviews. The interviews were conducted at the respective teacher education institutes where the experts worked and lasted about one hour. They were audio taped and transcribed verbatim.

### *Analysis*

Given the exploratory nature of our research aim grounded theory methodology was used to analyze the data (Bogdan & Biklen, 2003). A pervasive analysis technique in this respect is to use increasingly complex comparisons to delineate categories in the data and connect them (Boeije, 2002). To that end, each interview was summarized in a matrix: a “crossing of two or more main dimensions or variables to see how they interact” (Miles & Huberman, 1994). In our case, the matrices contained a synopsis per interview of *what* the expert understood meaning-oriented learning and deliberate practice to be and *how* the two concepts could be stimulated according to the expert understanding. This is comparable to the what/how grid used by other authors in content analysis of interviews (Hagger et al., 2008; Mutton et al., 2010). Interview statements that were not relevant to our research questions were not included in the matrices. These were mostly statements that concerned the, often negative, perceived effects of how a society organizes its education, what schools should do to organize experienced teacher learning, mostly in terms of teacher communities, and anecdotes of own teaching experience.

The subsequent comparisons focused on identifying experts’ shared understanding, that is, ways of fostering meaning-oriented learning and deliberate practice shared by at least half of the experts and

contested by none. This was done by systematically comparing the different matrices and using the experts' definitions of the learning approaches as a frame of reference (Boeije, 2002). From these analyses, different understandings of meaning-oriented learning and deliberate practice emerged, as well as the existing shared understandings of ways of fostering them.

The shared understandings of how to stimulate meaning-oriented learning and deliberate practice were transformed into design principles with the structure described by Denyer, Tranfield, and van Aken (2008). They advocated that design principles should specify the *context* to which they apply, the *intervention* proposed, and the *mechanism* by which the desired *outcome* is achieved: CIMO-logic. This separation between context (structural characteristics of the educational program) and intervention (what teacher educators do), often not explicitly made (Joseph, 2004), acknowledges design principles' context dependency. Moreover, specifying the mechanisms helps to understand how and why interventions work, moving beyond a black box description. This inclusion of context and mechanisms is why the CIMO-logic is preferred over other ways of specifying design principles that exist in the literature, that are often limited to a specification of intervention and outcome (Zitter, Bruijn, Simons, & ten Cate, 2012).

To insure quality in all of the steps described, an audit trail was created (Akkerman, Admiraal, Brekelmans, & Oost, 2008). In this trail the first author identified all steps of data gathering and analysis accompanied by theoretical justification for the decisions made. An independent researcher conducted a formative audit. Her report on the strengths and limitations of the study served as a starting point for the analysis description in the current section to realize transparency, as well as for issues that needed to be singled out as limitations in the conclusion section.

## Results

### *Conceptual understandings*

#### *Meaning-oriented learning*

Meaning-oriented learning was defined in a similar way by all the experts: "Learning for more than the immediate teaching context" or "going beyond 'what works'" represent their perspective. According to them, such learning entails critically analyzing teaching, based on a developing personal theory of practice while at the same time working on this theory. This analysis of teaching should focus on understanding. As expert 2 put it:

"Distancing yourself from teaching and engaging with your teaching analytically. A helicopter view. Being able to identify problems in teaching practice and analyzing them based on what you know to be useful theories."

This learning approach could manifest itself in different ways, all focusing on making teaching practice meaningful for the individual student teachers. Meaning-oriented student teachers were said to look beyond their own preconceptions and actively seek other perspectives on teaching. Theory is seen as one of the more important perspectives meaning-oriented student teachers take into account, but practical

theories of teacher educators and other teachers are also considered important perspectives. Making sense of these perspectives and integrating them into a personal theory of practice was considered the cornerstone of meaning-oriented learning.

### *Deliberate practice*

The experts understood deliberate practice in two distinct ways, resulting from the fact that the core of teaching lies in the learning of others: the pupils. Two experts explicated this duality:

“On the one hand, arranging that *you* [as a student teacher] learn from your work, while on the other hand organizing your instruction in such a way that it is educative [for your pupils].” (expert 2)

“The new thing here is, that you are not just looking at what makes the pupils learn. That should always be the case of course. But the other way around, you should also be aware of: how will *I* learn from this?” (expert 6)

The distinction between the two conceptualizations of deliberate practice lies in the *objective* of deliberation being teaching or teacher learning. The first, deliberating and practicing *teaching* can best be characterized as an *enactment conceptualization of deliberate practice*: the ability of the student teacher to put his or her intentions – based on an explicit theory of practice – into action to benefit pupil learning. Experts described this in different ways, ranging from “turning what you have learned into productivity” to “contextual knowledge. Knowing, what you do, why, in which situation.”

A crucial element in this understanding of deliberate practice is student teachers’ teaching performance. Consequently, seeking and using performance feedback is considered to be a crucial element in this conceptualization of deliberate practice. Five experts discussed deliberate practice in this way.

The second understanding of deliberate practice, to which the six remaining experts adhered, was in terms of *teacher learning*: the ability of the student teacher to seek or create optimally educative practical experiences. This can be considered a *regulation conceptualization of deliberate practice*. Expert 2, who also acknowledged the enactment conception, described it as:

“The intention you [as student teacher] should have, is to always aim for development. Subsequently you should know in which way you can steer your own learning. That is by asking the right learning questions, based on an analysis of yourself in a particular context. And by influencing your context so it affords, among other things, your learning.”

According to the experts, this understanding of deliberate practice for student teachers entails making their teaching practicum more educative. This includes reflection on one’s own learning process and current abilities, taking pleasure in seeking small personal challenges or experiments and findings ways to develop into the teacher you wish to become. Taking into account and capitalizing on what the teaching context affords was also considered part of deliberate practice for teaching. As teaching comes with responsibilities for pupils, not every type of practice is possible or even desirable.

### ***Fostering meaning-oriented learning and deliberate practice***

All experts considered these approaches to learning and its regulation worth pursuing, although they did mention some provisions. First of all, the immediateness of teaching is considered a real challenge. Expert 9 described this in terms of student teachers' motivation and concerns:

“Understanding why something would work is great, except for the fact that you have lessons to give *tomorrow* and you have no clue what to do.”

The deliberation of teaching practice in both conceptualizations was considered a higher level of learning by the experts, for which not only basic teaching competence but also time and energy are required. Hence, before meaning-oriented learning and deliberate practice can be fostered, teacher educators should equip student teachers with some basic teaching routines, which allow moving beyond their practical concerns.

Second, as all student teachers are different and develop differently, experts contend that there are no golden rules for what a teacher educator should do at a fixed point in the program. Expert 1 noted:

“In my experience, you need a different approach for every person. [...] Everyone needs a different incentive.”

Lastly, the experts argued that the structure of the teacher education programs is crucial in fostering both ways of learning. In the context of this study, this implied a program in which student teachers simultaneously attend classes at the teacher education institute while teaching subject classes at schools. This almost daily alternation of institute and school should enable student teachers to integrate theory and teaching. To afford deliberate practice, the teaching practicum should not be too demanding, leaving time and energy for learning and development. Ideally, practicum schools are schools that allow for experimentation with teaching methods, stimulate collegial discussion and, most importantly, provide a capable mentor or school supervisor who has been allotted time for supervision.

#### *Design principles for meaning-oriented learning*

*Challenge student teachers' assumptions.* To challenge the apprenticeship of observation, a first concern is making student teachers' implicit assumptions explicit and subsequently contesting them, inviting student teachers actively to consider and possibly revise their assumptions about teaching. This can be done by questioning ideas that are taken for granted and challenging student teachers to provide arguments for their own perspective. A strategy expert 1 often uses is:

“Just ask them why they start [a lesson] with homework revision. Why? They all do it, but without even considering another option.”

Such questions asked by the teacher educator should not be detached from the daily practice of the student teacher. Although profoundly different viewpoints may trigger contemplation, it limits the chances of student teachers learning to ask themselves similar questions.

*Decontextualize student teachers' practice.* All experts mentioned the importance of analyzing teaching, going beyond what happened, but also beyond what worked. An important element is looking for underlying principles or causes by posing why?- questions. Underlying principles can be discerned by having student teachers compare similar experiences, or by deducing essential aspects of a concrete experience using reflection techniques. These underlying principles can be applied across different situations fostering transfer. Expert 3 used the metaphor of an anchor to indicate that decontextualizations can be seen as acquisitions that should be held on to:

“Inventorying practices and then, trying to categorize with them. Link themes and labels to these practices. As a way of anchoring what they want to hold on to.”

Table 2.1. *Design principles to foster meaning-oriented learning: interventions, mechanisms and desired outcomes according to expert teacher educators*

Teacher educator intervention	Triggers the following mechanism(s)	Generating desired outcome(s)
Challenge student teachers' assumptions	Creates awareness of implicit assumptions	Invites student teachers to rethink assumptions
Decontextualize student teachers' practice	Identifies underlying patterns and causes in teaching	Enables transfer of gained knowledge to other teaching situations
Include diverging perspectives	Creates awareness of other perspectives on teaching	Invites student teachers to consider multiple perspectives on own teaching
Require student teachers to study pupil learning	Broadens attention from self to self and pupils	Understanding pupil learning allows for more thorough analysis of teaching
Model meaning-oriented learning	Shows strategies and benefits of meaning-oriented learning	Student teachers become prepared and/or motivated for meaning-oriented learning

*Include diverging perspectives.* Apart from theorizing their own teaching, student teachers should be confronted with other teaching practices and perspectives in order to understand their own better. As expert 5 put it, "Making the familiar strange, by making the strange familiar." Theory should be one of these other practices: a perspective that can help one understand one's own teaching or see different elements of one's own teaching. Next to theory, the opinions of other teachers, fellow student teachers and teacher educators can also be used. Expert 5 explained it thus:

“So I constantly try to perceive teaching from different perspectives, in which theory, the knowledge base, is a very important source. Not in the way of: it tells you how things should be done. But: if you look at it this way, does that shed light on this issue or not?”

Hence, the goal of including different perspectives can be attained by showing the complexity of teaching but also by showing the diversity of ways in which this complexity can be addressed. In this process, student teachers should learn to choose among these perspectives in line with their developing theory of practice.

*Require student teachers to study pupil learning.* Pupils and pupil learning are essential components of teaching, but not something to which student teachers automatically attend. The experts contended that in order to have student teachers include pupils in their frame of reference, the focus on pupil learning should run through the whole teacher education program. For instance, student teachers could be asked to take the pupils’ perspective and consider what it tells them about their assumptions and also their teaching. Also, in theorizing teaching practice, pupil learning outcomes should be the object of analysis; under what conditions do they learn best? Expert 8 described this:

“Learn to get inside their heads: what do they see when they look at you? Not just reflecting on yourself, but examining the effect of your behavior on your pupils.”

*Model meaning-oriented learning.* As meaning-oriented learning is different in learning to teach than in academic learning, student teachers need to learn how to do it. Modeling the desired learning to teach, for instance by showing how a certain theoretical perspective informs teaching, can help student teachers do that. Expert 5 observed that this is a strategy he often uses:

“The only thing I can do is explain how it works, show how it works, by doing it, really doing it together with them.”

In this process, both the strategies and benefits of meaning-oriented learning should be addressed. Table 2.1 summarizes the design principles for fostering meaning-oriented learning which specify intervention, mechanisms and outcomes (Denyer et al., 2008) in the context described.

#### *Design principles for the enactment conceptualization of deliberate practice*

*Work from student teachers’ explicated theories of practice.* Since enactment was defined as acting on intentions, attention should be directed towards student teachers making their developing frame of reference explicit. When explicated, these intentions can be used as a starting-point for the design, for instance, of lessons plans, but also as evaluation standards. The importance of having such personal, yet professional, standards in a society with many divergent perspectives on education is of vital importance, according to the experts. One way of achieving this, the experts said, was by asking student teachers to report their learning gains at an institute meeting. A related strategy was inviting them to verbalize their understandings of analysis of teaching in terms of practice rules. It should be noted that both strategies

served the dual purpose of anchoring what had been learned – related to decontextualizing teaching practice – as well as explicating the intentions on which future teaching could be modeled and evaluated.

*Promote anticipatory reflection.* After decontextualizing teaching experiences that have already taken place, student teachers should also be asked to think about future teaching. In this process student teachers learn to anticipate teaching, taking into account their own abilities and classroom affordance. This should go beyond simply stating what the lesson will look like. As expert 6 summarizes it:

“So, it boils down to moving from this intention someone has to the specific situation in which he has to perform, leaving the abstractions behind. So, not: how will you do that? But: how do you plan to do that with this class next week? How will you manage? And what could prevent you doing that successfully?”

In this process student teachers learn:

“...to make choices. And they learn to make choices that fit with them, personally and professionally, as well as being effective.” (expert 4)

Table 2.2. *Design principles to foster the enactment conception of deliberate practice: Interventions, mechanisms and desired outcomes according to expert teacher educators*

Teacher educator intervention	Triggers the following mechanism(s)	Generating desired outcome(s)
Explicate student teachers' theories of practice	Ascertains student teachers' own standards to design and evaluate performance	Allows student teachers to evaluate own performance with meaningful criteria
Promote anticipatory reflection	Student teachers learn to anticipate teaching	Student teachers learn to design teaching that is personally and contextually effective
Require student teachers to draw on pupils for feedback	Student teachers learn to appreciate and evaluate pupil feedback	Student teachers use feedback to evaluate their performance
Explicate teacher education pedagogy	Show student teachers the contemplation that precedes action	Student teachers link their perception of teacher educator teaching with teacher educator rationale

*Require student teachers to draw on pupils as feedback.* As stated before, ideally student teachers' considerations should include pupil learning. Therefore, in evaluating teaching performance pupils can be a rich source of feedback, and at times the only source, as teacher educators are not always present. Student teachers should be stimulated to collect data, in a natural format, on the learning of their pupils.

“Pupils are the prime source of information. And you don't need a questionnaire for that.” (expert 9)

Apart from an evaluation of student teachers' performance, the examination of pupils' work can also give rise to increased understanding of teaching, as discussed previously. Since, however, pupil feedback is not

unambiguous and sometimes is even unintentional, student teachers need to learn how to interpret it. Teacher education should aid them with that, as expert 4 noted: “the real issue is having student teachers evaluate themselves autonomously”.

*Explicate teacher education pedagogies.* The experts broadened the definition of the modeling of teaching to include the explication of pedagogies employed:

“I explicate what just happened in our [teacher education] meeting and ask them: Why did I do this? What did I ask *you* to do? So, I show them that I am not just going about my business. I really demonstrate that.” (expert 1)

This explication gives student teachers insight into the reasoning behind the teaching they perceive. Expert 11 noted that “in this process student teachers learn to see how much thought goes into action.” The effect of this explication of pedagogy is even stronger when the link to student teachers’ teaching practice is explicitly made:

“What do you think...how do you feel when none of your pupils has done his homework?” (expert 5).

The design principles for the enactment conceptualization of deliberate practice are summarized in Table 2.2.

*Design principles for the regulation conception of deliberate practice*

*Teach about learning to teach.* Experts claimed that they should explicitly provide student teachers general knowledge about teacher learning, phases in teacher development, and daily teaching challenges to make student teachers aware of what learning to teach encompasses. If possible, student teachers should be made aware of their personal learning conceptions and strategies (e.g., “When do you learn?”, “what does your practice school enable you to learn?”) and be challenged to experiment with other strategies. Learning about different ways of learning as a teacher is important as it enables student teachers to become aware of their own agency in their learning process.

Table 3.3. *Design principles to foster the regulation conception of deliberate practice: interventions, mechanisms and desired outcomes according to the expert teacher educators*

Teacher educator intervention	Triggers the following mechanism(s)	Generating desired outcome(s)
Teach about learning to teach	Student teachers develop understanding of process of learning to teach	Student teachers become aware of own development and ways to influence it
Support creation of powerful learning context	Student teachers discover how to organize own learning	Student teachers take initiative in their own development
Strive for realistic professional development	Student teachers experience success	Student teachers are motivated for further professional development

*Support student teachers' creation of powerful learning context.* An explicit theory of practice accompanied by knowledge of own abilities and possibilities of teacher learning allows student teachers to steer and organize their own learning. The experts contended that teacher educators can support this process in various respects. A first question to be posed to student teachers according to expert 4 is:

“What do you have to learn in order to become a professional? [...] Reflecting on the future: how you yourself can organize to accomplish something you currently cannot master.”

Learning about how teaching context can inhibit or promote their learning is also crucial here. Student teachers should be invited to capitalize on their teaching context to benefit their own learning.

“The last class on Friday is basically a ‘goner’ anyway. That allows student teachers to experiment with anything; it can only improve.” (expert 10)

*Strive for student teachers' realistic professional development.* As organizing their own learning basically challenges student teachers beyond their current abilities, it is important that these challenges are of an appropriate level. A crucial step in this respect is that student teachers learn about small, intermediate steps of working on their professional development. This focuses their attention and energy, as it is impossible always to be deliberate. Therefore, student teachers should be stimulated to be selective in organizing learning; they need to seek possibilities but also seek routines.

“I make them limit it to small steps. I tell them: we can't change everything. So let's start at step 1. Picture a class in which you are comfortable. Good. What will you do in this classroom to take a step in your own development? I do not care what it is: everything goes. But not all at the same time!” (expert 8)

The design principles for the regulation conception of deliberate practice can be found in Table 3.3

## Conclusion and discussion

### *Experts' conceptual understanding*

On the basis of the available literature we argued that fostering meaning-oriented learning and deliberate practice would be beneficial for student teachers, leading to richer and more integrated learning during the teacher education program while also affording successful continuous professional development after completion of the program. In terms of concrete learning activities and ways to foster these, however, there appeared to be a gap in the literature. We set out to explore these issues by interviewing expert teacher educators.

The first research question was how expert teacher educators define meaning-oriented learning and deliberate practice in the context of learning to teach. According to the experts meaning-oriented learning can be defined as: “learning to teach by developing an informed, personal theory of practice.” Deliberate practice can be defined as “deliberating teaching to enhance learning”. The experts' shared

understanding of meaning-oriented learning is comparable with that used in the literature (Bakkenes et al., 2010; Oosterheert & Vermunt, 2001), although the experts drew attention to the highly personal nature of the theory of practice to be developed, in accordance with recent literature on teacher professional identity (Akkerman & Meijer, 2011).

In contrast, experts understood the new concept of deliberate practice in two distinct but related, ways: enactment and regulation conceptions. These two understandings differ in terms of who is primarily learning: the student teacher or the pupil? According to the regulation conception, deliberate practice means shaping teaching to be educative for student teachers themselves. This is similar to the way deliberate practice is perceived in research on work settings in the sense that it involves regulation of learning and performance (Ericsson, 2004; Sonnentag & Kleine, 2000; Van De Wiel et al., 2004). Yet deliberate practice was also seen as shaping teaching to be educative for pupils; the enactment conception. This perspective on deliberate practice resembles what is described in the literature as enactment (Kennedy, 1999) or anticipatory reflection (Conway, 2001), namely shaping practice deliberately based on intentions. This latter conceptualization is more in line with the results of Dunn and Shriner (1999), who found that the conscious deliberation of normal teaching activities can be seen as deliberate practice. Instead of favoring one over the other, we postulate that they are both essential components of teacher learning and development and might even reinforce each other. Conversely, a dual focus on pupil and student teacher learning can make teacher education even more complicated, especially for student teachers.

The enactment conceptualization of deliberate practice appears to be closely related to meaning-oriented learning. Experts contended that meaning-oriented learning – and the resulting theory of practice – could be a starting-point, or even a prerequisite, for both conceptualizations of deliberate practice. Enacting a frame of reference, developed through meaning-oriented learning, was not, however, part of the existing definition of meaning-oriented learning, as it focused mainly on retrospective reflection (Oosterheert & Vermunt, 2001). Apparently, for the experts, meaning-oriented learning and deliberate practice are more related, and ways to stimulate them more integrated, than disparate theoretical schools reveal.

### *Design principles*

To answer our second research question, we questioned experts about ways to stimulate meaning-oriented learning and deliberate practice. Our results indicate that this can be done in different ways, according to the context and the intentions of the teacher educators. Using the CIMO structure (Denyer et al., 2008) this separation between context (structural characteristics of the educational program) and intervention (what teacher educators do) has been made explicit in the resulting design principles. As this way of representation details how and why an pedagogical intervention works in a certain context (Plomp & Nieveen, 2009), we aim to make them transparent and comprehensive, and to afford generalization to other contexts. The twelve design principles are specified in Tables 2.1, 2.2 and 2.3.

As a first step in discovering their potential, we compare the design principles with the available literature. The idea behind *challenging student teachers' assumptions* has been described in the literature before (Hammerness et al., 2005) in relation to the apprenticeship of observation and the knowledge base of teaching. Our results indicate that the objective of exposing initial beliefs should not be “undoing” misconceptions (i.e. knowledge), but instead stimulating critical thinking and thereby meaning-oriented learning.

Pedagogies described with *decontextualizing practice* resemble those often related to critical reflection (Mansveldt-Longayroux et al., 2007). Given the enormous amount of attention reflection has received the past years, a diversity of reflective practices has arisen, as well as diverse definitions. Our understanding of decontextualization, as opposed to some operationalizations of reflection, centers on the systematic analysis of teaching in an attempt to deduce theorized practical knowledge, applicable to a variety of situations. In terms of meaning-oriented learning, it is not so much the product or outcomes, but the process of decontextualizing that matters.

*Including diverse perspectives* has become a central aim of teacher education. Traditionally, these perspectives were worked out as theory and practice (Korthagen & Kessels, 1999). In the current study, a wider range of perspective is included, explicitly addressing the practical knowledge of teacher educators (see also for instance Zanting et al., 2001) and other teachers. The goal is for student teachers to experience that there is often not just one correct answer to a teaching problem, as it depends on the perspective adopted. Such an approach changes the role of theory from prescriptive to inspirational and the understanding of learning from finding out what works to finding out when something might work and why.

As Fuller's model of student teacher concerns is widely known and accepted (Conway & Clark, 2003), most teacher educators expect the *focus on pupil learning* gradually yet automatically to develop in student teachers. Our experts indicated, however, that there are ways in which teacher educators can steer that process and that this is essential in fostering meaning-oriented learning.

The literature on *teacher educator modeling* is expanding. From an initial focus on modeling teaching, other types of modeling have been explored in recent studies (e.g., Lunenberg, Korthagen, & Swennen, 2007). Our results strongly point to an approach to modeling that goes beyond modeling teaching. Modeling learning, preferably *modeling meaning-oriented learning*, can help student teachers learn the strategies and learning activities that belong to such an approach, while at the same time experiencing its benefits.

Awareness is often the goal of reflective pedagogies, yet it is crucial that student teachers *explicate* their theories of practice. Teaching does not have fixed performance standards that are applicable across the diversity of teaching practices. Given the variety in educational practices currently present in schools, teachers need to develop a theory of practice, preferably by means of meaning-oriented learning. To be able to work from and towards their beliefs, however, this theory of practice needs to be explicit.

Reflection is often interpreted as retrospection, in that we are used to reflecting on the past. Prospective or *anticipatory reflection* has recently been gaining attention (Conway, 2001; Endedijk, 2010).

Learning from teaching practice is often enhanced by focusing on reflection after teaching has been conducted. Yet, teaching can also be anticipated with learning or performance goals in mind. It is crucial that, just like retrospective reflection, anticipatory reflection should go beyond the planning of teaching and focus on why teaching should be done in a certain way.

*Pupil feedback on performance.* If teaching is viewed as a profession, it is geared towards work-goals which are often intangible (Tynjälä, 2008). Hence, it is difficult for student teachers to establish when they are doing a good job if they do not receive feedback. During teacher education it is common to receive feedback from university supervisors and mentor teachers. There are some recent studies (Cook-Sather, 2008) that explicitly include the pupil perspective in the discourse on education, although for different purposes than mentioned by the experts. We contend that learning to seek and use pupils as a source of feedback can be a way to secure feedback throughout the profession. As this feedback may not always be immediate, nor informative, student teachers should learn how to seek and evaluate such feedback.

*Explicating teacher education pedagogy* is also a broader conception of modeling than is normally considered in the literature. This conception relates to the actual teaching in the teacher education institute, but requires the explication of intentions behind the teaching (Russell & Loughran, 2007). In this process, enactment is made visible as the decisions made during teaching.

Even though teacher learning is vastly different from student learning (Tuomi-Gröhn & Engeström, 2003), in the literature there is little attention to *teaching student teachers about learning to teach*. In order to be able to organize and regulate their learning, however, it is crucial that student teachers learn to understand the differences between their own work-related learning and academic learning (i.e. studying). Such regulative knowledge can address a variety of issues, starting with what actually constitutes learning in learning to teach.

*Support for making teaching educative* is important, as most student teachers simply undergo teaching practice and do not deliberately shape it (Hagger et al., 2008), arguing that school characteristics determine the learning possibilities in teaching. Studies in workplace learning have shown, however, that teachers can have a large influence on what and how they learn while teaching (Kwakman, 2003; Williams, 2003). Key to this process is seeking and organizing educative experiences that suit personal and contextual affordances.

Lastly, we draw attention to supporting *realistic professional development* in student teachers. We feel it is important to stress this, as all the experts mentioned the challenging nature of the learning we aim to stimulate. Similarly, the deliberate practice literature emphasizes that an essential characteristic of deliberate practice is that it requires concentration. Therefore, the amount of deliberate practice should be confined (Ericsson et al., 1993).

In summary, the expert teacher educators' shared knowledge provides a highly integrated perspective on how to stimulate meaning-oriented learning and deliberate practice, combining ideas previously scattered throughout the literature. Some design principles tie in with what was already known. Although the pedagogies mentioned with these design principles may not be new, their connection to

meaning-oriented learning and deliberate practice is. Hence, our results indicate that pedagogies used commonly in teacher education programs also impact the nature of learning and may foster, or deter, from meaning-oriented learning and deliberate practice.

Other design principles challenge us to redefine key concepts in teacher education, as they broaden our conceptions of reflection, modeling and powerful learning environments. Reflection is broadened to include not only retrospection, but also anticipation of future teaching and learning opportunities. Teacher educator modeling is extended to include modeling learning, next to teaching. Powerful learning environments are seen as interplay of given circumstances and student teacher agency. We postulate that these broadened definitions should be seen as a starting point for future research and debate.

### ***Limitations***

Our analyses resulted in design principles. As these principles can be understood in different ways, we attempted to describe them as transparently as possible, using CIMO-logic (Denyer et al., 2008). Nonetheless, anticipated effects of their implementation are bound to be contextually influenced in more ways than can be described here. Since we conducted our interviews for a specific teacher education context, namely postgraduate programs, strongly rooted in secondary school practice, and with particular teacher educators (i.e. institute supervisors), the results can strictly only be generalized to similar contexts. Apart from this, design principles do not take into account personal student teacher characteristics nor the phase of development the student teachers are in, even though previous studies have shown that both influence learning (Grossman, 2005). Even so, we hope the generic nature of the principles invites teacher educators in different parts of the world to experiment with these principles in their own teaching.

Given our purpose and the complexity of the topic, we chose to conduct open-ended interviews, working from the experts' frame of reference, making interview comparisons more challenging. We have attempted to do justice to this by taking the experts' understanding of meaning-oriented learning and deliberate practice into account and listing the design principles according to their understanding of these concepts. Differences between the interviews, however, impede quantification of the results. Moreover, as expertise is hard to define, and even more difficult to measure, participant selection was not an easy task. Bias resulting from participant selection cannot be excluded. Although we purposefully selected the experts, also their number, to reach theoretical saturation (Guest et al., 2006), we cannot exclude that including more experts might have altered our results.

### ***Implications***

Some of our results raise more questions than they answer. For one, the twofold conceptualization of deliberate practice invites further explorations. The focus on both pupil *and* teacher learning can be seen as a consequence of the nature of the teaching profession. It could also imply that in similar professions such as, for instance, clergy or clinical work the same twofold conceptualization is present. Indeed, studies have shown that preparatory education programs in these fields employ similar pedagogies for their

practicum (Grossman et al., 2009). However, in the literature on deliberate practice, mostly done in medicine, this twofold nature is currently not mentioned (Ericsson, 2004). It would be interesting to explore whether these conceptualizations also play a role and, if not, why this is the case.

Similarly, based on our results we could question if existing views of influencing the nature of students' learning do justice to the complex process of student *teachers'* learning. This complexity results from the fact that student teachers are also learning to learn, as this learning differs vastly from the studying they were used to before. Essentially, they are learning to teach while learning to learn and develop as a teacher. Current models of how learning environments and teaching influence the nature of learning (Baeten et al., 2010), do not take this added complexity into account. We think it would be worthwhile to explore how this complexity plays out, and how student teachers and teacher educators deal with it in their teaching.

The final implication we would like to point out involves research *and* teacher education practice. As paper designs always differ from those that are actually implemented (Plomp & Nieveen, 2009), we stress that further research should explore the implementation and evaluation of the design principles presented in this chapter. Implementing these principles will shed light on their real potential. The current study has shown the significance of using (expert) teacher educators as informants, as their knowledge is both integrated and innovative. Consequently, we argue that in further developing these design principles, teacher educators should play an important role as well.



## Chapter 3 Exploring deliberate practice in teacher education<sup>3</sup>

### Abstract

This chapter sets out to explore in what ways student teachers' learning activities in a dual teacher education program can be characterized as deliberate practice, as deliberate practice is increasingly recognized as necessary for professional development. Based on an in-depth exploration of 574 learning activities, our results highlight the different ways in which activities in dual teacher education programs can be designed, the different motivations students have to engage in it repetitively, and different ways in which feedback can be organized, within contextual constraints posed by all professional environments. Results also indicate that self-improvement is not the only motivation for engaging in deliberate practice for student teachers, as pupil improvement is also considered important. These results support a context-specific operationalization of deliberate practice and provide starting points for dual teacher education programs to promote deliberate practice in their curriculum.

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<sup>3</sup> This chapter is based on Bronkhorst, L. H., Meijer, P. C., Koster, B., & Vermunt, J. D. (accepted). Deliberate practice in teacher education. *European Journal of Teacher Education*. doi: 10.1080/02619768.2013.825242

## Introduction

In contemporary society all teachers are expected to continuously learn and develop during their professional careers (Fairbanks et al., 2010). Recent insights from research on expert performance conducted in various domains indicate that deliberate efforts at developing expertise are necessary for expertise development throughout a professional career (Ericsson, 2006). Ericsson and colleagues (1993) coined the term *deliberate practice* to describe the prolonged engagement in practice that is specifically designed and intended to improve individual performance, even when a comfortable level of performance has already been reached.

As the responsibility for promoting continuous professional learning partly lies with educational programs that prepare their students for this inherent characteristic of professionalism (Bolhuis, 2006), there have been calls to stimulate deliberate practice during teacher education programs (e.g., Bronkhorst, Meijer, Koster, & Vermunt, 2011; Lehman & Ericsson, 1997). However, previous research has suggested that deliberate practice can be qualitatively different for different professions. This study delves into the unique characteristics of deliberate practice activities of students in a *dual* teacher education program (i.e., a program that organizes classes at university and teaching internships in schools concurrently), describing the different ways in which deliberate practice can manifest itself, but also how deliberate practice differs from other learning activities in which students engage. By doing so, we hope to provide practical suggestions that dual teacher education programs can use to promote deliberate practice, but that will also yield theoretical insights into the concept of deliberate practice, when applied to learning and developing as a teacher.

### *Deliberate Practice*

Early research on deliberate practice showed consistently that for expertise development beyond arrested development deliberate practice is necessary. This contradicted the innate abilities explanation of expertise development (Ericsson, 2006). Generally, researchers define deliberate practice by four characteristics.

A first characteristic is that the practice should be *designed* for self-improvement. Ericsson, Krampe, and Tesch-Römer (1993) describe this design as the engagement in appropriate but challenging exercises and the proper sequencing of these exercises. Dunn and Shriner (1999) also stress that deliberate practice is the result of effort and prior learning. Teachers, coaches, and trainers are expected to support learners in setting a challenging task (Ericsson, Roring, & Nandagopal, 2007).

A second characteristic is that the practice should be *repeated* to enable successive refinement (van Gog, Ericsson, Rikers, & Paas, 2005). Many studies find a significant link between the amount of deliberate practice and the rate of expertise development (Dunn & Shriner, 1999). In spite of this, Lehman and Ericsson (1997) caution against practicing too much, as that might exceed attentional resources. Their findings are supported by several studies in the domain of learning sciences (cf. van Gog et al., 2005).

This designed, repetitive practice is only effective when coupled with the third characteristic; namely, that it should be followed by immediate, informative *feedback* (Ericsson, 2006; Ericsson, 2007). This feedback should be an immediate response to the practice, and be informative about the performance and different aspects that underlie it, enabling the learner to improve their performance. Often, a teacher or trainer is responsible for this feedback (van Gog et al., 2005).

The final characteristic of deliberate practice is that it requires significant effort and concentration, or *motivation*, as it is not inherently enjoyable (Ericsson et al., 1993). This seems to follow logically from the other three characteristics, yet different authors stress that engaging in deliberate practice requires more effort than engaging in other practice activities (e.g., Ericsson, 2004; Moulart, Verwijnen, Rikers, & Scherpbier, 2004).

When combined, these four characteristics constitute deliberate practice. Some authors mention the similarity between the concept of deliberate practice and self-regulated and self-directed learning (Endedijk et al., 2012; Van De Wiel et al., 2004). Van de Wiel, Van den Bossche, Janssen and Jossberger (2011) note that professional activities identified as deliberate practice in studies conducted in the workplace often have characteristics that are similar to the key aspects of self-regulated and self-directed learning and mention “preparation, mental simulation, asking for feedback or advice, evaluation, reflection and updating activities” (p. 83). Zimmerman (2006) discusses the similarities between self-regulation and deliberate practice more extensively. He discusses how properties of deliberate practice, including task analysis, goal setting, strategy choice, self-monitoring, self-evaluations and adaptations have also been studied as key components of self-regulation. As such, what these concepts share is the importance they assign to the “regulation” or “deliberateness” of a learner’s activities.

However, these concepts tend to focus on different outcomes, as can already be deduced from the second part (i.e., “learning” and “practice”). Self-regulated and self-directed learning focus on (mental) activities culminating in knowledge development. In contrast, deliberate practice is studied mostly outside the domain of education and focusses on practice activities leading to increased performance. This difference in outcomes has been singled out as a characteristic difference between school and professional learning perspectives (Tynjälä, 2008). In recognizing the implications of such a difference, different authors in the domain of teacher education have advocated concentrating more on practice instead of knowledge (Fairbanks et al., 2010; Grossman et al., 2009). Therefore, we perceive deliberate practice to be a more appropriate concept to examine and promote student teachers’ learning and development in dual teacher education programs.

### ***Deliberate Practice for Professionals***

After initial studies in chess, sports, and music, researchers have explored deliberate practice in professions as well. These studies conclude that deliberate practice also plays an important role in professional expertise development (Sonntag & Kleine, 2000; Van De Wiel, Van den Bossche, Janssen, & Jossberger, 2011), as different comparative studies have shown that deliberate practice distinguishes precisely between expert and experienced professionals, controlling for other relevant factors (Ericsson,

2006). Until now, deliberate practice has only been studied in a few professional domains. Best known in this respect is medicine (Ericsson, 2007; Van De Wiel et al., 2011), but studies have been conducted in other domains as well, for instance insurance (Sonnentag & Kleine, 2000). Based on these studies, one can conclude that the nature of the deliberate practice activities is very much tied to the nature of the profession, as the activities that constitute the deliberate practice differ across professions. As such, Van de Wiel and colleagues (Van De Wiel et al., 2011) argued that it is not so much the practice activities per se but the approach to the activities that defines professional deliberate practice.

Notably in teaching - a profession concerned with learning and development - there has been little attention thus far to deliberate practice. Dunn and Shriner (1999) analyzed daily teacher activities of expert and experienced teachers and found that deliberate practice also accounts for teaching expertise. Yet, their data showed that deliberate practice in teaching entailed everyday activities in terms of regular classroom preparation and evaluation, intended primarily to increase pupil learning. They postulated that “the frequent and mindful engagement in these activities may be what counts for expertise” (p. 631), or in other words the deliberation and regulation of regular teaching activities.

Based on interviews with expert teacher educators, Bronkhorst and colleagues (2011) concluded that deliberate practice in teaching can be conceptualized as deliberated activities intended for self-improvement, but also intended to foster pupil learning and development. As such, they distinguished between an enactment conceptualization of deliberate practice, intended for pupil learning and a regulatory conceptualization of deliberate practice, intended for self-improvement. A study by Van de Wiel and colleagues (2011) corroborates this finding with physicians, for whom patient care was a primary trigger for engaging in deliberate practice, as well as self-improvement. Hence, for professional deliberate practice there may be more reasons to engage in deliberate practice, alongside the desire for self-improvement.

### ***Deliberate Practice in Teacher Education Programs***

As expertise is supposed to be the result of prolonged deliberate practice (Ericsson et al., 2007), one could assume that the onset of deliberate practice occurs early in an individual’s career or perhaps even during education. Different studies have found that students’ study methods, which are consistent with deliberate practice, are indeed significant predictors of study achievement (Moulaert et al., 2004; Plant, Ericsson, Hill, & Asberg, 2005). As far as teacher education goes, a study into a dual teacher education program in England confirms that there are differences in the “deliberateness” of student teachers’ teaching (Hagger et al., 2008). Although all student teachers learn from the experience they gain in their teaching internship, they differ in certain key respects, which are in line with the deliberate practice framework. Some students assumed that their experiences in their internship would automatically lead to professional learning. Similarly, they argued that the more lessons they taught, the better. In contrast, other student teachers were aware of the opportunities that teaching offered to experiment with or put their developing thinking and practices to the test. They were not satisfied with sufficient performance, but actively sought challenges and arranged feedback in creative ways, including seeking feedback from their pupils. Notably,

they searched for ways to put contextual constraints of school reality to their advantage and as such, contributed to creating a context that was conducive to their development.

In summary, it appears that for deliberate practice in teaching, it may be the approach taken to practice activities that determines “deliberateness”. This may include exploring the affordances of the context. Moreover, teachers might have other motivations, besides self-improvement, to engage in deliberate practice. It also appears that, for student teachers, deliberate practice is indeed practice that is designed, repeated, coupled with feedback, and motivated – in accordance with the current conceptualization of deliberate practice. Yet these characteristics can manifest themselves in different ways. In this chapter, we build on this research by examining in more detail the activities student teachers report to be meaningful in their professional development, in a dual teacher educational program. From now on we refer to these activities as *learning activities*. Using the four characteristics of deliberate practice as an organizational framework, we explore in-depth the different ways in which the deliberate practice characteristics become manifest. Subsequently, we compare deliberate practice and other learning activities, to further differentiate between them. Our main research question is: *What is the nature of deliberate practice for students in a dual teacher education program?* To answer this question, we explore two sub-questions: (1) In what ways are student teachers’ learning activities designed, repeated, coupled with feedback and motivated? (2) In what ways do deliberate practice activities differ from other learning activities that student teachers report to be meaningful in their professional development?

## Methods

### *Context*

The current study was conducted with one cohort of students of a one-year postgraduate teacher education program offered by a large university. This program leads to a subject-specific teaching license in the Netherlands that allows graduates to teach pupils at all levels of secondary education. Students can enroll in this program after completion of a subject-specific master’s degree, such as physics or history.

The general structure of this dual teacher education program is as follows. During the first semester, students are enrolled in two main courses at the institute, namely a general pedagogy and reflection class, and a subject-specific pedagogical content knowledge and pedagogy class. Next to that, the program offers various thematic master classes, which student teachers can follow voluntarily, to broaden and deepen their knowledge about teaching and learning. Simultaneously, the other half of the study load is spent in internships or at jobs in schools, rendering it to be a *dual* or school-based program. During this first semester, all students teach at least 20 hours at a secondary school. During the second semester, the institute part of the program remains roughly the same, although the number of meetings per class is somewhat reduced. Again, half of the study load is expected to be consumed by teaching, but the required number of hours taught increases to 100. Additionally, student teachers conduct a practice-

based research project at their schools. Assessment of teacher competence, as prescribed nationally by SBL (the Dutch Association for the Professional Quality of Teachers), is done using a portfolio.

### ***Participants***

Students for all subject matter tracks that the institute offers were invited to participate in this study. Sixty-three student teachers who were enrolled as full-time, regular students opted to participate, which represents a 78% response rate. Each subject matter track of the program was represented. As a group these student teachers reported 574 learning activities. The minimum number of learning activities reported by student teachers was 3, the maximum was 12.

### ***Instrument***

Most deliberate practice studies employ a comparative design in which self-reported daily activities of experts and experienced professionals are compared (Dunn & Shriner, 1999; Van De Wiel et al., 2004). This was not suitable for the current study, as we sought in-depth understanding of the characteristics of the learning activities of a specific group; namely, student teachers. Studies that explore deliberate practice without using a cross-sectional or between-groups design use different methods, such as a questionnaire (Moulaert et al., 2004), or an interview (Van De Wiel et al., 2011).

Although these methods of inquiry provide valuable insights, Endedijk (2010) argues that they tend to capture the intended or desired characteristics of learning activities and not so much the actual characteristics. She therefore suggests focusing on concrete activities, comparable to the daily activities reported in the comparative design studies. Following this line of reasoning, we chose to adapt a digital, structured learning log in this study that was designed by Endedijk and colleagues (2013) and was intended originally to measure student teachers' self-regulated learning in dual teacher education programs. Considering the similarity in the constructs of self-regulation in professional learning and deliberate practice described before, and the fact that it was designed specifically for the particular context of the study, we considered the structure provided by these logs to be a suitable starting point for our own study. To adapt the log for our current purposes, we only incorporated questions that also applied to deliberate practice. Moreover, we added some questions that focus specifically on the deliberate practice characteristics; for instance, concerning taking advantage of the contextual affordances.

The structure of the log was as follows. After an initial open question ("what did you learn?"), student teachers were asked several qualitative multiple-choice questions about the nature of this activity, enquiring about deliberate practice characteristics described previously. The multiple-choice answer categories were developed after thorough analysis of student teachers' responses to a completely open log by initial work by Endedijk and colleagues (2012) and subsequent research in using the structured log (Endedijk et al., 2013). To avoid forced choice, an "Other, namely" option was added to all relevant questions. Table 3.1 details the questions asked in the digital learning log and the corresponding deliberate practice characteristics from the literature. The answer options to these questions are listed in Tables 3.2 to 3.7.

### *Procedure*

Student teachers were asked to report six learning activities at the end of each semester, using this digital log. They were free to choose any activity they had found meaningful in their professional development. Yet, in order to capture the complete breadth of the educational program, student teachers were asked to report, at each measurement occasion, at least two activities that had occurred at the university, and two that had occurred at school. The remaining two reports were left open to the student teachers to determine the context. At the end of the first semester, 329 activities were reported; at the end of the second semester 245. Based on correspondence with student teachers about their participation, or lack thereof, we have reason to assume this drop in participation has to do with the increase in workload, to which the completion of the teacher education program gave rise, and not with the research itself.

Table 3.1. *Deliberate practice and other learning activity characteristics, corresponding questions in the digital log, and tables in which answers categories are reported (if applicable).*

<b>Deliberate practice characteristics</b>	<b>Question(s) in the log</b>	<b>Table</b>
Design		
Of the learning strategy	Why did you plan to learn in this way?	3.2
Of the learning context	Why did you plan to learn in this context?	3.3
Repetition/progressive refinement	How will you proceed with this learning activity?	3.4
Feedback	How have (/will) others notice(d) that you've learned this?	In text
Motivation	For what reason(s) did you plan or hope to learn this?	3.5
<b>Other characteristics of the learning activities</b>	<b>Question(s) in the log</b>	<b>Table</b>
Outcome	What did you learn?	3.7

### *Analysis*

Since there were different answer sequences or “routes” through the digital log, depending on the answers to previous questions, the different answers to the same questions were compiled into single variables. Subsequently, the answer options “Other, namely” of all variables were analyzed. In many cases, student teachers used this option to describe in their own words the content of one of the other answer options. When their answers described something different consistently - for instance, a different context of learning (e.g., at home or at a sports club) or a different learning strategy (e.g., a combination of different answer options) - we elaborate on this in the appropriate sections.

The first open question of the digital log (What did you learn?) was coded by two experienced coders, using the coding scheme developed by Endedijk and colleagues (2012), differentiating between

different learning outcomes. Inter-rater reliability of previous studies, using the same scheme by the same coders, was satisfactory (Cohen's Kappa = .81).

For our first research question, we explored the deliberate practice activities in-depth, examining the different ways in which the different deliberate practice characteristics manifest themselves. Subsequently, we identified the activities that encompassed all four deliberate practice characteristics, and defined these as deliberate practice activities. We compared the deliberate practice activities to the other learning activities using cross-tabulations (including chi-square tests for significance). We carried out post-hoc analyses to examine specific relations between cells in the tabulations. Following Field (2009), when the residuals are  $<-1.96$  or  $>1.96$ , indicating a difference of at least two standard deviations, we considered the difference between two qualitatively different cells to be statistically significant. When relevant, representative quotes from the digital learning logs, including those mentioned in the "Other, namely" option, were included in the text.

## **Results**

In this section, we elaborate first on the qualitatively different ways in which student teachers' learning activities in a dual program are designed, repeated, coupled with feedback, and motivated. Then, we move on to single out the activities that can be defined as deliberate practice, in order to compare them to other learning activities.

### ***Deliberate Practice Characterized***

#### *Design of the Activities*

In terms of the design of the activities, there was some deliberation concerning either the design of the learning strategy or the learning context in slightly more than half of the learning activities. When this was the case, the reported reasons for this design varied greatly. Table 3.2 details the frequencies and percentages of reported reasons for designing the learning strategy. The main reasons for learning activity design remain implicit or unconscious, including answers such as: "I only considered it afterwards". In contrast, the learning strategy was designed purposefully in only 12% of the reported activities (the 'deliberated choice' category). This is almost equal to the amount of activities in which students report that there is no other way to design or learn this, which can be seen as a contextual constraint. An example of a deliberated choice for the learning strategy is that of a student who used a validated questionnaire to enquire about his pupils' perceptions of him as a teacher:

"Because it enables you to check, in an objective way, if your suspicions are correct."

In only a very small number of reported learning activities the reason for design stated that others, such as teachers or trainers, had given the advice to do it in such a way.

Table 3.2. *Frequency and percentage of different reasons for designing the learning strategy*

Answer options	frequency	percentage
Not designed	265	46.2
I don't know	4	.7
There is no other strategy to learn this	64	11.1
I was advised externally	22	3.8
This is an efficient strategy	34	5.9
It was a deliberated choice	69	12.0
It was an implicit choice	106	18.5
Other, namely...	10	1.7
Total	574	100.0

N.B. Answer options are in response to the question: *Why did you plan to learn in this way?* “Other, namely” constitutes an open-ended answer category that student teachers could use to describe their reasons for designing their learning strategy in their own words.

Table 3.3. *Frequency and percentage of different reasons for designing the learning context*

Answer options	frequency	percentage
Not designed	266	46.3
I don't know	2	.3
It was offered by program this way	63	11.0
This can't be learned in another context	72	12.5
I was advised externally	6	1.0
Learning it in this context was easy or quick	17	3.0
It was a deliberated choice	53	9.2
It was an implicit choice	90	15.7
Other, namely...	5	.9
Total	574	100.0

N.B. Answer options are in response to the question: *Why did you plan to learn in this context?* “Other, namely” constitutes an open-ended answer category that student teachers could use to describe their reasons for designing their learning context in their own words.

Adding up the qualitatively different ways in which the learning activity could be designed, either in terms of purposeful design of the learning strategy or the learning context, 249 learning activities can be characterized as designed from our perspective on deliberate practice.

The other way in which professional learning activities can be designed in dual teacher education programs is by a purposeful handling of the affordances of the context, as detailed in Table 3.3. Again, an

implicit choice for the design of the learning context is most prominent, followed by two options that illustrate the affordances of the learning context: that it could not have been learned in a different context; or that it is offered by the program in this context. The conscious choice for a certain learning context is even less prominent than that of the way of learning; only 9.2% of the reported activities are designed in this way. An example of a conscious choice of the learning context is:

“I encountered this problem with this class. As the work ethic of this class in itself is good, it appeared to me that this would be a good class to institute classroom order in this way.”

#### *Repetition of the Activities*

To explore the potential repetition of practice, we asked about potential follow-up of this learning activity. The qualitatively different ways in which student teachers planned to repeat their activities is detailed in Table 3.4. Often, the planned repetition was, in fact, some sort of progressive refinement, either by improving what had been learned further or by applying it, which are the two largest answer categories. An example of an activity that a student sought to further improve is:

“To try to deal with it more consciously, as a result of which *I myself* will notice when it occurs.”  
[emphasis added]

Table 3.4. *Frequency and percentage of different plans for repeating the learning activity*

Answer options	frequency	percentage
I have no plans	57	9.9
I will try again	18	3.1
I have an action plan	27	4.7
I will continue doing it	53	9.2
I will improve it	165	28.7
I will apply it in teaching	143	24.9
I will try it in a different situation	30	5.2
I have a new learning goal	52	9.1
Other, namely ...	29	5.1
Total	574	100.0

N.B. Answer options are in response to the question: *How will you proceed with this learning activity?* “Other, namely” constitutes an open-ended answer category that student teachers could use to describe their plans for repeating the activity in their own words.

An example of application:

“I want to deepen my knowledge about how an excursion is organized. However, this is a long-term resolution, as I will only be able to apply it later on.”

In a relatively large number of activities the option “Other, namely” was selected. Unfortunately, in slightly less than half of these cases student teachers did not describe their alternative plans for repeating the learning activity. It remains unclear if this means that there were no new plans based on this activity or that the plans differed from the options described.

All in all, in 517 reported learning activities (about 90%) there was some sort of plan to refine the outcomes of the reported learning activity that is in line with the deliberate practice framework.

### *Feedback*

We examined the characteristic of feedback by enquiring about reactions to the learning by asking if the learning had been, or would be, noticed by others, as a prerequisite for feedback. The learning reported in the log would not be noticeable in 123 (21.4%) learning activities, would become noticeable in the future in 189 (32.9%) learning activities, and had already been noticed in 262 (45.6%) learning activities. Activities in this latter category had been coupled with immediate and informative feedback, as signals from the environment had been interpreted without delay as feedback to student teachers’ learning. Hence, 262 learning activities can be characterized as being coupled with feedback from our perspective on deliberate practice. Subsequently, we enquired how the learning was noticed. These responses show the diversity in what is considered feedback and more specifically, who is giving the feedback. Often, pupils are reported as being the source of feedback:

“Pupils are much more open towards me in the classroom and see me less as a ‘police officer’ and more as a teacher who pupils can talk to, but who can also correct their mistakes.”

In reporting on how learning was noticed, some of the answers include other deliberate practice characteristics, such as design, motivation, and potential repetition:

“I asserted in advance on which aspects I would like to improve, so they could really take that into account when observing me and possibly give me some suggestions. I noticed that these observations from my supervisor and fellow students really took into account my ‘weaknesses’ and also explicate when things are going well.”

### *Motivation*

Lastly, we enquired about the motivation for engaging in the learning activity. As can be seen in Table 3.5, student teachers reported different reasons. The reason most often mentioned is dissatisfaction with current abilities or previous activities. This dissatisfaction could be both with their own abilities, as with pupils’ performance. A student teacher describes this as follows:

“I saw that pupils were less motivated in their work than previously. By adjusting my lessons I would be able to change this.”

From a deliberate practice perspective, motivation should move beyond mere dissatisfaction with current abilities, as deliberate practice requires effort and concentration, even when there are no immediate problems. A different type of motivation that is reported is that there was a particularly good occasion or

opportunity for learning, which is selected in almost 9% of the reported activities. This can be seen as deliberate practice, in the sense of taking advantage of the contextual affordances. An example of such a motivation to learn is the following:

“This is always said in the books, and I had some trouble assuming a good posture in front of the class (especially first and fifth grades). I could practice this well in this situation.”

In general, student teachers’ motivation for learning appeared to be a combination of their own learning desires and needs and those of their pupils.

“Prior to teaching I was convinced that this was a good way of educating pupils (which I base on my own experiences in high school and on ideas of others around me). That is why I wanted to learn this.”

Excluding dissatisfaction with current abilities, 308 reported learning activities can be said to meet the characteristic of motivation from our perspective on deliberate practice.

Table 3.5. *Frequency and percentage of different motivations for learning activity*

Answer options	frequency	percentage
Not deliberated in advance	266	46.3
Unsatisfied with current abilities	67	11.7
To have the experience	27	4.7
Out of curiosity	32	5.6
I was advised externally	32	5.6
To prepare for future events	42	7.3
It was a good occasion/opportunity	50	8.7
It was part of the program	25	4.4
Other, namely...	33	5.7
Total	574	100.0

N.B. Answer options are in response to the question: *For what reason(s) did you plan or hope to learn this?* “Other, namely” constitutes an open-ended answer category that student teachers could use to describe their motivation in their own words.

### ***Deliberate Practice Compared***

We identified 63 learning activities from a total of 574 that meet *all* deliberate practice criteria. That is to say, these activities, to which we will refer as deliberate practice activities from now on, were at the same time purposefully designed, potentially repeated, open to feedback as well as motivated in some way.

Table 3.6 summarizes the number and percentages of learning activities that meet the separate deliberate practice characteristics.

Table 3.6. *Frequency and percentage of reported learning activities that meet individual deliberate practice characteristics*

Nature of activities	frequency	percentage
Purposefully designed	249	43.4
(Will be) repeated	517	90.1
Open for feedback	262	46.7
Motivated	308	53.7
Total	574	100.0

We compared the characteristics of these deliberate practice activities with the other learning activities that students reported. The learning strategies did not differ between deliberate practice and other learning activities ( $\chi^2(8) = 11.713, p = .164$ ). It appears that there are no special kinds of learning strategies that student teachers use that can be considered more prone to deliberate practice than others.

Table 3.7. *Frequency of outcome of learning compared between deliberate practice and other learning activities (other LA)*

Answer options	Type of learning activities		
	Deliberate practice	Other LA	Total
Rule of thumb	3	43	46
Factual knowledge	10	102	112
Procedural knowledge	7	68	75
Own learning or identity	7	112	119
Teaching performance	<b>22</b>	<b>77</b>	<b>99</b>
Theory of practice	10	95	105
No description of learning	4	14	18
Total	63	511	574

N.B. Answer options are in response to the question: *What did you learn?* 'No description of learning' was coded when the student teacher did not describe the outcome of his or her learning activity, only the activity itself. Answer options in **bold** differ significantly (i.e. residuals are  $< -1.96$  or  $> 1.96$ ).

This begs the question as to whether the outcome of the learning activities differs. Here, we see a difference between deliberate practice activities and other learning activities ( $\chi^2(6) = 20.15, p = < .01$ ). Post-hoc analyses revealed that deliberate practice activities resulted in significantly more performance outcomes (residuals = 3.4), as can be seen in Table 3.7. An illustrative example of a learning outcome in terms of (an increase in) teaching performance is:

'I have learned to postpone moving on with an explanation when it is not completely quiet. So, actually I've learned to wait when pupils do not become quiet immediately when I ask them to.'

In contrast, deliberate practice activities are reported less with outcomes that concern students' own learning and identity, even though the residuals of these cells are only -1.7 and therefore not significant.

As our study concerns deliberate practice in a dual education program, we also checked if we could find influences of the educational program. We compared the moment in which the activity had been reported, i.e. whether it was at the end of the first semester or at the end of the second semester. There did not appear to be difference ( $\chi^2(1) = .609, p = .435$ ). Next to that, we compared the context in which the learning had occurred, being either at the university or during the internship. The context of learning did not differ significantly for deliberate practice and other learning activities ( $\chi^2(3) = 4.981, p = .173$ ).

## **Conclusion and discussion**

We set out to explore the nature of students' deliberate practice in a dual teacher education program. To that end, we first explored the qualitatively different ways in which student teachers' learning activities in a dual program can be designed, repeated, coupled with feedback, and motivated. Based on this exploration, we were able to identify 63 learning activities that meet all four of these characteristics, and could therefore be characterized as deliberate practice. Subsequently, we compared these deliberate practice activities with other learning activities. We discuss our findings per sub-question.

### ***Deliberate Practice Characterized***

Our first sub-question is *in what ways are student teachers' learning activities designed, motivated, repeated, and coupled with feedback?* Learning activity *design* occurred in about half of the learning activities, and could focus on either learning strategy or the learning context, or both. Often the choice for design was implicit. Next to deliberated choices, students' responses also indicated that there are times when contextual constraints are in play. For instance, some things cannot be learned using a different strategy, or in a different context. Interestingly, students do not report relying on their program or educators for the design of their learning activities often. This contrasts with deliberate practice literature, where the role of the trainer, coach, or learning environment is often stressed (Lehman & Ericsson, 1997), especially in terms of the design of the activity (van Gog et al., 2005).

Plans for *repeating* the learning activity were often reported in terms of progressive refinement: applying what had been learned in different settings, or refining it in some other way. Only a small number of the learning activities did not have a planned follow-up. In contrast, only about half of the activities were, in fact, designed or in other words the result of such planned follow-up. It could be that students did not choose to report on such follow-up learning activities, as students were free in selecting which learning activity to report on. Yet, it could also be that plans for progressive refinement, although

made, are not easily achieved, owing to the complexity of everyday teaching practice that differs from day to day (Mutton, Hagger, & Burn, 2011). In future research, we hope to explore further the role of repetition in learning activities.

The characteristic of *feedback* was explored by inquiring about possible reactions to learning. Based on prior research (Hagger et al., 2008), we hypothesized that feedback can be any information that the student teacher interprets meaningfully in relation to their own performance. Our own results support this notion, as we found many sources of feedback, often including pupils' behavior. Some authors have stressed that pupils are an underused source of feedback in the design (Könings, Brand-Gruwel, & van Merriënboer, 2005) or evaluation of teaching (Cook-Sather, 2008; Cook-Sather, 2009). Our results indicate that pupils, the 'clients' of the teaching profession, can be powerful sources of immediate feedback, although students need to know how to interpret them, in order for the feedback to be informative.

Lastly, the *motivation* to engage in the learning activities was also highly diverse. Dissatisfaction with current abilities is reported most often. This can be explained in light of the phase of professional development these teachers are in, as research indicates that it generally takes some years to feel competent as a teacher (Berliner 2001). Strictly speaking, we feel this should not be considered as deliberate practice, since that focuses on extending performance even when a comfortable level of performance has been reached (e.g., Ericsson 2004). This kind of dissatisfaction suggests that this level of competence has not been reached, and that the activity is undertaken out of necessity. However, it could be that, for beginning professionals, dissatisfaction with current performance is a sign of developing or emerging deliberate practice, as for some student teachers this kind of motivation may be enduring no matter what level of competence they reach.

Moreover, motivation to engage in self-improvement is closely tied to reasons to foster pupil learning. In fact, even though student teachers selected these activities because they were meaningful in *their* professional development, increasing *pupil* learning was also found to be a prevalent motivation for designing learning activities. The fact that student teachers consider their pupils in designing their teaching is obvious, but that they also invoke increasing pupil learning as a reason for designing their own learning is unexpected from what is known about deliberate practice. This finding is, however, in line with earlier research on deliberate practice in this domain (Bronkhorst et al., 2011), and comparable with findings in other professional domains, where the needs of clients are the main motivation for professional learning (Van De Wiel et al., 2011). Interestingly in this respect, student teachers do not make this distinction between their own learning and their pupils learning, at least not explicitly.

### ***Deliberate Practice Compared***

Our second sub-question focused on *the ways in which deliberate practice differs from other learning activities that students report to be meaningful in their professional development*. The learning strategy did not differ between deliberate practice and other learning activities. All different learning strategies, such as analyzing, reflecting and experimenting, turned out to be candidates for deliberate practice. Similarly, we did not find a significant difference between the contexts in which deliberate practice activities took place. Hence, the

*purposefulness* of the design of either learning strategy or learning context was what made the learning activity deliberate, rather than the specific activity or context itself. This finding contrasts studies that have identified specific activities, such as solitary practice, as *the* deliberate practice for a specific field (cf. Ericsson et al., 1993). Our finding supports other studies on professional deliberate practice (Dunn & Shriner, 1999; Sonnentag & Kleine, 2000), that indicate that different sorts of professional activities can make up for deliberate practice, as it is the *approach* to those activities that defines the nature of deliberate practice.

In accordance with literature on professional learning (e.g., Tynjälä, 2008), the outcomes of the reported activities differed substantially. Thus, what student teachers consider meaningful for their professional development is highly diverse. Deliberate practice activities, however, turned out to result mostly in an increase in teaching performance, which is in line with the general assumption that deliberate practice leads to an increase in expert performance. It is also in line with recent publications on teacher education programs that stress that practicing teaching (skills) should play a more important role in teacher education (Fairbanks et al., 2010; Grossman et al., 2009). Yet, although deliberate practice is necessary for expertise development, our results indicate that other vitally important learning processes - for instance concerning identity development - are less likely to be realized with deliberate practice, whereas past research has indicated the importance of such learning outcomes for becoming a teacher (Rodgers & Scott, 2008). This finding invites us to understand deliberate practice as necessary, but not as sufficient for teacher development.

### ***Limitations***

This study used a different methodology to examine deliberate practice from other studies. Although appropriate for the purpose of this study, this approach has its limitations. For one, we cannot be sure the reported activities, characterized as deliberate practice, indeed lead to expertise development. Moreover, the activities are self-reported and observations might give different results.

Our instrument, the digital log, also has some limitations as it may have underrepresented the sequential nature of deliberate practice activities, by focusing on single learning *activities* instead of sequences. This approach impedes us from reaching a conclusion on the issue of repetition of learning activities. In further research, we propose to explore sequences of learning activities.

### ***Implications***

By illustrating the qualitatively different ways in which the different characteristics of deliberate practice can become manifest, our study provides starting points for dual teacher education programs, to promote deliberate practice in their curriculum. Our results imply that educational programs do not need to focus on identifying specific activities as deliberate practice. In contrast, the approach taken towards all kinds of activities appears to be more important, especially for dual programs, as this can imply that diversity across internships can be exploited by asking students critically consider affordances that different internships offer for learning (Bronkhorst et al., 2011). In contrast, across all contexts, it appears that

stimulating student teachers to explore possible alternative sources of feedback, including pupil learning, to foster their own learning is indispensable. Similarly, our results also indicate that in professional programs the motivation to engage in deliberate practice need not reside solely in the self-improvement of the students. Student teachers are also motivated to improve pupil learning and might, therefore, also be triggered by this focus.

In conclusion, this study has advanced a teacher education-specific understanding of deliberate practice. In proposing such an understanding, we aim to do justice to the complexity of teacher development, while at the same time retaining the strengths of the concept of deliberate practice. However, this may imply that the accepted definition of deliberate practice, which stresses repeated attempts at self-improvement in training environments designed specifically to foster individuals' performance, including ample feedback by a trainer, should be modified when applied to teaching. Based on our research, deliberate practice for student teachers in dual educational programs could be seen more as the continuous progressive refinement of core professional activities, that are intended to foster either the performance of the teacher or of the student, and which build on contextual affordances.



## Chapter 4 Intended unexpected findings: insights developed in formative intervention research<sup>4</sup>

### Abstract

Meaning-oriented learning (MOL) and deliberate practice (DP) can be seen as the crux of what it means to learn as a teacher, during teacher education and afterwards. To enrich the existing understanding on how teacher educators can foster MOL and DP in the context of their existing curricula, four teacher educators, who team-taught two central courses of a respected teacher education program, collaborated with a researcher-interventionist in developing, implementing and evaluating pedagogies in two parallel year-long formative interventions. Qualitative content analysis of preparatory and evaluation meetings, lesson plans and the researcher logbook pinpoint to the importance of engaging student teachers in second-order teaching, using “meta-questioning”. Our results also highlight the different ways in which the integral tension, that arises when student teachers’ preferences for learning do not (yet) match those of the teacher educators, can be managed.

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<sup>4</sup>This chapter is based on Bronkhorst, L. H., Koster, B., Meijer, P. C., de Kleijn, R. A. M. & Vermunt, J. D. (in preparation). Intended unexpected findings: insights developed in formative intervention research in teacher education.

## Introduction

“If teaching is indeed a complex practice, and not something that individuals will naturally develop on their own, then teacher educators must develop new approaches for preparing ordinary people, in an extraordinarily brief amount of time, to be prepared for the challenge.” (Grossman et al., 2009, p. 287)

Teacher education bears a dual responsibility (Russell & Loughran, 2007). Next to supporting its student teachers in developing the fundamentals of teaching during the brief intervention that teacher education comprises – a highly complex task in itself (Cochran-Smith & Zeichner, 2005) - it should also make sure that student teachers learn how to continue learning and developing throughout their career. This latter aspect is especially important, as past research has shown that some student teachers are better prepared for ongoing challenges of the profession than others (Brouwer & Korthagen, 2005), which in turn is likely to have implications for their students’ learning. Different schools of thought have explored this issue of continuous learning and development from different perspectives. Research on learning patterns points to the importance of *meaning-oriented learning* (Vermunt & Endedijk, 2011) as a way of learning that focusses on understanding teaching and learning, which is of crucial importance for effective teaching (cf. Darling-Hammond, 2006b). In line with recent pleas that understanding teaching does not suffice for continuous development (Fairbanks et al., 2010; Grossman et al., 2009), research on expertise development stresses the importance of deliberate efforts of practicing to continue to develop professionally, for which Ericsson and colleagues (1993) have coined the term *deliberate practice*.

In previous research we have argued that both meaning-oriented learning (MOL), focusing on the more conceptual processes of learning, and deliberate practice (DP) focusing on the more concrete processes of teaching, are important for developing teaching expertise (Bronkhorst et al., 2011) and can be considered complementary or enriching (Bronkhorst, Meijer, Koster, & Vermunt, accepted). In a previous study, we developed design principles specifying how teacher educators can work on fostering meaning-oriented learning and deliberate practice (Bronkhorst et al., 2011). These principles were grounded in the literature as well as in expert teacher educators’ practice, and were formulated in such a way that they could be applied in different teacher education settings. In this study we intend to develop these principles further, by studying how ways of fostering meaning-oriented learning and deliberate practice can be integrated validly in existing teacher education curricula. Agreeing that “development of knowledge of practice is important for teacher educators in order to improve the quality of teaching about teaching” (Berry, 2007, p. 130), in this chapter, we describe two parallel year-long formative interventions in different teacher education courses to enrich our existing understanding on the workings of this set of design principles in authentic teacher education practice.

### *Meaning-oriented learning*

Oosterheert and Vermunt (2001) studied differences in student teachers’ learning, inspired by research on student learning in higher education (recapitalized in, among others, Vermunt & Vermetten, 2004), and

extending research on teacher education that had indicated how student teachers differ in critical reflection (e.g., Kubler-Laboskey, 1993). As their studies coincided with the trend to allocate part of the teacher education program to schools (described by Zeichner, 2010), they explored how student teachers learn in teacher education programs in which about half of the curriculum takes shape in educational practice by field placements or internships, also known as *dual* teacher education programs (cf. Endedijk et al., 2012). Based on extensive interviews and questionnaires, Oosterheert and Vermunt distinguished three different orientations to learn how to teach – subsequently conceptualized as patterns (Vermunt & Endedijk, 2011); namely, survival-oriented learning, reproduction-oriented learning and meaning-oriented learning. Survival-oriented learning is characterized by the complete captivation of practice. Student teachers who adopt this learning pattern have little to no attention or appreciation for regulating their learning and do not appreciate the help others to do so. Reproduction-oriented learning is characterized by a more structured focus on improving teaching performance. However, these improvements are always sought within an existing frame of reference. In contrast, *meaning-oriented learning (MOL)* is characterized by an explicit focus on understanding underlying mechanisms that play a role in teaching, based on a variety of sources – including theories on learning and teaching - as a way to improve teaching practice (Endedijk & Vermunt, 2012). Meaning-oriented learning is similar to what is referred to as a deep approach to learning (Vermunt & Endedijk, 2011). In the literature on student (teacher) learning scholars express a preference for deep or meaning-oriented learning, based on conceptual as well as empirical studies (cf. Baeten et al., 2010).

Based on the literature and interviews with expert teacher educators (Bronkhorst et al., 2011), we came to understand MOL as a combination of looking beyond own preconceptions and actively seeking other perspectives on teaching practice and integrating these into a personal theory of practice. Therefore, we define MOL as *learning to teach by developing an informed, personal theory of practice*.

### ***Deliberate practice***

Increasingly, it is being recognized that learning, when understood as a mental process resulting in knowledge development, does not suffice in learning to teach (Fairbanks et al., 2010), as practice is necessary for (expertise) development. Studies in the United Kingdom have shown that student teachers differ significantly in how they approach learning in teaching practice (Hagger et al., 2008; Mutton et al., 2011), yet pedagogies addressing student teachers' approach to practice not been addressed extensively in research on teacher preparation (Grossman et al., 2009).

In the literature on professional development and expertise there is a growing attention to differences in how professionals approach improving their performance (e.g., Dunn & Shriner, 1999; Van De Wiel et al., 2004). In the early nineties, Ericsson and colleagues (1993) coined the term *deliberate practice (DP)* to describe the prolonged engagement in practice that is specifically designed and intended to improve individual performance, even when a comfortable level of performance has already been reached. Dunn and Shriner (1999) studied the differences between experienced and expert teachers and concluded

that the conscious deliberation of normal teaching activities, such as lesson preparation and evaluation, is what constitutes deliberate practice for teachers.

Interestingly, expert teacher educators differentiate between two distinct conceptualizations of deliberate practice for teaching (cf. Bronkhorst et al., 2011); an enactment and a regulation conceptualization. The *enactment conceptualization* focuses on the ability of student teachers to put their intentions – based on an explicit theory of practice and taking into account the context of the school in which they are teaching – into action to benefit pupil learning. The *regulation conceptualization* focuses on the ability of student teachers to seek or create optimally educative practice experiences for themselves, building the opportunities already offered by their schools. Indications of such a differentiation have also been found in another study on physicians' deliberate practice (Van De Wiel et al., 2011). Based on an analysis of 574 self-reported learning activities of student teachers (Bronkhorst, Meijer, Koster and Vermunt, accepted) we consequently concluded that deliberate practice in learning to teach can be understood as *the continuous progressive refinement of core professional activities, that are intended to foster either the performance of the teacher or of the student, and which build on contextual affordances.*

### ***Building on design principles to foster MOL and DP***

To discover how teacher educators can stimulate MOL and DP, we explicated expert teacher educators' knowledge on how to stimulate MOL and DP in a previous study (Bronkhorst et al., 2011). We recorded their expertise as *design principles*: heuristic statements about how and why an intervention works in a certain context (Plomp & Nieveen, 2009). The design principles were formulated in such a way, that they could be operationalized in different contexts, although there were intended for university-based dual teacher education programs. An adaptation of 12 design principles is recapitulated in Table 4.1 (for an elaborate description, we refer to Bronkhorst et al., 2011).

Even though we thus have empirically and conceptually grounded indications on how to foster MOL and DP, how this total set of design principles plays out within an existing curriculum, remains to be explored. This is the central aim of the present study.

We opted for a “formative intervention” (Engeström & Sannino, 2010; Engeström, 2011; Sannino & Sutter, 2011) to meet this aim, as the formative intervention approach meets the following criteria. First, in order to really understand the complex workings of the total set of design principles, they should be implemented in authentic teacher education practice and become embedded and appropriated in the objectives of a course. Second, we wanted our research approach to afford and stimulate teacher educators' engagement, as a previous study had shown the significance of using expert teacher educators as informants and we agree with Loughran and Berry (2005, p. 202) that “teacher educators must be at the forefront of developing insights into teaching about teaching”. Third, as we explicitly sought to enrich our understanding, the research design should not only allow, but actually promote realizing outcomes that we did not anticipate in advance (Teräs & Lasonen, 2013).

Table 4.1. *Design principles for fostering meaning-oriented learning (MOL) and deliberate practice (DP) in university-based, dual teacher education programs, adapted from Bronkhorst et al. (2011).*

In a university-based dual teacher education program, to stimulate....	University teacher educators should create a learning environment that...
Meaning-oriented learning	Challenges student teachers' (implicit) assumptions Decontextualizes student teachers' practice Includes diverging perspectives, including theory, as sources for understanding Studies pupil learning Models meaning-oriented learning
Deliberate practice (enactment conceptualization)	Explicates student teachers' theories of practice as standards for designing and evaluating teaching Reflects on student teachers' teaching retrospectively and prospectively Includes pupils as sources of feedback Explicates teacher educator's pedagogy
Deliberate practice (regulation conceptualization)	Informs about learning to teach Explores the affordances of school contexts for student teacher learning Crafts realistic plans for student teachers' professional development

A formative intervention is an emergent, contextually embedded intervention designed to promote change in work and educational practices and, as a result of and at the same time with the aim to, to foster innovative ideas and new conceptual understandings (Engeström, 2011). The outcomes of formative intervention are not specified beforehand, as the aim is to generate new understandings and practices using conceptual models and so-called mirror-data (Engeström, Rantavuori, & Kerosuo, 2012). Moreover, teacher educators are deliberately not seen as “passive executors” of a predefined intervention design, but as active agents, with valuable knowledge and expertise (Blackler, 2011).

A characteristic of formative intervention methodology as it is currently described in the literature, is that the intervention is situated in sessions that are separate from the ongoing activity, although they take place at the site being studied (Engeström, 2011). Sutter (2011) has challenged this procedure as it “strongly underestimates the resource that participants besides the professional researchers might bring to the research endeavor” (p. 698). She advocates that it might be more productive to have researchers and practitioners collaboratively work on a shared goal or object, as this would allow them to really take advantage of their the other's expertise. As a result, in the two formative interventions reported on in this study, two pairs of teacher educators collaborate with a researcher-interventionist in working on their shared goal of exploring how MOL and DP can be fostered in their existing teacher education curricula, in intervention sessions that are integrated in the ongoing activity. Our research question is: *what insights and practices on fostering MOL and DP within an existing teacher education curriculum are developed in two parallel year-long formative interventions, building on the ideas captured in the design principles?*

## Methods

### *Context of the study*

The formative interventions we report on were conducted in a one-year, post-graduate teacher education program, leading to subject-specific teaching licenses to teach all grades of secondary education. The teacher education program is offered by a large university in the Netherlands and has 18 different subject-matter specific tracks. Students enter the program after obtaining a subject-specific master's degree (e.g., mathematics, history, French).

The program's pedagogy has been described in numerous studies (e.g., Korthagen & Kessels, 1999; Tigchelaar & Korthagen, 2004) and has served as a foundation for describing fundamental principles of teacher education (Korthagen et al., 2006). The program's educational philosophy can be described as realistic (Korthagen et al., 2001), in that it takes student teachers' teaching experiences as a starting point for students' learning and development and actively seeks to link these experiences to theory in teacher education classes. As such, about half of the program is situated in school, either as an internship or as a paid job. This *dual* curriculum of the teacher education program is visualized in figure 4.1.

	<i>First semester</i>	<i>Second semester</i>
<i>University</i>	Topical seminars	Practice-based research
	General pedagogy and reflection class (" <i>Mentor group</i> ")	
	Subject-specific pedagogy class (" <i>Subject matter group</i> ")	
<i>School</i>	First internship	Second internship

Figure 4.1. *Visualization of the teacher education program; per semester and location. Width of the rows indicates the weight of the course in terms of credits; length of the columns indicates duration of the course in the year long program.*

As Figure 4.1 illustrates, there are two main classes in the institute part of the program: a general pedagogy and reflection class and the subject specific pedagogy class, which run the entire year. In addition, several topical seminars are offered, which the student teachers' select based on their learning needs and prior education and experiences. During the second half of the program, student teachers conduct a practice-based research project on a topic of their own choice. The school component of the program takes place in secondary schools, supervised by school-based teacher educators, including a mentor. During this first semester, most student teachers start with observing their mentor's teaching. Eventually, all students teach 20 hours or more at a secondary school. During the second semester, the

institute part of the program remains roughly the same, although the number of meetings per class is somewhat reduced. Again, half of the study load is allocated at schools, but the required number of hours taught at school increases to at least 100. The program assesses its students based on the nationally established end-terms for university-based teacher education programs, using an electronic portfolio.

### ***Participants***

To compare the ways to foster MOL and DP, building on the same design principles, within different existing curricula, we engaged in two parallel formative interventions in the two main courses of the teacher education program. To that end, we purposefully invited (Onwuegbuzie & Leech, 2007) four teacher educators to participate, for the following reasons. First, these teacher educators partially taught the same group of students, which we expected would allow for more detailed cross-case comparisons. Second, we wanted the teacher educators to team-teach their students, as we expected this would require more explication of their pedagogy and thereby of their developing knowledge. Third, the teacher educators needed to be willing to critically analyze their pedagogy and experiment with new practices.

Two teams of the teacher educators met these requirements. As a result, the researcher-interventionist (i.e. the first author), a PhD researcher with a background in educational sciences, collaborated with the team of teacher educators teaching the subject-specific class for history teaching and with the team of the general pedagogy and reflection class for social sciences (i.e., students learning to teach history, economics, social studies, geography, philosophy or religious studies). The team teaching the subject-specific class for history teaching consisted of two experienced teacher educators, both with extensive experience as a secondary school teacher for the specific subject (i.e. in this case history), as is common for teacher educators in the Netherlands (Hamilton & Clandinin, 2011). We refer to them as Taylor and Jamie (both pseudonyms). The history subject-specific class, referred to as “subject-matter group” in the program (cf. Dobber, Akkerman, Verloop, Admiraal, & Vermunt, 2012) and therefore in the remainder of the chapter, ran the entire year. It consisted of 13 regular three hour lessons dedicated to history teaching in the upper level of secondary education, as well as 4 three hour lessons and a two day school-based practical that were dedicated to interdisciplinary social science teaching (cf. Tuithof, de Heer, van Rijswijk, & Bronkhorst, 2010). The team taught a relatively large (26 students), and diverse group of student teachers who all agreed to participate in the research.

The team teaching the general pedagogy and reflection class for social sciences consisted of one very experienced teacher educator and trainer, and one teacher educator who has less experience as an educator, but who was also active as a secondary school teacher. We refer to them as Sara and Erin (both pseudonyms). The general pedagogy and reflection class is referred to as “mentor group” in the program (Dobber et al., 2012), which is the term we will use in the remainder of the chapter. The curriculum of the mentor group consisted of 21 three hour lessons spread out throughout the year. Next to teaching, this team of teacher educators was also responsible for the assessment of student teachers’ portfolio. The mentor group started with 12 student teachers of different subjects in social sciences, of whom all agreed to participate in the research. Half of the students in this group were studying to become a history teacher

and therefore also participated in the subject matter group. Three student teachers dropped out of the program during the year for reasons unrelated to the research.

### ***Formative interventions***

The design principles presented in the theoretical introduction were used as a starting point for this addressing the shared problem of how to foster MOL and DP, but we set out to have the ideas developed through the collaboration build on these principles. Hence, our design corroborates the underlying principles of formative interventions. To have fostering MOL and DP become a shared problem space (Akkerman & Bakker, 2011), we adapted the research design (for a more elaborate description see Bronkhorst, Meijer, Koster, Akkerman, & Vermunt, 2013). Following the recommendation by Sutter (2011), in this study the intervention sessions were integrated in the teacher educators' existing way of working. This meant that the researcher joined the biweekly meetings that the teacher educators traditionally had to discuss and prepare their classes. In these meetings, previous classes were evaluated and subsequent classes were designed.

The researcher employed several tools developed in formative intervention research to stimulate the progressive changes in understanding and practices on fostering MOL and DP. First, so-called "mirror data"- that is, ethnographic data from the classes - was collected and discussed among the researcher and the teacher educators. This mirror data included, among others, observations the researcher made during classes, classroom material and student teachers' reflections on the classes in an online survey or an online learning environment. This data provided the teacher educators and the researcher-interventionist feedback on the outcomes of the redesigned teaching and is therefore expected to stimulate involvement as well as to generate collaborative reflections on the ongoing change process (Engeström & Sannino, 2010). Second, the researcher introduced conceptual models, on which she based her thinking, captured in the designed principles, which were used as an analytic framework to analyze the mirror data.

The specifics of the collaborations were discussed before the onset of the formative interventions, and reflect both the researcher-interventionist's and the teams of teacher educators' motives for the collaboration. As a result, there were some differences between the formative interventions in the subject matter and the mentor group. For instance, to collect mirror data, the subject matter group opted to have the researcher-interventionist send their students a short electronic survey after each meeting, whereas in the mentor group the teacher educators preferred to dedicate the last 15 minutes of each class to collect such mirrors from the students themselves.

Following Maxwell (2004b; 2004a) we expected that the prolonged engagement at this site, and the rich data to be collected, would afford an in-depth examination of the development of the insights and practices of fostering MOL and DP.

### ***Data sources***

The following data sources were used in the analysis.

*Audio-taped preparatory meetings and evaluation meetings.* During these meetings the teacher educators and the researcher-interventionist evaluated past lessons, based on mirror data, the researcher-interventionist's observations and teacher educators' experiences and reflections. They also planned the subsequent meetings and discussed student teachers' progress. These meetings thus served a dual purpose – not uncommon in intervention research conducted in educational practice (Akkerman et al., 2013): they are at the same time informative of teacher educators' understanding of fostering MOL and DP, yet they were also intended to collaboratively develop this understanding further. These meetings normally lasted about two hours. The researcher participated in all 15 meetings for subject matter group and 17 out of 21 mentor group meetings.

The *start and end interview* between the researcher and teacher educators marked the beginning and end of the formative interventions per team. Both group interviews focused on a reflection on the changes in course pedagogies; at the start these concerned the intended changes; at the end, the realized changes in pedagogy. Both start interviews lasted about one hour and the end interviews about two hours. All interviews were fully transcribed.

*Lesson plans* refer to the detailed description of the plans for a specific lesson, containing previous homework, lesson goals and concrete activities for teacher educators as well as student teachers and necessary materials, including handout. They were normally made in the preparatory meetings and are two to three pages long.

The researcher kept a *logbook* per formative intervention intended as a tool for quality assurance (Akkerman et al., 2008). This is a document in which she documented observations, reflections, decisions and quality concerns relating to the object of the formative intervention (i.e., the nature of student teachers' learning) as well as the research design itself. As such, it also documented the more informal interactions between the teacher educators and the research-interventionist that were not captured by other data sources.

### ***Analysis***

The end interviews with the teacher educators were taken as starting point for the analysis. The first author scrutinized the transcripts for indications of changes or insights in the teacher educators' pedagogy that were seen as the main outcomes of the formative intervention according the educators themselves. In the end interview of the subject matter group four main changes or insights were identified; in the mentor group three were identified. These were taken as sensitizing concepts for the analysis of the other data sources. Starting from the researcher's logbooks – as these contained notes on the other data sources, as well as more informal interactions - these changes or insights were traced back in the preparatory and evaluation meetings and lesson plans, by means of qualitative content analysis (Lichtman, 2006). Subsequently, this segmentation of the data concerning the main changes or insights in pedagogy was ordered chronologically per formative intervention. This resulted in an overview of how and why these issues came about and how the teacher educators intended to proceed with these issues after the collaboration in the formative intervention had ended, with references to the different data sources. Such

a case description of the developing insights and practices per case has been claimed to do justice to the complex interactions of processes in specific contexts (Maxwell, 2004b).

We compared the changes and accompanying rationale across the two groups to discover overarching themes (Boeije, 2002). From this analysis, it appeared that all seven changes or insights were related to two main issues, which played a role throughout the year in both formative interventions, although in different ways. These issues could be connected to literature on teaching in teacher education, more specifically to literature on modeling by teacher educators (Lunenberg et al., 2007) and pedagogies of practice (Grossman et al., 2009) or to literature exploring tensions in teaching about teaching (Berry, 2007). Subsequently, the data was interpreted with these conceptual lenses (in line with the grounded theory approach by Beth, Sturges, & Klingner, 2005), which enabled us to identify more explicitly how the developed insights and practices corresponded to as well as elaborated upon the existing understanding in the literature.

The results section describes these two themes per group, with explicit reference to the seven changes that constitute them (*in italic*).

## Results

### *Capitalizing on second-order teaching*

The first theme represents the main way in which the teacher educators sought to stimulate MOL and DP; by using their own teaching as an explicit model to benefit students' learning. We conceptualize this as capitalizing on "second-order teaching", a concept introduced by Murray and Male (2005). In both formative interventions the teams aimed to show student teachers how MOL and DP played a role in their teaching and subsequently, how it could play a role in student teachers' learning to teach. To that end, the teacher educators tried to engage student teachers in different components of MOL and DP to not only understand, but also experience MOL and DP. The way in which the teacher educators did this differed across groups.

#### *Subject matter group*

Inspired by the shared goals of the formative intervention, as well the teacher educators' own research interests and practical circumstances (such as the relatively large size of the group and the diversity of the students), this team opted to make their student teachers' theories of practice be more explicit and more informed. In line with MOL, the teacher educators argued that theories on history teaching should be a main source informing this theory of practice. In line with the enactment conceptualization of DP, the teacher educators focused on the link between student teachers' theory of practice and their teaching. The pedagogies were not so much focused on the student teachers' understanding their own learning, but on the learning of their pupils - as the teacher educators contended this was the task of the mentor group.

To stimulate MOL and DP, the teacher educators came to cultivate goal-directed teaching through what they referred to in the end interview as a “whole deliberateness package”. For the teacher educators, this referred to teaching and collecting feedback about the extent to which these goals were realized – an integration of MOL and DP for student teachers as well as teacher educators themselves.

In the beginning of the year, this goal-directed teaching applied mainly to the teacher educators’ goals for the student teachers, which this team strove to stimulate by means of assignments that student teachers needed to complete in their portfolio. These assignments for student teachers included writing a position paper about their own theory of practice of history teaching to stimulate MOL. Additionally, a “logbook” assignment was also included (and also used as mirror data). In this logbook, which resembles a so-called “exit slip”, the student teachers were asked to report: 1) their main learning gain of the particular lesson; 2) how this related to their theory of practice on history teaching; as well as 3) how they could apply this learning in practice; and 4) if they could formulate a concrete resolution to do so. In this assignment the link between MOL and DP is explicitly made, corresponding to the teacher educators’ understanding of goal-directed teaching.

After two lessons, the mirror data showed that student teachers noticed and appreciated the teacher educators’ goal-directed teaching. This made the teacher educators more conscious of the power of second-order goal-directed teaching. In subsequent lessons, the teacher educators not only asked to student teachers to be goal-directed, but also explicated the informed goals of their own pedagogies. Additionally, they increasingly used student teachers’ logbooks and remarks during lessons as feedback.

In the end interview, the educators summarized how this second-order goal-directed teaching integrates their own teaching as models with instructing student teachers about teaching:

Jamie “We had them reflect more on each lesson. Using those logbooks.”

Taylor “[...] For me, that is actually the whole deliberateness package. That you’re clear about your goals. That you revisit them [during class]. And that you have students attach learning goals to them. That’s what we’ve done, in fact. That’s a whole line. And that is what I appreciate. [...We have been] linking a lot more to the goals. As in: what do we really want them to know?”

This integration of modeling and instruction was also apparent in other, more informal types of second-order teaching, which mainly took shape in terms of explicitly being a role model of teaching. The teacher educators deliberately set out to show more of their expertise as teachers; not just by teaching, but also by explicating their teaching, which is referred to as “meta-commentary” in the literature (Loughran & Berry, 2005). Educator Taylor emphasized this outcome in the end interview: “We have been more conscious of our role as exemplar. As expert. And [we] have hit upon ideas about how we could extend that further”.

This explication of expertise often took form by asking the student teachers about what they taught the teacher educators’ reasoning was behind their pedagogy: “Why did we ask you to do this? How could we have done this differently?” Such questions are not mentioned in lesson plans, but did occur in almost all plenary discussions, after student teachers’ had worked on assignments in groups.

Combining goal-directed teaching and explicating exemplary teaching, the team developed a sequence of steps to introduce a new “work format” or pedagogy in such a way that student teachers would understand the underlying reasoning (MOL) and would be able to use the work format effectively in their own teaching (DP). The first step is trying out the work format with the teacher education content (e.g., a theory on history teaching) and asking the student teachers to comment on the teacher educators’ rationale to use it. Student teachers were asked to evaluate it as a learner, in a meaning-oriented way, focusing on understanding. The second step is trying it out with school content the student teachers would be teaching (e.g., a historical topic) and asking the student teachers to comment on the rationale as teachers. The third step is extending the student teachers’ role as teacher by having them design an instruction for this work format for their school content, as this would enable enactment in the students’ classrooms (educator Jamie):

“But actually, I think that you should ask students to: ‘Design an adaptation to use in your class next week’. Because otherwise, students will not make that step in thinking. [...] You really need to support them, to make that step to their own classroom practice”.

The last step is reflecting collaboratively on practical and theoretical aspects of the work format or pedagogy. In moving through these steps, it appears that in second-order teaching, educators integrate modeling with instruction, whereas student teachers shift from being engaged as a learner to being engaged as a teacher.

#### *Mentor group*

The mentor group team understood MOL as developing a personal theory of practice, in line with “Who you want to be(come) as a teacher”. They focused on the regulation conceptualization of DP, addressing learning to teach on a meta-level. From the beginning, this team reasoned that stimulating MOL and DP would be done best by explicating their reasoning behind their teaching, as most of their design principles were already part of their curriculum:

“We don’t need to make dramatic changes, I think. [...] I can imagine that it would be helpful to involve it [a theoretical model introduced by the researcher-interventionist] continuously in preparing lessons. To describe: how do we justify what we do in the lesson?”

However, the educators did not want to make this *explication of their own pedagogy* be too explicit, as that might belittle the student teachers or put too much emphasis on the teacher educators’ teaching, which might add to the complexity of learning to teach. In the first week, the team used a theoretical model of learning to teach in explaining the reasoning behind their own pedagogy, and asked student teachers to evaluate the lesson in terms of their learning. After six weeks, the issues of explicating the pedagogy arose in the first individual supervision meetings with the student teachers, which was discussed as mirror data, introduced by educator Sara:

“What she [student teacher] mentioned: “Then you could make explicit how you work. And why you think that is important. [...] Because it’s a bit up in the air at the moment.””

As a result, the educators prepared an interactive lecture to address theories underlying their pedagogies. With this lecture, the explication of teacher education pedagogy gradually turned into an ongoing *instructional conversation about learning to teach*, as the reasoning behind the educators’ pedagogy was primarily rooted in theories on learning to teach – in line with their objective of addressing student teachers’ learning from a meta-perspective. This ongoing instructional conversation took place in class meetings, but mainly in individual supervision. In a preparation meeting for a subsequent lesson, the researcher-interventionist summarized it as follows after three months – which the team agreed on:

“We are mostly working on, using my words, learning about learning. So, you [the educators] give quite a lot of information about learning as a teacher. [you] explicate what you do and why you do that. And, [you] explore how students can follow through on their own development.”

This summary of their pedagogy does not differentiate between teaching about learning as a teacher, explicating teaching and stimulating the students to use these things to benefit their own development. In the end interview, educator Sara mentioned the effects of engaging students in this instructional conversation in this way:

“But I also think that we engaged in this conversation with our student teachers more explicitly, about how we try to supervise them in their development. So they can assume responsibility about it. And that they have that discourse. That you can recognize in their portfolios and in conversations.[...] Based on my experience, I think that [how] the students, on average, write about themselves in their last portfolio, [and] talk in the final supervision...that that is special. That is really different from other years.”

Engaging the students in the conversation about their own learning, and the pedagogies educators use to stimulate that, thus enabled the educators to transfer the responsibility as student teachers developed the language and the understanding of their own learning.

### ***Requiring or seducing***

In both formative interventions another main issue was prominent throughout the year, namely the way the educators could engage students in MOL and DP, especially when students were not inclined to do so on their own. Both groups argued that the educators’ goals of fostering MOL and DP was not always in line with students’ learning needs in terms of content, nor were the pedagogies advocated in terms of the design principles in line with students’ preferred approaches to learn in terms of pedagogy. This resulted in so-called “tension” between different pedagogical demands (Berry, 2007), especially since the program’s realistic pedagogy testified that teacher education pedagogies should start from student teachers’ concerns. Moreover, in the program, and across the two groups, there was a general assumption that every student teacher “should become his own [kind of] teacher”, which seemed at odds with favoring certain ways of learning and developing over others. How to manage this tension between educators’ goals and students’

preferences was a recurring challenge for both teams, which they addressed in two different ways, namely by requiring and by seducing.

#### *Subject matter group*

In the subject matter group this theme was mainly discussed in terms of content in relation to the role of theory, which plays a main role in the educators' goal of having the student teachers' theory of practice be more informed – their understanding of MOL- but was traditionally not valued or used much by student teachers in their experience. The subject matter group team aimed to have students engage in MOL and DP, by including more obligatory *assignments or tests*, in other words by “requiring” students to show MOL and DP. The pedagogical beliefs espoused at the history department, with which these educators recently started collaborating more, have also had an influence on this, as Taylor explains:

“Our starting point and experience is that with some more regulation and testing, students do absorb theories. [Our] experience in a good subject matter group last year was that students hardly read. [...] So, the changes [in our pedagogy] are also a result of that.”

In the start interview the educator Jamie expressed the belief that “Some things need to be obligatory, because students will not do them if not”, referring mainly to reading and actually using theories on teaching history. Later on he added: “Some [student teachers] will, but they would do it without our interference as well”. Consequently, the team included several assignments, which required the use of theory, such as a formative test of literature read as homework and using a conceptual model on historical reasoning to interpret think aloud protocols of pupils. After three months, Taylor reflected that they have “never taken theory this far with students”. Although the educators see theory as the core of subject specific pedagogy, the researcher-interventionist often recorded how the team voiced their concerns with balance in her logbook: “What do we provide the students and what do they want?”

This issue resurfaces in almost every preparation meeting. The educators appeared to fear to be considered too theoretical, or not practical enough, since that is what they think the student teachers' want. In the logbook, the researcher-interventionist interpreted this as:

“The tension between what they want the student teachers to do/learn/feel/think and being of service/supportive to the student teachers in their current phase of development - as in provide them with examples of pedagogies (“work formats”) they can use in their class.”

This is complicated even more by the fact that the educators believe that practical examples of pedagogies, or work formats, introduced deliberately (see previous section), are a very powerful means to stimulate enactment, their understanding of deliberate practice. In the end, the subject matter group educators relied on *designing meetings that combined* the different things they considered important for their students' MOL and DP. Throughout the year, the educators often commented that “there is not enough time” or that they as educators “aspire too much”, and they are often not able to complete everything that is in their lesson plan. Yet, in the end interview they appear to be satisfied with their balancing act, which educator Taylor describes:

“I think...what we do well now is combining. So, both reflection and the theory. We offer both theory and reflection, by linking it to your own teaching. And [we also include] practical elements, comparable to a training. Those three lines are all included now, in a balanced way. And I do think that is an somewhat of an accomplishment, as these are things that can cancel each other out...or things that are not always represented in one person. [...] We now know how to balance these things. Which makes them [the students] really satisfied this year about the subject pedagogy class. Even though we had such a diverse group. Because other groups might be easier to satisfy.”

#### *Mentor group*

The mentor group team explored the issue of how to engage students in MOL and DP in terms of content (mostly related to the role of theory) and in terms of learning approach. Already at the beginning of the year, the team remarked upon the contradiction in developing pedagogies that would provide external stimuli to have students engage in MOL and DP, when MOL and DP are essentially grounded in notions of intrinsic or autonomous motivation to learn and develop. Regulating their student teachers too much, for instance via structured assignments – on which they traditionally relied less than the subject matter group - would, for them, essentially undo any effect such an assignment would have. For instance, in discussing an observation assignment to foster student teachers’ DP in school, they argued: “if we prestructure it, then we don’t invite them to consider the question: ‘why do I actually want to know this?’”

This issue was complicated further, seeing as these educators’ efforts were geared to have students appreciate MOL and DP on their own accord, as “Eventually it is the goal that they themselves [i.e. the students] would also do it. That they no longer need us for that.” (start interview). Similar to the subject matter group, the educators felt that pedagogies aiming to stimulate MOL and DP, described in the design principles, would in itself require an appreciation of understanding teaching (MOL) and of regulating your own development (DP), and would therefore probably be appreciated and understood best by those students who would already be inclined towards MOL and DP. Other students might consider their pedagogies and other efforts to move students to MOL and DP as irrelevant:

“If you can work with this, that in itself will likely be highly related to learning style. The challenge is to make this meaningful for everyone”.

Most importantly, the educators’ objection to requiring student teachers to engage in MOL and DP was principled, and grounded in their assumptions about student teacher learning. In line with the program’s realistic philosophy, the educators believed that student teachers only learn theories on learning and teaching when they would be explicitly linked to their experiences in practice and related concerns: “We can tell them everything, but if they are not truly involved in it, it will just not enter”. Consequently, “It has no use if we tell you: ‘You need to read that chapter’, when it has little to do with your school practice.”

These considerations and how to deal with them became somewhat of a stalemate, which the educators sought to address by sharing them with their students, in line with their general aim of explicating pedagogy in a way that it addresses student teacher learning:

“I was rather satisfied, because it’s on the table now. So it became more theirs. [...] They need to address that book. Apparently, it’s there. Theoretical sources are important. [...]. So, that dilemma is now something they acknowledge.” (educator Sara)

After introducing this dilemma in the beginning of the program, throughout the year, the educators sought to “seduce” student teachers towards MOL and DP, *working from the students’ concerns and preferences towards the educators’ goals*:

“Then it depends on what students bring to the table. I think it is powerful that when you follow students’ experiences or input, you can add theory or something else which makes them realize, hopefully: ‘Oh, right, that’s what it means’. Whereas if you add it up front, you really just present them with preconceived notions.”

In the mentor group end interview, this seducing way of managing this tension reemerged in relation to the role of theory, as educator Erin revisited her assumptions:

- Erin “Well that this program’s assumption, that when you [as a student] have a certain concern, then you should browse through your book or look it up. But that’s very individualistic of course: you can’t have a real dialogue about it [...].”
- Sara “But by just testing [requiring] it, you sort of give the impression...well, I don’t have an answer, but then you seem to admit: otherwise student teachers will not do it. That is complicated for me. [...].”
- Erin “Yes, but is it also important, of course, the fact that students are only in the program for one year, and some concerns only arise after three years in practice. [...] Sometimes it can be really helpful to learn about things that are not directly the result of your concerns from your own practice.”

Therefore, although the mentor group educators believe that seducing students towards MOL and DP should be the way to go, they also perceive drawbacks, which are not easily resolved.

## Conclusion and discussion

We set out to explore how meaning-oriented learning (MOL) and deliberate practice (DP) could be stimulated within an existing teacher education curriculum by means of two parallel formative interventions. Our results reaffirm other studies that show how different groups, working with the same researcher-interventionist and the same design principles as point of departure, develop idiosyncratic ways of working (e.g., Teräs & Lasonen, 2013); use the design principles as tools in object-oriented activity (e.g., Eri, 2012); and therefore come to develop different understandings and practices (Engeström, 2011). Interestingly, despite these differences, two shared issues emerged which can thus be seen to be of importance in fostering MOL and DP in teacher education.

The main way in which both groups have addressed fostering MOL and DP is through *capitalizing on second-order teaching*. The concept second-order teaching is introduced by Murray and Male (2005) as the teaching of teaching in higher education. For the educators, this entailed taking advantage of the opportunities teacher education provides by virtue of the correspondence of the content which is being taught (i.e. teaching) and the pedagogy. The educators in our study did this in different ways, in line with

the objectives of the respective courses. In the subject matter group, second-order teaching included teacher educators' explicit modeling of two design principles - which advocated having students work from their explicated theories of practice and have them use pupils as sources of feedback. By explicitly modeling these actions, the teacher educators showed how working from a theory of practice and securing feedback were part of MOL and DP, as well as part of good teaching itself.

Additionally, the teacher educators engaged their student teachers in these actions, by having students, first, think along with the educators about why they had planned a certain classroom activity in such a way and/or what other opportunities they could have considered. Extending what has been described as meta-commentary of the educators to explicate teaching (Loughran & Berry, 2005), this can better be described as "meta-questioning" students about pedagogies. Second, by having student teachers design and play out similar activities and third, by having student teachers make well-informed and well-reasoned resolutions about how they could design such activities for their own classroom. These activities resemble the different activities of "pedagogies of practice" (Grossman et al., 2009), namely representation, decomposition and approximation of practice. The difference is that in our study, educators' teaching is put to use for these three activities, while gradually shifting the student teachers' engagement from the position of learner to that of teacher.

The mentor group sought to take advantage of the correspondence in content and pedagogy by explicating the reasoning behind the pedagogies to foster MOL and DP. At the request of the student teachers, this reasoning became more and more explicit, while at the same time tied more closely to instructional conversations with student teachers about their own learning, explicitly informed with theories. In this way, the mentor group educators' second-order teaching integrated explicitly modeling teaching with the design principle that specified the importance of informing students about learning to teach.

In contrast to our previous study in which we developed the design principles (Bronkhorst et al., 2011), the educators did not treat modeling, accompanied by meta-commentary or meta-questioning as a standalone activity: it was integrated with other goals and combined with other pedagogies to stimulate MOL and DP. We partly see this as the result of our research design: in discussing teaching in teacher education – as we did in our previous study (Bronkhorst et al., 2011) - modeling and instruction can be distinguished as two separate teaching activities. However, in teaching in teacher education, modeling and instruction should be integrated to be able to capitalize on second-order teaching.

Interestingly, previous research hinted that the effect of explicating your own pedagogy as a teacher educator would be stronger if the link to student teachers' practice would be made (Bronkhorst et al., 2011), yet observational studies showed that teacher educators struggle with supporting students in doing so (Lunenberg et al., 2007). Engaging students in teaching activities as learner and as teacher seems to be a way to foster that connection to the classroom, while at the same time handing over the responsibility from the teacher educator to the student teacher. For the mentor group, handing over the responsibility for MOL and DP was an explicit aim – in line with work on whole-class scaffolding (Smit,

Van Eerde, & Bakker, 2012). However, ideas of how this responsibility could be handed over remained exploratory in this first formative intervention. It would be interesting for further research to explore how students' engagement in second-order teaching as a learner and as a teacher could be gradually increased.

Another theme arose in both groups, namely the issue how to address student teachers' learning preferences in terms of content – mainly related to the role of theory – and in terms of learning preferences – especially when this differed from MOL and DP. In line with how this issue was treated by the educators throughout the formative intervention, we conceptualized this issue as a tension: being pulled in different directions by competing pedagogical demands (Berry, 2007). The teacher educators in this study sought to manage this tension in different ways: in both teams, the teacher educators always made an effort to meet student teachers' learning needs and preferences, but how the teacher educators dealt with having student teachers move towards MOL and DP differed. These differences are clearly visible in how the educators approached theory as a tool for student teachers' learning. The subject matter group explicitly experimented with taking theory as a starting point, instead of always starting with practice – in line with the realistic approach espoused at the institute (Korthagen et al., 2001). In contrast, the mentor group felt that starting with theory would color individual student teachers' experiences too much in advance, which would make it less authentic and less meaningful. This, in turn, would result in it not being “really learned” nor appreciated by the student teachers.

As such, the subject matter team relied more on *requiring* student teachers to engage in MOL and DP, mainly via assignments. The teacher educators combined this with giving practical examples of pedagogies or work formats student teachers could use in their own classrooms. They were excited about this combination, as they felt that both the theoretical discussions in the field of history teaching as well as their practical implications in terms of pedagogies, should be at the heart of their course and this was the only way to engage students in theory. In contrast, the mentor team relied more on *seducing* student teachers to engage in MOL and DP, even though they also knew from experience that student teachers have a hard time doing this on their own during their first year of teaching. Yet, these teacher educators considered the autonomous motivation, coupled with personal deliberations, to be at the core of MOL and DP. They also reasoned that learning in the teacher education program should be meaningful in order for students to continue to learn in a meaning-oriented way and practice deliberately after teacher education would be completed. Although the team was satisfied with making this issue a topic of discussion with the student teachers – turning it into an issue for their student teachers, not just for the educators-, for them, managing this issue extends the formative intervention. This is in line with Berry's (2007) conceptualization of tensions as issues full of ambiguities that educators need to manage, not necessarily resolve.

Interestingly, this tension was already mentioned as a provision for the design principles by the expert teacher educators, who noted that MOL and DP can be at odds with the urgency that exists in learning to teach (Bronkhorst et al., 2011): “Understanding why something would work is great, except for the fact that you have lessons to give tomorrow and you have no clue what to do.” (p. 1124). Therefore, it

was deemed important to address student teachers' appreciation of MOL and DP, next to their understanding of them. This study adds to this provision, by showing two different ways (i.e., requiring or seducing) in which this tension can be managed by the educators. A shared underlying assumption of both teams seems to be that in order to meet their goal (engaging student teachers in MOL and DP), educators started by diagnosing their students' learning and adapted their teaching accordingly. In research on thesis supervision, this has been conceptualized as "adaptivity" (de Kleijn, Bronkhorst, Meijer, Pilot, & Brekelmans, submitted). An additional challenge in the context of whole class teaching is to develop differentiated forms of instruction for different learning preferences (Smit et al., 2012). We hope to explore this further in future research.

### ***Limitations***

Some limitations of the present study should be discussed. In our study, MOL and DP, as well as the design principles, were studied in an integrated fashion, as the educators perceived them to be connected in several ways. Although this supports our understanding of MOL and DP as complementary, this entails that our study does not afford statements about individual concepts or standalone principles.

Moreover, our study also does not afford statements about the effects of the educators' efforts to engage student teachers in MOL and DP, nor claims about if requiring is more or less effective than seducing student teachers in promoting MOL and DP, as the analysis of the mirror data is done during the formative intervention meetings. We can only show how the educators explicated their developing understandings, yielding descriptive and exploratory findings. Additionally, in our analysis and presentation of the findings, we focused on the two themes that played an important role across the two formative interventions, which may have underrepresented the insights and practices of each individual team of educators.

### ***Implications for formative intervention research***

Formative intervention research is among the few research approaches that explicitly acknowledge that "it is not at all clear just what needs to be learned" (Engeström, 2011, p. 599) in exploring complex issues, while at the same time "in different ways take advantage of the contributions that participants besides researchers provide to the joint endeavor" (Sutter, 2011, p. 702). Even though Engeström (2011), who coined the term formative intervention research, argued that some researchers downplay the role of educators (or other practitioners) in writing up their study, we would argue that, ironically, in the literature on formative interventions, it is the role of the researcher that tends to receive too little attention in the analysis and documentation of the research.

Based on our study, we argue that the role of the researcher should also not be underestimated. This study intends to serve as an example of a formative intervention in which the researcher-interventionist and the practitioners, in this case the educators, have a shared object, namely stimulating student teachers' MOL and DP. They have different motives for doing so (cf. Akkerman et al., 2013), as the researcher-interventionist is primarily interested in enriched understanding, whereas the educators are

primarily interested in suitable developing pedagogies. Sutter (2011) invited such an extension of formative intervention research methodology as in this way “the participants may mutually support each other in the joint developmental endeavor. It is acknowledged that the other activity and the research activity might be conducive to each other, that the partners might be supportive of the research activity as well as the other way around.” (p. 698). Although our study was designed to have the research benefit from the educators’ expertise (cf. Bronkhorst et al., 2013), our results also indicate how the educators benefitted from the research. Both pairs of educators mentioned repeatedly how the presence of the researcher-interventionist and different aspects of the research design made them more conscious of their teaching. Additionally, for the subject matter group the mirror data became one of the main tools to stimulate MOL and DP in second order teaching.

In contrast, we would also like to stress that the role of the researcher in fostering innovation and developing the understanding in formative interventions should not be overestimated. Throughout the formative intervention, the educators stressed how that they themselves, their understanding of their pedagogy and their understanding of how to foster MOL and DP was influenced by several things outside the research. These include collaborating with colleagues from different departments, the composition of the students in the groups, the fact that the educators themselves were starting to become engaged in research and their reification of the formative intervention to other interested parties at symposia. We see this as naturally occurring processes in a year-long project, which actually enriched our formative intervention. We hope that future research will also include these descriptions or explore ways to benefit from these interactions even more, as they are instrumental in developing intervention research methodology.

#### ***Implications for fostering meaning-oriented learning and deliberate practice***

“Accepting the benefits of research engagement for teachers’ professional development and to school improvement does not necessarily mean that the substantive research findings are valued beyond the contexts in which they are produced and embedded” (Kershner & Hargreaves, 2012, p. 279).

We feel that the substantive findings of our study can be seen to have the following implications. In terms of capitalizing on second-order teaching, in the literature the complex nature of teaching about teaching, with corresponding content and pedagogy, is often problematized as it makes the teacher educators’ task complex (Murray & Male, 2005). Our results show how several of the developed design principles are actually supported by this correspondence of content and pedagogy, by means of modeling and meta-questioning. This could imply that all the design principles to foster MOL and DP in teacher education can be introduced by instruction or by modeling. Moreover, our study shows how educators can capitalize on second-order teaching, by engaging student teachers in the interchanging positions of learner and teacher.

In terms of managing the tension between educators’ goals and students’ learning preferences, our study illustrated two different ways engaging students in MOL and DP; requiring via assignments or

seducing via instructional conversations. Our results can be seen as a reminder that, although in general different students in different phases of their development might require different approaches, the approach chosen should also be in line with the educational context at hand, including the objectives of a course and educators' theories on learning and teaching.



## Chapter 5 Consequential research designs<sup>5</sup>

### Abstract

Collaboration between researchers and educators in conducting intervention research is increasingly common, as it is assumed to benefit educational practice. Alternatively, in this study, we explore the consequences of a collaboration between a researcher and teacher educators on research quality. Based on our analysis of a year-long collaboration in formative intervention research, we find that educators experienced their own position as agent, the researcher's position as learner and the research itself as integrated, as being different from previous experiences in research. The educators indicate that these differences are consequential for their engagement in the research. We discuss how this, in turn, might benefit research quality.

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<sup>5</sup>This chapter is based on Bronkhorst, L. H., Meijer, P. C., Koster, B., Akkerman, S. F. & Vermunt, J. D. (2013). Consequential Research Design in Research on Teacher Education. *Teaching and Teacher Education* 33, 90-99. doi: 10.1016/j.tate.2013.02.007

## Introduction

There have been calls for changing the position of researchers from isolated and distant observers towards taking a collaborative stance, involved with the diverse stakeholders of the educational practices concerned (Almekinders et al., 2009; Edwards et al., 2007; Lassiter, 2008). Especially in educational research, this call is mirrored by government policies in Western-European countries that explicitly include collaborations between researchers and practitioners as criteria for funding (Rickinson et al., 2011). Collaboration is particularly debated in educational *intervention* research situated in real life contexts (Eri, 2012). Often this concerns research in which carefully designed innovations (i.e., the interventions) are introduced into educational practice. A primary example of this is design research (Cobb, Confrey, diSessa, Lehrer, & Schauble, 2003; Kelly, 2003), which originated in the USA in the final decades of the previous century to understand the affordances of designed educational interventions in their full classroom complexity (Akkerman et al., 2013).

As educators are regularly responsible for the implementation of the interventions, researchers often include a training to prepare them for this task. The assumption is that this training will encourage new knowledge and beliefs, will result in new teaching behavior, and will, in turn, lead to different student outcomes (Clarke & Hollingsworth, 2002). Results from various studies indicate that this might not be how change in educational practice comes about (Bakkenes et al., 2010; Clarke & Hollingsworth, 2002; Guskey, 1986). There is growing evidence that educators are not passive acceptors of these interventions, but active modifiers, adapting the intervention to local circumstances (Rogers, 2003).

In response to this recognition, some researchers set out to explore “how *well* an intervention is implemented” (O’Donnell, 2008, p.33 italics added), compared to the original design, and consider ways to increase this so-called fidelity of implementation. For others, the choices educators make in the implementation of the intervention, and their supporting rationale, has become an object of research (Edwards et al., 2007; Könings, Brand-Gruwel, & van Merriënboer, 2007).

Besides considering how, or how well, educators implement designed interventions, some researchers express a growing appreciation for educators’ complementary expertise in this respect (Könings et al., 2005; Rickinson et al., 2011). As a result, educators are being involved more deliberately in intervention research conducted in educational practice, by extending their involvement from the implementation of the designed intervention to the design (e.g., Penuel, Roschelle, & Shechtman, 2007) and evaluation (e.g., Abma, 2005) of those interventions as well. There are different research approaches that adhere explicitly to the importance of collaboration with educators or other practitioners in such intervention research (Eri, 2012), which originated in parallel in different parts of the world. Among these are (collaborative) action research (e.g., Almekinders et al., 2009), responsive evaluation (e.g., Stake, 1975), design or co-design (e.g., Visscher-Voerman & Gustafson, 2004), and formative interventions (e.g., Engeström & Sannino, 2010).

In light of this popularity, the potential impact of these collaborations has become topic of scientific and public debate (e.g., Eri, 2012). In these debates, the arguments in favor of and against collaboration seem to be grounded in assumptions about the purpose of research and to what extent it should be used to improve practice, mirrored by corresponding differences in understandings of research quality (Moss et al., 2009). Consequently, Engeström (2011) argues that some researchers actually downplay educators' involvement in writing up the research, as they suppose it might harm the quality of their research, particularly in terms of harming objectivity and generalizability (cf. Kelly, 2004). Other researchers, who defend collaborative standpoints and are explicit about educators' involvement in and influence on their research, stress that the increased relevance of their research in informing educational practice justifies the reduced rigor (Almekinders et al., 2009). In contrast to these prevalent stances, we will argue that collaborating with educators can be, in fact, consequential for research in a positive sense as well; it can also have several advantages in terms of maintaining rigor, thereby adding not only to the relevancy, but also to the quality of research.

In our study we explore educators' experiences in a research design that adheres to collaboration with educators; in this case in a year-long formative intervention in the context of teacher education. By analyzing how these experiences differ from previous experiences in research that did not seek collaboration, we aim to answer our research question: *How do educators experience formative intervention research compared to other research designs?* Following Edwards (2007) we feel that increased understanding of the impacts of collaboration with educators for research is indispensable in further developing these forms of collaborations. Therefore, in our discussion we trace the consequences of the educators' experiences for research and research quality using the four general quality concerns in social scientific research advanced by Guba (1981) as a frame of reference.

### ***Linear and formative intervention research***

Approaches stressing collaboration with educators in intervention research go under different names and use different terms, but the underlying rationale seems similar. In these approaches, *development* is an explicit aim, either in terms of the learning of the educators involved, or in terms of the design and development of a tool. Often, a problem experienced in practice is the main reason for this intended development. That being the case, researchers purposefully involve educators in the design, implementation and/or evaluation of a suitable intervention to address the problem at hand, and sometimes also in shaping the research design itself, to profit from their expertise and knowledge of the educational practice (Könings et al., 2007). Consequently, in such research the researcher not only acknowledges practitioners' agency in giving meaning to, and therefore shaping, the research (Blackler, 2011), but also encourages, implicitly or explicitly, that agency. Educators are expected to profit from a gained, increased understanding and alternative solutions to local problems, based on the research undertaken (Engeström, 2011).

Reflecting on the research on different intervention research approaches inspired by cultural historical activity theory (CHAT), such as the Change Laboratory developed in Finland, the Clinic of

Activity developed in France and the Fifth Dimension developed in the USA (cf., Sannino & Sutter, 2011), Engeström (2011) and Engeström and Sannino (2010) proposed a differentiation between intervention research approaches that explicates the similarities in rationales many of these approaches have in common. These authors singled out four crucial elements in which “formative intervention” research, which is how they refer to intervention research that explicitly seeks educators’ engagement, differs from traditional, or what they call “linear intervention”, research. We recapitulate the four differences in the following paragraphs.

In linear intervention research, the *starting points* for the research—that is, the content and goals of the study—are determined by the researcher. The *research process* is also specified and planned by the researcher in advance of the study, and deviation from the designed process is seen as a weakness, to be worked out in future research. The *outcomes* sought are predefined variables and follow logically from the design, with the aim to generalize to other settings. The *researcher’s role* is thus to control that the research design is executed as intended. This understanding of intervention research is similar to what is prescribed in traditional methodology books and how many graduates are still being trained.

In contrast to linear intervention research, in formative interventions the *starting points* are complex, contradictory situations faced by educators, for which a solution is often not (fully) known in advance. This means that the research and the (to-be-designed) intervention becomes embedded in existing practice, and is meaningful for educators. Secondly, in terms of the *research process*, formative interventions promote deviances from the original intervention design as signs of educator agency and/or contextual reality. Common tools to enhance agency are “mirror data,” referring to ethnographic material gathered from the educational practice that is mirrored back to the educators for further reflection on their practice. Also, conceptual models can be offered for more systemic analysis of the practice. The adoption of these tools is expected to generate contradictions with the existing activity, and to give rise to change and development. Thirdly, the *outcomes* in formative interventions are conceived as being a result of choices made during the research, and thus considered emergent. As educator agency is invoked, these outcomes are inherently context-dependent. Next to outcomes concerning the research question, a key outcome adhered to is educator agency in itself, as this allows educators to address such problems in the future. Lastly, in formative interventions, the *role of the researcher* is understood as one of moderation of the research process as it unfolds in collaboration, as well as gatekeeper of the emerging understanding.

## **A formative intervention in teacher education**

### *Context of the study and participants*

The year-long study described here shares many characteristics with various research approaches that value educators’ engagement and corroborates the underlying assumptions of formative interventions. Our study was situated in a Dutch teacher education institute that offers one-year postgraduate teaching degree programs. A PhD researcher (i.e., the first author Laura, whom we refer to as the researcher in the

remainder of this chapter), supervised by three professors (i.e., the second, third and fifth author) approached two experienced teacher educators with the request to collaboratively redesign and evaluate their classes in the teacher education curriculum. Both teacher educators (i.e., Marieke and Jantina, pseudonyms) voluntarily agreed to collaborate, thereby introducing carefully designed interventions into their existing educational practice. We would like to note explicitly that no hierarchical structures were in place between the educators and the researcher, nor her supervisors.

As is quite common for the Netherlands, the research and teaching in this teacher education institute are traditionally conducted by different individuals, with a different (educational) background, interest and expertise (Hamilton & Clandinin, 2011). This being the case, the educators in this study were not assigned research tasks at the teacher education institute, and the researcher was not involved in teaching. Such differences can be understood as pertaining to different epistemic cultures (Akkerman et al., 2013). As such, this resembles a situation in which an external researcher studies a familiar site, which may differ from other countries where research and teaching in teacher education institutes are done by the same professionals or where educators and researchers are more accustomed to collaborating. This entailed that the researcher Laura had been at the site (i.e., teacher education classes) before, but still needed to develop substantial rapport, especially in light of her aim to have a more far-reaching collaboration.

### *Content of the intervention*

Collaboratively, the researcher and two teacher educators redesigned the classes of the teacher education curriculum. The primary goal of this redesign was to influence the *nature* of student teacher learning, based primarily on previous work of the researcher (Bronkhorst et al., 2011). As a previous PhD study at the same institute had shown that the nature of their student teachers' learning was far from what the educators at this institute considered desirable (Endedijk, 2010), the educators were motivated to participate in the research, especially as they expected the researcher to represent a different perspective in working on this issue. This issue of stimulating more desired student teacher learning formed a shared problem space between the educators and the researcher motivating them to collaboratively search for potential solutions (Akkerman & Bakker, 2011).

The researcher, in turn, had previously collaborated with other expert teacher educators in formulating principles for the design of teacher education classes to address this issue. These principles explicated the mechanisms, which interventions based on these principles could give rise to, based on theories on student teacher learning (Conway, 2001; Grossman et al., 2009; Oosterheert & Vermunt, 2001) and on theories of deliberate practice (Dunn & Shriner, 1999; Ericsson, 2007; Van De Wiel et al., 2011), but were still conjectural in nature. Therefore, the educators and researcher collaboratively redesigned classes that were intended to stimulate student teachers' *meaning-oriented learning* and *deliberate practice*, and as such have the research inform and improve teaching practice. In turn, this redesign would afford an increased understanding of how teacher education pedagogies can influence the nature of student teacher learning, which was the primary research objective. Details about these principles, their

transformation in the formative intervention and outcomes of the study in terms of the nature of student teacher learning are reported elsewhere (Bronkhorst et al., 2011; Bronkhorst et al., accepted; Bronkhorst, Koster, Meijer, de Kleijn, & Vermunt, in preparation). In this chapter we focus on the way in which the teacher educators experience the research *approach*, as that allows us to explore the educators' contrasting experiences in detail and in-depth.

### *Practical aspects of the collaboration*

Practically, the formative nature of the intervention was realized as follows. Although initiated by the researcher and her research objective, teacher educators' existing practice was taken as the starting point, both in terms of content and in way of working, following formative intervention research literature (Engeström, 2011). This meant that the researcher joined the biweekly meetings that the teacher educators usually had to discuss and prepare their classes. In these meetings, subsequent classes were designed, which allowed for the intervention to become embedded meaningfully in the existing educational practice. Next to that, so-called "mirror data"- that is, ethnographic data from the site - was collected and discussed among the researcher and the teacher educators. This mirror data included, among others, observations, classroom material and student teachers' reflections on the classes in an online environment. By mirroring the outcomes of the redesigned teaching, such data is expected to stimulate involvement as well as to generate collaborative reflections on the ongoing change process (Engeström & Sannino, 2010). The researcher also introduced conceptual models, on which the researcher based her thinking, such as her previous work (see Bronkhorst et al., 2011; Bronkhorst et al., accepted) and other theories on student teacher learning and development, which were used as an analytic framework to analyze the mirror data. This way of working was the result of a discussion before the intervention year started, and reflects both the researcher's and the teacher educators' motives for the collaboration. Figure 5.1 gives a timeline of the collaboration.

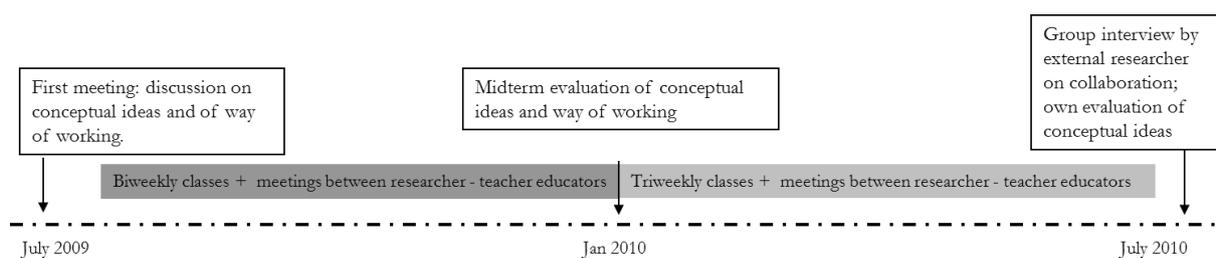


Figure 5.1. *Timeline of the collaboration of the formative intervention research*

### *Data sources*

In describing how formative interventions are experienced by those involved, we will primarily draw on a group interview conducted at the end of the collaboration. In this interview a researcher (i.e., the fourth author), not involved in the collaboration nor in the PhD researcher's supervision, encouraged the teacher educators and the researcher to reflect on their collaboration. The first part of the interview was primarily

descriptive, exploring what the collaboration had encompassed. In this part, the teacher educators and the researcher spoke freely and filled in each other's blanks. The second part was more evaluative, explicating how all participants had valued the collaboration. In this second part, the teacher educators were invited to speak their mind first.

A group interview was chosen at the request of the educators, who felt that a separate interview would not be in line with the nature of the collaboration up to that point. Moreover, group interviews afford evolving interaction, which may result in increased elaboration and discussion (Frey & Fontana, 1991). The educators mentioned explicitly that they felt free to share their thoughts, regardless of whether or not the researcher, with whom they had collaborated, was present.

To complement this retrospective account, we have also included the PhD researcher's logbook as an additional data source. From the onset of the collaboration, the researcher left an audit trail intended for an audit procedure (Akkerman et al., 2008). A vital component of this trail is the elaborate (23 775 words) logbook, containing observations, reflections, decisions and quality concerns relating to the object of the formative intervention (i.e., the nature of student teachers' learning) as well as the collaboration itself.

### *Analysis*

The first author transcribed the interview and conducted a content analysis aimed at identifying the main contrasts, in terms of the educators' experience in this collaboration compared to other research designs in which they had been involved. Considering the open and grounded nature of this analysis (cf. Bogdan & Biklen, 2003), different themes were discussed with the teacher educators and two other researchers, until agreement on the themes' content, as well as the labels, was reached. We only included contrasts that were consequential for the educators' involvement in the research. Therefore, we specifically sought overarching contrasts, which is to say at a higher level of abstraction than how the collaboration included, for instance, different activities. Moreover, we decided to select labels for these themes that represent the main contrasts in the educators' experiences. This resulted in three contrasts in the educators' experiences: their own position; the position of the researcher; and the research itself.

Working backward from these three contrasts, we have analyzed the researcher's logbook to supplement this retrospective account. We examined the logbook seeking indications that were informative of either the events described in the group interview or the contrasts as reflected on in the group interview. Informative indications were explicitly understood as corroborating as well as disconfirming events or contrasts as described in the group interview. When the logbook provided a different perspective or alternative understanding, we mention this explicitly in the results.

## Results

In this section, we describe the educators' experiences in terms of three contrasts: the position of the educators as agents; the position of the researcher as learner; and the research itself as integrated. We present excerpts from the group interview and from the logbook as illustrations. In the excerpts, "I" refers to the external interviewer, and "L", "M" and "J" to the names of the PhD researcher (i.e., Laura), and the two teacher educators (i.e., Marieke and Jantina) involved in the collaboration, respectively.

### *The educators' position: From being an instrument to being an agent*

In describing the division of labor, educator Marieke starts to compare this intervention research project to other research projects in which she has been involved.

- 1 M But, in that sense, I think it is incomparable with other studies I have experienced as a  
2 teacher educator. Because then I had the feeling, if I say it bluntly, that people come,  
3 who collect data. From the student teachers, and some from me. They need me for  
4 that. And then they say "Well, thanks!" and they go back, and do their thing. And then  
5 there is a thesis and you're being thanked, but it all goes back to that world.
- 6 I Hmm
- 7 M And one day someone would say: "Yes, it's important, you should read it all". I'm  
8 painting a negative picture here. "But, you should [be] reading it and then it's such a  
9 shame that those educators show so little involvement in the research community.  
10 They really don't practice it." To the extent that it gets under your skin, in the sense  
11 that your existence [the research community] is justified by us!  
12 And if we did not do our jobs, you would not be able to do research into them. But the  
13 data is taken to the other world. And now, it was like, we had a continuous interaction  
14 with the research perspective, so to speak, and not the data analysis, because the poor  
15 thing still has to do that.
- 16 L [laughs]
- 17 M ... Which I think is a hell of a job. But now, because it was so close, I really had the  
18 feeling that this is ours too. And this benefits our practice. We also had influence  
19 quickly.
- 20 I And "This is ours too". What do you mean by this?
- 21 M Well, the research
- 22 J Yes
- 23 M While I normally felt more like, oh, they need us. Always really friendly, and [stating]  
24 why it's important. Well, we're not the most horrid teacher educators. So, of course, we  
25 all want to cooperate [in research]. But, what I just portrayed, then it would go away.  
26 And this irritates me the most. We [teacher educators] should not meddle, so to speak,  
27 with the analyses, the meaning, because that would only confuse the research. Because  
28 that really requires a great deal of researcher knowledge, so to speak.  
29 That is also the reason why, but now we are drifting off topic, research in the teacher  
30 education program is not always received well. Because you have the feeling you can  
31 supply data.
- 32 J Yeah
- 33 M But you shouldn't embarrass yourself by saying something about it, because you really  
34 need to acquire a whole new role for that. And now I think that, I can't say that ... it's  
35 not my job to do the whole analysis. But now my opinion is being heard. My expertise  
36 resulting from my experience, and that ... that I do find a lot more enjoyable. And that  
37 has increased my enthusiasm for research.

In this excerpt, Marieke mentions how her previous experiences with research differ from her experience in this formative intervention. By stating “they need me for that” (lines 3-4) and “you can supply data” (lines 30-31) she indicates that in other studies she felt like a gatekeeper of “data”. Also, having the feeling that she should not “meddle with the analysis” (lines 26-27) reflects a characterization of a position of instrumentality: she felt like a tool for the researcher. By mentioning that “the data is taken to the other world” (lines 12-13), she indicates that she experiences a gap between her world, where researchers collect data, and another world where researchers analyze the data, but where she cannot, or does not, visit.

She contrasts this common way of being involved in research with this study, in which “my opinion is being heard, my expertise resulting from my experience” (lines 35-36). Instead of the data being taken to the other world there was “continuous interaction with the research perspective” (lines 13-14).

In describing her experiences in this study, she indicates that the research is “ours too”, which the other educator corroborates. This expression of possession has been described in the literature as ownership (Kirk & MacDonald, 2001). She also expressed the relief that they as educators “had influence quickly” (line 18). This indicates that there was room for educators to exert influence, which they, in turn, did. This has been referred to as agency (Lasky, 2005; Sannino, 2010). Combining these aspects, the educators’ position can be described as that of an agent, as opposed to that of an instrument.

The researcher logbook also describes various instances of teacher educators’ agency right from the start of the collaboration. On the other hand, an indication of ownership of the research does not appear in the logbook until halfway through October. The logbook entry on October 13 reads:

“But, the fact that Marieke addressed this issue explicitly in class means that she has understood it profoundly [...] and that she is now on board to address it. She feels owner of that part now (or so it appears). So that is a good thing!”

Similarly, halfway through the year of collaboration, there are some logbook entries that describe Jantina’s desire to explore the main theoretical concepts in more detail. In the end interview Jantina states this questioning was out of interest, which can also be seen as a sign of ownership.

### ***The researcher’s position: From teacher to learner***

The teacher educators also commented on the position taken by the researcher in this project. They discuss what the researcher actually did in collaboratively preparing the next class:

- 1 M And if it was necessary ... but not in the sense of: “Hold on, now you should do this”,  
 2 but more like “How can I contribute?” And a question every once and a while. But it  
 3 was a real conversation among the three of us, in my perception. In which we, as  
 4 teacher educators, thought about the next meeting most intensely. But it was a three-  
 5 way conversation. It was not that we were talking and you [Laura] were only observing.  
 6 I That might be different for you [Laura]?  
 7 L No, not really

Here, the educators indicate that the researcher did not tell them what they “should do”, but asked questions and sought to contribute to the ongoing conversation. Note that the educator adds “if it was

necessary” (line 1). This indicates that there were also instances in which it was not necessary for the researcher to be involved. This again signals the aforementioned position of ownership and agency, which combined with the reference to “a three-way conversation” (line 4) indicates that the researcher’s position was not experienced as one of control or one of distance.

In the logbook on October 13 the researcher describes her intentions of engaging in these conversations:

“... If I want to work on a certain theory or hypothesis, I mention that idea first as though it is something new for me, or something worthwhile. I ask the teacher educators what they think and also adjust my thinking to what they say. If they perceive this as something being worthwhile, the issue will resurface. Sometime I also just ask what they think about a certain issue. Knowing their argumentation also helps in interpreting and then they know it is something I am interested in.”

For the researcher, asking questions was a way to explicate discontinuities (cf. Akkerman & Bakker, 2011) that occurred between her and the educators. Explicating such discontinuities could, in turn, trigger innovative attempts to change educational practice, if the educators also perceived the issue as “worthwhile”.

In the group interview, it became apparent that the researcher’s position had changed. The next excerpt describes the researcher’s reaction to the educators’ invitation to share more of her thinking, since they had the feeling the researcher did not always speak her mind:

- 1 L I do recall a certain moment when Jantina asked me: Are we doing the right thing(s)? At  
2 that moment I thought: aha. [Before] I really had a feeling of, Am I allowed to? That  
3 sounds strange maybe, but I was at odds with myself about that. But then I thought, I  
4 am not only allowed, I am also expected [to contribute]. [...] That’s why I’m there. And  
5 then I tried to do that more and more.
- 6 J Okay! [surprised]
- 7 M I think we did, I don’t know if that was very explicit, but we did say that. We want  
8 exactly that.
- 9 J Yes
- 10 M That you give your opinion, or ask questions. Not that we’d then do it immediately. But  
11 the fact that you have less experience or a different opinion, we get that. I think both of  
12 us, in different ways, raised the issue. As in: “If you are present: a) are you satisfied with  
13 it? And b) you should not keep quiet for the wrong reasons, if you’re worried about  
14 stepping on our toes. Because, that’s just it: we want to hear your opinion. And then we  
15 will see what we do with it. Especially [since that presents] another perspective. That’s  
16 the added value.
- 17 L Before that, I had the feeling, a class meeting, what is that really? Later on I started to  
18 realize: I think this [theory] fits with this [pedagogy in a class meeting]. Because I was  
19 very insecure about that.
- 20 I Do you mean in preparatory meetings of classes?
- 21 L Yes, exactly.
- 22 J At a certain moment you said, I really liked that ... [when] We were discussing: “We  
23 could do this and we could do that.” And you said: “Yeah, the theory says ...” And then  
24 I thought, oh yes! We work according to the book, so to speak.
- 25 L At a certain moment I definitely started recognizing that.
- 26 J Yes
- 27 L What was happening, what the theory says about it, and how I could, in my own words  
28 ... yes

- 29 J I liked that, because that's when I noticed that what we're doing in the classroom has a  
30 theoretical name. It can be perceived from a theoretical perspective.

The researcher explains how she had not been very dominant at first, as she felt insecure about her knowledge of the specific context. Gradually, both the researcher and the educators had the feeling that the researcher's contribution would be valuable, and the educators invited the researcher to contribute more. Yet, although they educator say "we want to hear your opinion" (line 14), they state this without committing themselves to comply with it. So, the educators experienced the researcher's expertise to be a potential added value, yet equal to their own, which has been described as the recognition of a shared problem space (Akkerman & Bakker, 2011).

In the last group interview excerpt the researcher explains how much she had valued the collaboration for her professional development. Afterwards, the interviewer asks the teacher educators to respond to these comments, and one of them singles out what makes the position of the researcher so special, especially compared to other researchers she had experienced.

- 1 I You said that you had changed in that respect?  
2 L [...] I really wanted to do it [the intervention] in this way, because I thought it would  
3 make the intervention better. If I could profit from your expertise. And I had thought,  
4 mainly from a research perspective; that will make my research better. Or that will make  
5 the designed pedagogy better ... well, it's hard to say. In the end, it's just like with you  
6 [both educators] and your increased awareness of pedagogy ... I experienced that with  
7 research very intensively. Because you asked questions about it and it was the topic of  
8 our discussions, I became much more aware of what my research really comprises. And  
9 why do I do the things the way I want to do them. [...] As in, what do I think is  
10 important about [research designs]? And what I intuitively thought, in the sense of, [I  
11 think] it is much better if I collaborate more intensively with you, than what is said in  
12 the books, so to speak. That was the case, but in far more ways than I had imagined.  
13 Because it also applies to myself as a researcher and aspects of my research. [...] More as  
14 in: I had the feeling "I need you [the educators]. But that I would learn so much in the  
15 process ..."  
16 I That you hadn't imagined?  
17 L No, that was really new. [...]  
18 I Does that surprise you? Or ...?  
19 J Well, not surprise in the sense that I did not expect it. But I had just not thought about  
20 it at all. That that layer also exists.  
21 M Well, we talked about this of course. [...] Maybe not to this degree, not like this ... at  
22 any rate, you [Laura] haven't made it explicit in this way before. And subconsciously I  
23 think that that might be the reason why I am so enthusiastic. Because this is, even  
24 though not as explicit, I feel that this is, what you just mentioned, this is what I think so  
25 valuable about this project. While, otherwise when researchers collaborate, they teach  
26 you, or they do something and they keep it to themselves. While the precise reason why  
27 I like my work is that I see people learn. [...] And you sense that about Laura. That she  
28 went through a tremendous development in a year. [...] So, that must have triggered a  
29 great deal of enthusiasm and satisfaction subconsciously. I really appreciate that. But it's  
30 difficult [to say] if that was explicit ...

Here we see that the researcher not only sees herself as learning, but she also shows that learning to the teacher educators, which is clearly different from the distant and objective researcher who knows the

solution and the road to it in advance. For the educators, showing this learning is important, as can be read on lines 25-26: “otherwise when researchers collaborate, they teach you or they do something and they keep it to themselves”. Hence, showing learning not only induced enthusiasm for the teacher educators, as “the precise reason why I like my work is that I see people learn” (line 26-27), but also afforded teacher educators to experience that they were not being taught, but being invited.

***The research: From research as separate to research as integrated***

The discussions in the preparatory and evaluation meetings were not confined to discussing teaching or the pedagogies or interventions, but also included the research. The following excerpt narrates how the mirror data (i.e., the ethnographic materials from the classroom and researcher observations) was discussed:

- 1 L Our perceptions of and opinions on student teachers differed at times.  
 2 I Can you say something more about that? Just now, you mentioned an example where  
 3 you did not agree with ...  
 4 L At the start ... I think even in the introduction week. Let me see if I can recall ....  
 5 I But did it occur more often, that you had different perceptions or different  
 6 interpretations?  
 7 M Especially interpretations.  
 8 L Yes.  
 9 M I think more in the beginning than later. In any case you're more ...I don't know why  
 10 that's the case. I can't recall the exact moment, but I do recall that you, Laura, were  
 11 shocked by the little energy the students devoted in working on [an assignment] ... we  
 12 had given the instruction, the input and they were supposed to apply it. Well, they did  
 13 do something, but it was window-dressing more than anything else. [...] And then Laura  
 14 said: “So little meaning-oriented!” These are my words, I don't know if I do yours  
 15 justice now. While we [the educators] were thinking, and perhaps I most of all, as I have  
 16 the most experience in the education program, well, the fact that they're doing  
 17 something at all, counts for something. Because it was the last part of the meeting in a  
 18 the particular phase of their development ... [...] People give different meaning to  
 19 things. In a sense, I even considered it [the students' behavior] to be an added bonus, so  
 20 to speak. I've also seen differently.  
 21 J [laughs]  
 22 M Yes, but then you still don't know... Neither of the two [interpretations] is the truth of  
 23 course. Because my interpretation is also biased. [...] Well, that is an example of what  
 24 happened and how we each interpreted it.

This excerpt shows how the educators perceive the discussions of the mirror data that were part of every preparatory and evaluation meeting. The remark about this being an example (lines 23-24) indicates that this was part of their normal repertoire. The discussion about the differing opinions of the researcher and teacher educators is informative about the two positions that have been discussed previously.<sup>6</sup> What this

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<sup>6</sup> To be complete, this is how we would interpret this excerpt in terms of the first two positions. By virtue of their positions as active agents, the teacher educators commented on the observations and mirror data introduced by the researcher. The interpretation of these “mirrors” was not uniform, at least not in the beginning (lines 7-9). Yet, by virtue of the researcher's position as learner, the conclusion on these differing opinions is by no means given. As one of the educators says on lines 22-23: “Neither of the two is the truth of course”. Both the researcher and the

excerpt adds, is that these positions were not confined to the intervention or to teaching, but included mirror data interpretation.

The design of the research was also discussed. The next excerpt of the group interview describes Jantina's critical questions about the research.

- 1 J Well, I thought it was interesting to... I don't think that was insecurity or something,  
2 but just that I found it fascinating what was going to be written exactly [in the  
3 dissertation].
- 4 I Conceptually?
- 5 J Yes! What is it? How does it compare to what we are doing? [...]
- 6 M Yes, that's true. Also a lot more questions of methodological nature. [...] In the sense of,  
7 of, are you correct in saying this?
- 8 J Yes, I thought it was.... Well yes, [I was wondering] what is she actually doing with us? I  
9 found it ... I had the feeling "What would the book [thesis] look like?" This is naturally  
10 the case because you are really involved in research. And I was really thinking about  
11 what other research approaches exist next to the experimental? What are those  
12 alternative methods? Since I expected you [Laura] to interview us in between, next to  
13 observing us.
- 14 L Okay [surprised].
- 15 J But you did not do that, so well....
- 16 I You taped your conversations?
- 17 L Yes.
- 18 J Yes, but one can hardly ... you can tape a conversation, but you do not know  
19 everything that goes on in my head. So I thought she would stalk me as an  
20 anthropologist. But that ...
- 21 I Why did you think that?
- 22 J Well, maybe based on my background; I studied developmental economy. There you  
23 have more people with anthropological roots.
- 24 I Yeah, but you also said that [in that way] she could discover all of what you thought.  
25 That that would be worthwhile to ...
- 26 J Um ..... perhaps after all, as we were discussing these things with three of us, this  
27 [thinking] also surfaces. You don't need to interview someone for that, as in: Why do  
28 you do this or that? And the funny thing is that since you are just ordinarily discussing it,  
29 you do not have the feeling of being actively researched.
- 29 I No, yes.
- 30 J So ...
- 31 I Because that ...
- 32 M Can I also ...?
- 33 I Yes.
- 34 M What we're talking about is, if I had to put it into words now, it has become much  
35 clearer, for all of us, from which ... paradigm is perhaps a big word ... from which  
36 research tradition [we operate] or what our perspective on research might be.

This excerpt resonates the interest and expectations the educators had, and showed in the methodology of the research. This interest was partly about research in general (line 11): "What other research approaches exist next to the experimental?" Jantina also considered the more specific claims the researcher would make about their teaching and their students, and on what grounds that would be based. Discussing these issue made that the educators did not "have the feeling of being actively researched" (line 27).

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educators acknowledge that different perspectives exist. The educator comments that her interpretation is also biased (line 23), indicating that she considers the researcher's perspective to be colored as well.

Consequently, the educators argue that it has become clearer “for all of us” (line 35), including the researcher, what their stance on research and research methodology might be.

The researcher mentions in the end interview how much she valued these questions and discussions. Her logbook reveals that these questions triggered doubts at first. For instance, when educators asked questions about the concepts used in the research. The logbook entry in response to educators’ questions about one of the central concepts of the research (i.e., deliberate practice) on September 21 reads:

“By breaking deliberate practice down into pieces, the whole idea behind it disappears or seems less powerful. Is this what research is about? That is what Marieke always says and what she dislikes most about research. How can I prevent this from happening?”

Gradually, these doubts lessened and in the last months of the collaboration such questions mainly resulted in deliberations about research methodology as reflected in, for instance, this chapter.

## **Conclusion and discussion**

### *Three contrasts*

New research approaches explicitly value educators’ and other practitioners’ engagement in conducting intervention research in educational practice. Often, this stems from the recognition that this engagement will benefit educational practice. We argued that our community would also benefit from an increased understanding of the impact of such collaboration on research. To that end, we explored teacher educators’ experiences of a year-long formative intervention. Our analysis revealed three main contrasts, all of which the teacher educators experience as being consequential for their participation in the research.

The first reflection related to how the teacher educators perceived *their own position*. The educators describe this position as one of agency and ownership, coupled with recognition of their expertise. They experienced this as being in sharp contrast with their position as instrument or data-gatekeeper in other research designs in which they had been involved. As educator agency and ownership are the reason why formative interventions and similar approaches have been developed, this finding does not come as a surprise. This alternative position has also been referred to as a shift from educators being a user of knowledge to a creator of knowledge (Meijer, Meirink, Lockhorst, & Oolbekkink-Marchand, 2012), or the shift from being an *object* to being an *agent* of investigation (Wagner, 1997). Nonetheless, logbook entries indicate that the educators did not express ownership from the start, whereas agency was encountered in the data from the beginning. This gradual development of ownership seems plausible, as educator ownership is assumed to develop in interaction and as a result of agency (Kirk & MacDonald, 2001) in working on a shared problem.

Notwithstanding the educators’ ownership and agency, there was still a division of labor: the educators were primarily responsible for and focused on teaching, whereas the researcher was responsible for and focused on the research. As such, this suggests that when the different expertise of educators and

researchers alike, is valued equally, these differences can be exploited. This appreciation for diversity, even in long-term collaborations, concurs with the findings of Akkerman, Admiraal and Simons (2012) that collaborations can profit from maintaining diversity in terms of expertise, when coupled with a sense of sameness.

Secondly, the *position of the researcher* was experienced as different from what the educators normally encountered. This position was one that explicitly involves learning. Although development is often the aim of research approaches that value educator engagement, this mostly refers to educator learning and development (Cobb, Zhao, & Dean, 2009; Penuel et al., 2007), or the development of theory (Gravemeijer & Cobb, 2006). Although recognized in other fields (e.g., in collaborative ethnography, Lassiter, 2008), in the literature on intervention research in education there is little recognition that the researcher is developing or learning as well, nor recognition for the impact that this learning can have on educators.

This points to the interdependency of the positions of educators and researchers in research designs, which contrasts with the popular discourse in which researchers “give” educators agency and ownership. From our analysis it appears that the position the researcher assumes is also important in this process and that, sharing doubt(s) and showing learning, can actually foster educators’ active involvement. As this mechanism has been described in other studies focusing on collaboration between researchers and teachers (Meijer et al., 2012), we postulate that this mechanism might apply to several intervention research approaches, described in the introduction, that explicitly seek educators’ engagement.

Lastly, *the research* was experienced as being integrated. This implies that the involvement of the educators not only included the implementation, the design and evaluation of the intervention, but it also included the research. More so, the research was interwoven with the other collaborative activities instead of being a separate element. This prevented a feeling of “being researched”, or social desirability in the teacher educators’ actions. Besides, the experience of research as an integrated part of everyday practice made the educators adopt the research perspective, and also gave way to both the educators and the researcher to further developing their perspective on research. These are goals that are normally associated with the goals of the teacher research movement (Cochran-Smith & Lytle, 1999). Our results indicate that the same goals can be realized when educators are involved in a formative intervention. In turn, this enables the researcher to benefit from the educators’ expertise in terms of their interpretation of the object of research as well (cf. Kershner & Hargreaves, 2012), which has been described as reintegrating the negotiated meaning by other participatory approaches (e.g., Almekinders et al., 2009; Lassiter, 2008).

Although both the educators and the researcher were quite positive about the positions they took in this formative intervention project, arriving at these positions was not effortless. Despite the fact that formative interventions are deliberately designed to afford educator agency, the researcher in this study initially expressed dilemmas in her logbook. These dilemmas can be seen as inherent to research designs seeking far-reaching collaboration with educators (Akkerman et al., 2013; de Kleijn & Bronkhorst, 2013) and essentially resemble the questions all interventionists need to ask themselves according to Blackler (2011). Among these are: “Should I concentrate on promoting the agenda of my client, or work from my

own agenda? Should I only act on the basis of certain knowledge, or act on the basis of a hunch? [...] Should I concentrate on maintaining a rapport with my clients, or confront them about our differences?” (p. 733). We agree that such questions are important to ask ourselves as researchers if and when we seek to engage (and benefit from) educators in our research. Moreover, from our analysis it appears that sharing these dilemmas can in fact strengthen educators’ engagement.

The three contrasts are in line with the basic principles of formative interventions and similar intervention research approaches. What is striking, however, is how much the chosen approach impacts the way the teacher educators relate to the researcher and the research. In talking about the collaboration, it becomes clear that educators perceived the study as a partnership in which they felt appreciated. This in turn triggered enthusiasm for the study and this research approach more generally. As educators’ engagement is crucial, we think it is worthwhile to be aware of this more consciously as a researcher: intervention research is not only a matter of research design, but also a matter of researcher position and the relationship established with the educators.

### ***Limitations***

We should note that although the underlying principles of our research design are similar to formative intervention research literature, there are also ways in which our study is different. For one, the initiation of the research came primarily from the researcher and her research question and, to a lesser extent, from a problematic situation faced by educators. This could be why educator ownership took some time to develop. Yet, our results indicate that under these circumstances, agency and ownership can develop, given the design of the collaboration and the position assumed by the researcher. Also, in this particular situation, the researcher relied on explicating discontinuities by questioning and doubting, to trigger the change process and the developing understanding. Lastly, not all those involved were active participants in the formative intervention, as the student teachers’ perspective was only represented by the mirror data. Although students’ perspective is not incorporated often in research (Könings et al., 2005), we propose to also seek their involvement in future formative interventions.

In terms of the data sources analyzed in this study, we should mention that although a group interview format was chosen at the request of the teacher educators, it may be that some issues were not explicitly addressed due to the company of and potential influence by the researchers. Moreover, the longitudinal data that traces the process as it emerged was confined to the researcher’s logbook, and may thus under represent the educators’ perspective.

### ***Discussion and implications for research quality***

In describing their experiences the teacher educators also describe the consequences of the chosen approach, which we view as critical issues for research quality. In the past, collaborative intervention research approaches have been met with concerns about research quality (Kelly, 2004), as the reduced researcher control begs the question of whether the research can be replicated, and if the results do not

become (too) subjective. In response, many scholars invoked the increased relevance of the research as sufficient justification for seeking educator involvement (Almekinders et al., 2009).

To explore this issue, we interpret each of the contrasts against central quality concerns. As different frameworks for research quality exist, we draw on the seminal work of Guba (1981), who discerned four general quality concerns in social scientific research, irrespective of the paradigm in which a researcher operates: truth value, applicability, consistency and neutrality. *Truth value*, often referred to as internal validity or credibility, concerns the confidence in the “truth” of the findings. *Applicability*, often referred to as external validity, generalizability or transferability, concerns the extent to which the findings may be applicable to other settings. *Consistency*, often referred to as reliability or dependability, concerns the consistency of the methods used. *Neutrality*, often referred to as objectivity or confirmability, concerns the degree to which the findings are free from various sorts of bias of the researcher.

First, the position of the educators was one of ownership and agency. Agency is related to the educators’ expertise being incorporated in the research. New perspectives on knowledge indicate that this multi-perspectiveness of the research increases the truth value, as the results have been corroborated by those we study and alternative explanations are ruled out (Tracy, 2010). As such, the research becomes embedded in existing practice, which can be seen as a sign that the results gathered have a high truth value.

Second, the teacher educators indicated that the researcher’s learning position stimulated enthusiasm and a positive relationship. Naturally, this has to do with research ethics, which can be considered a quality criterion in itself (Tracy, 2010). Additionally, the fact that there was an open relation between the researcher and the teacher educators also enabled everyone to speak their mind, which is a way to assure the truth value of the research. The researcher’s position can then be seen as a precondition for the active position of the teacher educators, in that the learning and doubting attitude of the researcher gives room to educator agency. Yet, this also has to do with neutrality, or undoing the potential harm of a researcher’s bias. Reflexivity, or doubt, has been advanced as an important strategy in this respect (Savin-Baden & Howell Major, 2010), but our results indicate that sharing these doubts might be even more powerful.

Lastly, the integrated nature of the research also appears to be relevant for maintaining quality. Experiencing the research as integrated within existing activities, instead of a separate and additional activity, gave way to the experience of it not being researched actively, as well as developing a perspective on the content and methodology of the particular research project and research in general. The feeling of not being researched is an important indication that social desirability is not in play, adding to the truth value, as well as applicability to other contexts. In addition, the integration of research makes research a topic of conversation, inviting educators to comment on the theoretical and methodological assumptions, as well as the ongoing analysis. This reintegration of negotiated meaning makes the findings more credible (relating to truth value) from the point of view of research, as well as educational practice. It reduces the chance of having the researcher’s bias (by virtue of a preselected theoretical framework, instruments and

analysis strategy) influence the results, which has been described as harming the neutrality of research (Guba, 1981).

In summary, the educators indicate that this type of collaboration might trigger several processes (enthusiasm, involvement, participation) that, in turn, benefit the truth value, neutrality and, to some extent, the applicability of the research. Naturally, the fact that the research and the way of collaboration were emergent and context-dependent entails that the results cannot be replicated exactly, which, in turn implies that research consistency is more difficult to assess. We do not propose to ignore this factor, but do contend that there might be other ways to assure consistency in methods besides researcher control, such as keeping an audit trail (Akkerman et al., 2008), or using overlapping instruments (Guba, 1981).

### ***Final remarks***

To conclude, even though some researchers downplay educators' involvement in their research in light of perceived threats to research quality and others stress that the increased relevance of their research justifies potentially reduced rigor, our study offers a different perspective. In contrast to both stances, our findings add to the debate, by indicating that collaborating with educators can have several advantages in terms of maintaining rigor, thereby adding to the quality of research. As such, collaboration in formative intervention research can be consequential in a positive sense for *both* research and practice. By explicating the experiences of those involved in formative intervention research, in terms of the positions of educator as agent, a position of researcher as learner and research as integrated, and interpreting these against known quality issues, we pertain that we have offered an increased understanding of the significances of collaboration with educators on research and research quality.

### ***Acknowledgements***

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## Chapter 6 Conflicting cultures of teaching and learning<sup>7</sup>

### Abstract

Student teachers' resistance to teacher education pedagogies is often understood as a lack of quality of the student teacher and/or attributed to his placement school, and such resistance is expected to impede learning. In contrast, in this study we combine alternative perspectives that suggest resistance is interactive in nature, resulting from differences between cultures of learning, and can potentially have constructive outcomes. We explored the implications of this alternative understanding of resistance for teacher education, by engaging in a longitudinal analysis of two purposefully selected case studies of student teachers' resistance in a teacher education program with innovative pedagogies. Our analysis highlights the complexity of resistance and its various manifestations over time. Moreover, it draws attention to diverse ways in which student teachers can engage in resistance, and to ways in which educators can support student teachers in exploiting their resistance to benefit their learning.

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<sup>7</sup> This chapter is based on Bronkhorst, L. H., Meijer, P. C., Koster, B., Woldman, N. N. & Vermunt, J. D. (submitted). Student teachers' resistance to teacher education pedagogies.

## Introduction

In light of research that documented the limited effects of teacher education, researchers, policymakers and educators have been seeking alternative ways to prepare teachers for their profession (Darling-Hammond, 2006a). As a result, during the last two decades more innovative pedagogies, often drawing on notions of reflection, became widely used in teacher education in many countries around the world (cf. Loughran, 2002).

Yet, some student teachers fail to appreciate such innovative pedagogies, similar to lack of appreciation (other) students had for the “traditional” pedagogies they replaced. In the literature, there are some explorative studies examining student teachers’ discontent with the more innovative teacher education pedagogies, in particular those focusing on reflection (Gunn, 2010; Middleton, Abrams, & Seaman, 2011). This discontent is often conceptualized as *resistance*, which should be overcome for the student teachers’ benefit (e.g., Korthagen et al., 2001). This implies, implicitly or explicitly, that 1) resistance is a (lack of) quality of the student teacher himself, and also 2) that resistance is not only negative in its manifestation but also in its consequences, as it is assumed to impede learning.

Our case study of two student teachers’ resistance to the innovative pedagogies were developed in a formative intervention invites us to reconsider these two assumptions. In this study we conceptualize their resistance as *friction* (Vermunt & Verloop, 1999), which challenges us to perceive their expressions of this friction as the result of a difference between different learning cultures. In turn, this alternative conceptualization invites us to examine the different manifestations of resistance, some of which are not easily discerned. This also brings to light that the consequences of resisting should be seen as tentative, as explicating friction might also be (come) constructive.

To build this case, we first briefly describe how resistance has been described in the literature on teacher education, illustrating the two assumptions presented. Subsequently, we will summarize the literature that offers a different perspective and invoke this perspective to analyze the resistance of two student teachers to the pedagogies used in our teacher education program.

### ***Resistance as personal and destructive***

In research on education, arguably the most common understanding of resistance is as an oppositional act to something, that an individual or group disapproves or disagrees with (Sannino, 2010). Correspondingly, resistance and especially its manifestation tends to have a somewhat negative connotation in (research on) education, even though it is considered to be inevitable (Grossman et al., 2007).

In research into teacher education, student teachers’ discontent with and resistance to more traditional teacher education pedagogies has been described elaborately, as these pedagogies were considered to be irrelevant to everyday school practice (Korthagen et al., 2006). Korthagen and colleagues (2001) are among the few that explicitly acknowledge that student teachers in more innovative teacher education programs are also very likely to experience resistance to these innovative pedagogies. Many of

these pedagogies, often reflection-based and/or rooted in constructivist theories, aim to overcome existing conceptions of teaching and learning (cf. Loughran, 2002). As these pedagogies thus threaten existing knowledge and skills, they are very likely to incur resistance (Atherton, 1999).

Korthagen and colleagues (2001) discuss student teachers' resistance to reflection-based pedagogies as follows:

“Often *certain* student teachers will have severe difficulties with the actual use of reflection techniques. This has to do with [...] learning orientations. Internally oriented student teachers want to learn by reflecting on their experiences, and externally oriented student teachers want instructions and guidelines from the teacher educator. [...] This points to the need for a *careful strategy designed to make externally oriented students more internally oriented.*” (p. 228, emphasis added)

These authors appear to locate the source of the resistance in student teachers' learning orientations. Moreover, the proposed way of dealing with this is to deliberately and carefully change students' learning orientation, and as such, to overcome their resistance. Middleton, Abrams and Seaman (2011) seem to understand resistance similarly:

“Implications for teacher education include the need to more closely *guide and mentor new teachers into understanding* how reflective practices extend beyond their teacher training program into their professional careers. [...] This may be *particularly true* for interns in cooperating schools *where reflection is not so highly valued.*” (p. 74, emphasis added)

Again, there appears to be an understanding that student teachers' resistance should be overcome in light of the benefits of reflective practice. Moreover, these authors also explain student teachers' resistance by individual factors, in this case internships in schools where reflection is not so highly valued. This attribution of resistance to the student teacher and/or his school context implies that it is a personal quality, not affected by the context in which the resistance is encountered, in other words: the teacher education programs.

### ***Resistance as interactive and potentially constructive***

A review of studies on resistance in the domain of sociology draws attention to emerging discussions on how resistance can be understood differently (Hollander & Einwöhner, 2004). It raises the questions of *who* should be the one to identify a certain act as oppositional – thereby judging it as resistance – and whether the act should be *intended* as such.

Relating these issues to the assumptions about resistance in the teacher education literature, we could question if student teachers identify, let alone intend, their own expressions as resistance or as, for example, legitimate feedback for the teacher educator and the teacher education program. Gunn (2010) also finds that his student teachers' resistance mainly results from misunderstanding and frustration, and not from opposition. Moreover, often the teacher educator is the one who identifies and labels students' expressions as resistance, and determines it should be overcome. This reading of students' responses

could be questioned, especially in light of the uneven power in this relationship – which is inherent in education (Hoffman, 1999).

Building on this, resistance could also be understood as part of the context in which the resistance emerges. This transforms resistance from a misunderstanding on the part of the student teacher to the result of a incongruity between the student teacher and the teacher education program. This conception of resistance is similar to the notion of *friction*, as postulated by Vermunt and Verloop (1999). According to them, friction occurs when students' learning strategies are not compatible with the teachers' teaching strategies. This understanding does not locate resistance with the student, but in the interaction between the student and the learning environment in which the resistance is encountered. Moreover, Vermunt and Verloop also suggest that friction is not inherently destructive, but can also be potentially constructive, if it challenges students to move beyond their current abilities.

This constructive potential of resistance is supported by authors drawing on socio-cultural and/or cultural historical activity theory, who argue that resistance should not be seen as something that impedes learning, but as a form of participation in that learning (cf. Sannino, 2010). For example, Kindred argues that “resistance, despite its negative style of expression, is a purposive entry into a dialogic and potentially exploratory process” (1999, p. 218). Participation in an active dialogue about teaching and learning can be seen as necessary in order to learn (Diamondstone, 2002). In this way, resistance can be an early sign of agency of the learning process, which in turn, can be seen as necessary for continuous professional development (Engeström et al., 2012).

Combining these perspectives invites us to shift our understanding of student teacher resistance to the explication of friction, which is *interactive* and *potentially constructive* in nature. In this chapter, we draw on two case studies of student teachers to *explore the implications of this alternative understanding of resistance*. Our longitudinal analysis of these cases affords an exploration over time of the different manifestations of resistance in relation to its origin(s). Moreover, it challenges us to conceive of ways in which students and educators can deal with resistance, which are not aimed at overcoming it, but at exploiting it to further benefit our students' learning.

## **Methods**

### ***Context of the study***

Our study was conducted in a one-year, post-graduate teacher education program, offered by a large university. It has 18 different subject-matter specific tracks, as teaching licenses for secondary education are subject-matter specific in the Netherlands, wherein this study was conducted. Students enter the program after obtaining a subject-specific master's degree (e.g., mathematics, History).

The teacher education program's philosophy has been described as realistic (Korthagen et al., 2001), in that it takes student teachers' teaching experiences as a starting point for learning and actively seeks to integrate those experiences with theories in teacher education classes. To afford this integration

of theory and practice, about half of the program is situated in school, either as an internship or as a paid job. Practically, this entails that on Monday and Tuesday student teachers have classes at university. The rest of the week is assigned to studying and teaching practice. This teaching practice is divided into two internships at different secondary schools. Both internships last the entire semester.

As part of a larger study, the curriculum of the two main courses of the program was re-designed throughout the course of the year in close collaboration with the educators teaching these courses to foster student teachers' meaning-oriented learning and deliberate practice (Bronkhorst et al., in preparation). Design principles to support this re-design were developed in prior research (Bronkhorst et al., 2011). These design principles did not prescribe completely new pedagogies, but integrated and extended ideas on the pedagogy of teacher education previously scattered in the literature in several ways. The re-designed curriculum had a strong focus on having students' explicate their theories of practice (i.e., meaning-oriented learning) and on having them proactively engage in learning to teach (i.e., deliberate practice). The curriculum incorporated adaptations of a variety of well-known pedagogies used in teacher education programs advocating reflection and constructivist ways of teaching, such as logbooks, teaching autobiographies, and role plays, as well as several collaborative work formats, referred to as "activating pedagogies" in Dutch (e.g., think, pair, share).

### *Participants*

Two student teachers in the larger study were purposefully selected for the current analysis as they explicitly voiced resistance to the teacher education pedagogies. They shared the same supervisor, who was an experienced teacher educator, who had worked in the program for about ten years. We refer to her as Mandy (pseudonym). Both students were female History student teachers, in their early twenties, without prior teaching experience, who entered the program immediately after competing their master's degree in History at the same university. Their teaching practice was organized as two internships. We will refer to them as Carol and Sabrina (pseudonyms).

### *Data sources*

We used two data sources for this study. The first is an *electronic portfolio*, which the student teachers use to document evidence for their competence as a teacher in six domains, based on national requirements. These six domains are referred to as "roles" within the program. The role "End-responsible for own growth" is particularly relevant for this study, as it is traditionally intimately connected to students' views on their own learning and development, as well as the teacher education pedagogy.

Additionally, all student teachers have four formal *supervision meetings* with their institute supervisor through the year. These conversations serve to trace student teachers' development backward and to look forward, towards meeting the program's end terms. In most conversations the accompanying portfolio text is used as a starting point. One conversation is organized as paired conversation for practical reasons. Carol and Sabrina signed up for the same conversation, but there are individual portfolio texts that

accompany this conversation. Table 6.1 details each portfolio conversation. Verbatim transcriptions of their supervision conversations are our second data source.

Table 6.1. *Characteristics of the different portfolio conversations*

Conversation name	Scheduling	Participants	Accompanying portfolio texts
Introduction	After 2 days in the program	Individual student teacher and educator	No
Start portfolio	After six weeks in the program	Two student teachers and educator	Yes
Halfway portfolio	At the end of the first semester	Individual student teacher and educator	Yes
Final portfolio	At the end of the second and final semester	Individual student teacher and educator	Yes

### *Analysis*

As we sought to explore an alternative understanding of resistance, we used grounded theory (Beth et al., 2005) to analyze the data. Grounded theory stresses the non-linear character of analyzing data and advances an iterative process between the data and conceptual categories. In the current analysis, these iterations took the following shape.

We conducted an open content analysis of both data sources. First, we segmented the data, selecting fragments that concerned the student teachers' evaluation of the program's pedagogies or experiences of friction that resulted from it. Subsequently, we coded for the object of the resistance (*what* was being resisted) as well as the nature of the resistance (*how* it became manifest) as well as how they changed over time. This served as a basis for creating two narrative case descriptions of the student teachers' resistance, which we felt captured the interactive nature of the object and the nature of the resistance better than discrete categories (cf. Maxwell, 2004a). These narrative case descriptions are presented in the results section.

Subsequently, we compared our initial findings with our theoretical framework on resistance in teacher education, including our understanding of resistance as interactive and potentially constructive. In this process, similarities, but also differences between the two student teachers surfaced. A further analysis of the data was needed to explore these differences, which we were able to trace back to literature. As there is very little theory explaining such differences, this last step of the analysis in fact already constitutes our discussion, and these interpretations are presented as explorative.

Different authors have cautioned to retain a position of relative neutrality in the first step of grounded theory analysis in order to describe and understand the data in more than one way (Beth et al., 2005). We decided to address this issue by having both an insider (i.e. the researcher that conducted the

formative intervention) and a relative outsider conduct this part of the analysis and discuss their findings until they had reached agreement. We present elaborative quotes from both data sources in the results section so that readers themselves can verify our inferences.

## **Findings**

We present our description and analysis of the two cases subsequently. In the transcripts of the conversations, M refers to supervisor Mandy, C refers to student teacher Carol, and S refers to student teacher Sabrina.

### *Carol*

After two and a half days in the program, Carol describes her first experiences in the program as “back to high school”. She believes that the pedagogies employed do not match her “style of learning”. Her supervisor Mandy tries to explore this issue in more detail. Carol responds:

- C     Those work formats! Then you have to think about what you think about something again, then you have to write it down, again, and afterwards share out again...all of that I personally find....a lot of thin air about the same. Thus, putting it bluntly
- M     Yes, not, that's quite all right. [...] Do I understand correctly that you also say: “well, it can be a lot of the same or too much repetition?”
- C     Yes, well yes. It's like: “First write it down for yourself, then share with one or two others and then share out for the group.” Which gives me the feeling: “Now we should have completely dwelled over the topic.” And for me it would be... I would understand it a lot quicker, so to say. I don't necessarily denounce it, because it also inspires me in ways. For what I could do in my classroom. And it might work very well for others. But yes, I have determined for myself: I don't like it, but I'll have to.

Carol explicitly indicates that she experiences friction. This is not only apparent in what she says, but also in her choice of words, such as: “a lot of thin air” and “dwelled over”. In saying “I don't like it, but I'll have to” she expresses a lack of agency: she feels she will have to adjust to this new environment.

The supervisor indicates that such friction is not new to her and confirms that adjustment might be necessary. She adds that, even though the two and a half day she has experienced so far is representative for how the remainder of the program is purposefully designed, there are possibilities for Carol to adjust her learning environment, and more specifically her portfolio, to her preferences.

The supervisor invites Carol to consider the potential benefits of the pedagogies. Carol understands the potential benefits of the pedagogies used in the program to be: becoming aware of “what you know, want and can” in a way that is very difficult to achieve otherwise. This is in line with arguments that have been used in the literature and the teacher education program's philosophy to justify such pedagogies (cf. Korthagen et al., 2001). Yet, it appears that for Carol these benefits do not outweigh the friction she experiences.

After six weeks in the program, Carol's first portfolio text is more elaborate and more explicit as to the friction she experiences, what she sees as its causes and her resolutions for dealing with it, as this excerpt illustrates:

“For me personally, a few (Socratic) dialogues are sufficient to reflect on my own growth, but that will not suffice for this program. As such, I was surprised my parents were not invited for a teacher-parent conference.

What I do well in this role, is planning and setting goals for myself, in a less explicit and more unconscious way than in writing. That won't be of much help. That ties into exactly what I find so difficult with this role: writing down what I want, how I will achieve that, how I will check if I indeed accomplished it, etcetera etcetera.

My goal is to not become too dependent on this program's way, but keep my own style. [...] For me, the portfolio is only a means to show my supervisors this process, as mind reading is still impossible. [...] How I wish to achieve this, is not completely clear to me. I think this will require a tacit, unwritten, invisible and un-testable process.”

Carol contrasts what she knows she needs in order to learn with what the program requires her to do. Using the words “not suffice” and “that won't be of much help” she indicates that what the program requires in this respect is different from what she needs, as she feels she is already good at directing her own learning. In general, Carol relates her friction to the degree of anticipatory reflection and written explication of learning that she feels is required in this program, although she actually supports the general idea of being responsible for her own growth.

As such, her goal is to keep her own style while, in some way, dealing with the programs' pedagogies. In claiming that she expects this to require “a tacit, unwritten, invisible and un-testable process” she explicitly challenges the conception of learning the program promotes. All in all, the contrasts she uses, the choice of words and the “jokes” about a parent-teacher conference and mind-reading, are explicit signs of friction.

During the start portfolio conversation, Carol expresses her friction at her supervisor's initiative:

M And do I understand correctly that if I, or we from the program, try to stimulate other ways...If I suggest: “Well, you could do this in a more structured way, or in a different way”...that irritates you?

C Yes, it makes me think: “Well, so far this has always worked for me”. Look, I am not against trying, but I do have the feeling: “I just don't think this is the way it works for me.”

M No, no. I read somewhere [in your portfolio] “I have a style and I do not want my style to...My style works for me and I do not want to lose it”. So to speak.

C No, I don't want to lose it.

M Well no, that seems okay, I think that's justified. [...] How you've described it. I did not take it as personal criticism, but I did think: do you feel that we, whoever we are, the program, claim that your way of learning is not okay?

C No, that's not how I feel. But at times I do feel I am not taken seriously. All of us have master's [degrees] and then it's back to high school where you are doing these stupid assignments. In writing everything down. That gives me the feeling: “Come on!” Such a book, last year we would have read it in one or two week and have written a good review

about it. But here you just read one little chapter and just... Yes, that gives me the feeling I am not taken seriously.

Whereas in the introduction conversation, Carol indicated she felt she would have to get used to the pedagogies, now she expresses the explicit desire *not* to change as she thinks that is not the way “it works” for her. The friction Carol experiences results in feelings of “not being taken seriously”. She feels that what she is being asked to do in this program, which she refers to as “stupid assignments”, is in sharp contrast with her previous master’s degree and is apparently not a good match.

Her own preferences for learning and being taught, coupled with the amount of time she now “endures” different pedagogies only add to her feelings of friction and her intention of actively resisting:

C      You have the feeling that it’s not your thing, but you have to do it constantly. So, at a certain moment I get the feeling like: “Well guys, I won’t participate in this any longer!”

Carol also states that she’d prefer the “more accepted” way of teaching and learning at university. She confirms the educator’s probe that she experiences the program’s structured work formats as too directive, which has the connotation of “childish” in Dutch as well.

The supervisor invites the explication of the resistance, but also takes time to explicate some of the reasoning behind the pedagogy. She searches for possible solutions, within the program’s affordances. She suggests thinking of ways of making the program manageable or even educative. Carol acknowledges this suggestion, but does not explore it further.

Halfway through the program, Carol starts off by writing about her adjustment to the program, or lack thereof, in her portfolio:

“From how I am working on the portfolio currently, I deduce that I am getting used to the portfolio somewhat. It will not become one of my hobbies, but I have become accustomed to it sufficiently to draft my development here. I might try a different design in the future, inspired by multiple intelligences.”

Although still using a joke like “hobbies”, Carol describes having become adjusted to parts of the program’s pedagogies and ways of working. She herself now contemplates using a different design of her portfolio, as was suggested by her supervisor the previous conversation.

In general, the content and tone of this portfolio text differ from the start portfolio. The text hardly contains any jokes or metaphorical language Carol used to express friction in that text besides the one in the excerpt. Carol mainly describes adjustment or concrete plans of dealing with the program requirements while holding on to her own style.

Likewise, in the conversation with supervisor Mandy halfway through the program, Carol does not express much friction. It does not appear that Carol has changed her way of learning or preferences for instruction: when asked she still characterizes the short and structured assignments the program uses as “terrible” and still contends that she learns in a different way. She elaborates on her way of learning at the supervisor’s invitation:

- C The contemplation does not take place when I write in my log book.  
 M No?  
 C No, then I am more recapitulating: “What was it again, that I did? O, right, that was it.” And sometimes also what I thought about it, as in: “Well, these students are nice or not nice or are eating candy the whole time.” I regularly add what I thought about it, also concerning the [university] classes and such. But the bigger thinking process is triggered at other moments.  
 M Like you said before: when you’re...  
 C Yes, right, when I am just, like cooking or when I am talking to my roommate. Or when I’m swimming or ride my bike somewhere. That happens at different moments.

Carol still describes how she feels the “bigger thinking” does not occur when she writes in her logbook or any other program instrument for stimulating professional development. Nonetheless, she does appear to have changed the way she feels about the programs’ pedagogies. She now explains how she feels the liberty to take advantage of her own way of learning and reflecting and how she is looking for ways to combine her preferences with the program demands. Neither Carol nor Mandy refer to the friction of the past or present as resistance, but as “emotions about being in this program”.

Carol’s final portfolio is even more different from her start portfolio than the halfway portfolio text. Carol now provides a detailed description of how she has worked on her learning goals and combines this with a critical analysis of the instruments the program offers for this role. She explicitly and rather elaborately describes her participation in a professional development initiative “which I would not have been able to plan”. Except for this and another reference to unplanned learning, the content and tone of the text show no signs of the contrasts or jokes she used previously. She mentions in passing that she selected a different design of her portfolio, using images. She concludes with an image of herself as a teacher, who has outgrown herself.

Similarly, in the final portfolio conversation, the topic of friction only receives limited attention. The supervisor once more invites Carol to elaborate on it:

- M I have the impression that you might have found your own way more, and that you partly accepted: “Well, there are some things I find more difficult.” Is that correct? Or?  
 C Yes, well, it makes a difference that we had fewer classes in the second semester. Part of it is adjustment and I think: “Okay”. On the other hand I have continuously tried to make the best out of it in my own way. [...]  
 M Can you, once more say what it was that caused you to explore...to be uncomfortable at times?  
 C At first, I think it was the complete breach with real scientific education. Where you efficiently, in seminars, process the material. That was a real breach from the teaching here. It still really bothers me [...] This is still the case. I continue to be an academic, who just likes getting a few articles to read and then delve into them. [...] Just these endless little assignments: you have to consider this first and then that....That’s just not for me.

Carol confirms the supervisor’s conclusion that she has dealt with the friction she experienced partly by “adjustment”, and partly by “making the best out of it in my own way”. Looking back on the program and what caused the friction, she now mainly attributes it to the breach she experienced in the teacher education program after completing her previous master’s degree, which she labels as “real scientific”. Others have conceptualized such a breach as a “boundary” (Akkerman & Bakker, 2011). Carol still

experiences this boundary, as she states that she continues to be an “academic”, who does not appreciate the “endless little assignments”. These are just “not for her” and as such continue to be a source of friction, even though this was not as explicit in her text.

The supervisor also takes time to inquire into the different design of the portfolio, using images. She asks Carol how this worked out for her:

- C That worked out really well. It represents the feelings that come along with it a lot better. Because even though you can describe what you have done, then you lack the core of how it felt. Because a lesson could have gone well, if you just look at what happened, but it still feels bad for different reasons. So it is a better representation for me.
- M It is more complete.
- C Yes
- M Yes, even though you still wrote a description for all images.
- C Yeah, I kept track in my logbook how everything played out. Also for me, as in: “I would like to do this differently next time.” But, this was always accompanied by an image for myself, to make it more complete. So the combination is the best, but the image is what captures it best for me.

Carol seems pleased with having captured both her intuition and having met the program requirements in this alternative design of her portfolio. She feels images “better represent” both the actual events in her practice, as well as her emotions and other aspects she feels are important. The supervisor, however, seems to be of the opinion that Carol has done more than writing “a more complete” portfolio:

“Well, I can imagine this is almost a paradox. Your portfolio is actually one that I would like to show everyone as an example of how we hope a portfolio will look. As you show how you can reflect from different perspectives and how you perceive theory and critically reflect on yourself. But the funny thing is that this portfolio is written by someone who is very skeptical about it. And that is the beauty of it, for me. That both of us managed, from both perspectives, to make something out of it.”

### *Sabrina*

Mandy starts the first conversation with Sabrina with asking about her experiences in the program so far:

- S Well, nice! Exhaustive...very exhaustive. But I think the class is really positive. The group.
- M Yes. And, what makes it exhaustive?
- S Well, I think the new impressions. Those always tire me a little. But also the self-reflection and such. Those...that I can't stand very well.
- M No? You can't stand that very well?
- S No
- M What do you mean by that?
- S I just don't really like dissecting yourself in that way. I notice it just physically tires me, so to say. That I really think: “Ooh, I'd like to sleep now.”
- M And is it, is that because you do things that you do not find comfortable?
- S No, I don't know where it originates. But, we completely never did this at History. We never collaborated. Just: “This is your schedule and this is what we will do”. Start doing it. So, this is just different.
- M Yes, you say it is exhaustive. You are a little reluctant about if you think it is comfortable or not. Does that mean that you do or do not feel comfortable with it?

- S Well, it would not be my favorite way at first. [...]
- M Is it too personal?
- S Well, I think it is more something psychological. It used to happen to me a lot, that I was really tired. And most of the time, this is when something is bothering me or when I am dreading something. So, that I know about myself. I notice now that I am tired in the same way.
- M Right, okay.
- S So I will, so I know that's the reason I am tired. So I think I will have to learn....I will learn how to deal with that at a certain moment.

Sabrina characterizes her experiences ambiguously, using both the qualifications “nice”, as “exhaustive”. She attributes this exhaustion to the new impressions, which always tire her a little, and the “self-reflection”, which she can’t stand very well. Next to the fact that she is not used to these ways of teaching, as they differ from her previous History master’s program, she does not really know the origin of this feeling. She does recognize it from previous experiences when something was bothering her or when she dreaded an upcoming event. Despite the fact that she now has similar feelings of exhaustion as in these unfortunate circumstances, she does not necessarily evaluate her experiences in the program as negative and can also see how reflection can be beneficial for learning to teach. She concludes that she feels she must learn to deal with these feelings “at a certain moment”.

Supervisor Mandy tries to explore this friction more, but Sabrina’s answers become very short. Mandy stresses that Sabrina should keep track of feelings of friction and approach her, if these feelings become urgent. The remainder of the conversation is about practicalities, which Sabrina is eager to learn about.

Six weeks later Sabrina’s portfolio text consists of these two sentences:

“The completion of this role partly concerns this portfolio. Here, I can write everything I want to achieve and what I have achieved thus far and form an image of what I must improve and how I will do this.”

This appears to be a short description of what Sabrina could write down in this part of her portfolio, reformulating the program’s expectations in her own words.

In the conversation with supervisor Mandy about this text, Sabrina does express the fact that she experiences friction:

- S Things like activating pedagogies, we really try to endorse those. And I do find them somewhat important. But with it, it seems as though the whole basis is gone. I would actually also really like to learn: “How do you give a good verbal lesson”. So to say. That, for me, is the point of departure. And then I would consider that additionally, I would like to introduce some variation. [...] I do find that a pity, because we have no...well, we do have some basis. But, I would like to just be able to teach well and then take the extra step of: what kind of variations could I introduce?
- M I want to avoid becoming defensive, [because] I do not feel attacked. [...] And I want us to seriously consider if there are ways in which we can do something, or ways in which you can do something, to make it more bearable. I don’t think there is necessarily one definition here at the program, which states that activating pedagogies are better. Or that one [kind of pedagogy] is good and others are not. We do have beliefs about good

- teaching. Namely that what good teaching is, is that the student learns eventually. And there are learning theories about that. We work in a socio-constructivist way [...].
- S No, I do understand. It's not that. I do understand. And things do connect. It does work in a certain way. But right now, it's just a little too much, so to say. For me.
- M Too much...too distant from what you can really apply? Is that what you mean?
- S No, because I am able to apply it to some extent, but... For instance, we are constantly being taught here that you should address different students in different ways. But we are constantly being addressed in the wrong way.[...] We are just constantly being presented with those activating [work formats], whereas we are not built for that.

Like Carol, Sabrina refers to her feelings of friction as resistance in this conversation. She is not as explicit as to what brings this friction and her portfolio text does not provide starting points for the supervisor. What Sabrina does mention, is that by being taught in this way, she feels she is not adequately prepared to teach well. For her, the starting point of teaching is lectures, which she refers to as verbal lessons.

In response, the supervisor stresses that it's not the program's intention to promote "activating pedagogies" as the only way of teaching, but that the program works from a socio-constructivist philosophy. Sabrina responds that she understands the philosophy and that "it does work in a certain way", even that she herself also knows how to apply it, but that it is too much of the same at the moment. The underlying goal of these work formats, differentiation and addressing different learners in their own way, is not being met at the moment, as she feels she is "constantly being addressed in the wrong way" or is not "built" for the program's pedagogies.

Mandy invites Sabrina to think of possible solutions, which meets little response. As both Sabrina and Carol did indicate they would like to know the theory that underscores the pedagogies used, Mandy suggests to dedicate a class meeting to this, which takes place a few weeks later.

Sabrina's halfway portfolio text is rather different from her start portfolio text. It still does not contain any reference to friction, but does illustrate her current struggle in learning to teach in this particular teacher education program:

"For me the main point of attention is reflecting on my own behavior. I have difficulties with forming an objective image of my behavior in front of the class. I also noticed that my own image does not always correspond with the image others have of me. [...]  
For my next internship, my resolution is to reflect on myself even better."

Sabrina now describes reflecting on her own behavior as a learning goal, which sharply contrasts her introduction portfolio conversation comment that she does not like to dissect herself. Moreover, she mentions how she now strives to identify and label her own behavior in the classroom better. Although Sabrina is not very explicit about what "reflecting better" means for her, all in all this description and goal seems very much in line with those of the program: being able to independently form a good picture of yourself as a teacher, by reflecting on your own behavior.

Next to the fact that her text is much shorter than Carol's (520 words compared to 974 words), Sabrina also uses the program's instruments for this role in a very different way. In this text, Sabrina

merely refers to these instruments, whereas Carol included a critical analysis of their use and outcomes and related them to her own experiences or understanding.

In the halfway portfolio conversation, Mandy asks Sabrina about “functioning in a program that doesn’t work how you yourself had conceived”:

- S Well, it’s all right. Yes, at any rate, I don’t go to class meetings against my will. So, I kind of like it.
- M Yes, well...I appreciated what you said about the meeting on multiple intelligences. About the logical mathematical intelligence and how that is really concrete. And explicit. In those cases you really know: I understood it correctly or I did not understand it, so to say. So, on the one hand I recognize this [in Sabrina]. And it is quite informative about how you identify knowledge. Or how you try to get these things clear for yourself. [...]
- S But I also notice, which I hate about myself: in my portfolio I can exactly pin point what I already can and cannot do [as a teacher]. But I am less able to identify what gives me this indefinite feeling. That I am rather anxious, so to say. Or something. Because well: I just can’t deal with that. I don’t know what causes it and I don’t know how I can improve it. But I think that, through experience and adjustment, it will resolve itself on its own.

Based on Sabrina’s elaboration of Gardner’s multiple intelligences, Mandy infers that Sabrina might appreciate more strict guidelines and more certain knowledge than generally provided in the program. Sabrina agrees with this inference. She describes an internal struggle: on the one hand she is perfectly capable of identifying what she is and is not capable of (as a teacher), which is part of the program’s goal with reflective and constructivist pedagogies. On the other hand, she is unable to isolate what gives her this “indefinite” feeling, which she described as “exhaustive” in the introduction conversation, as “unsatisfying” in the start portfolio conversation, and which continues to cause apprehension. She seems to think she “just can’t deal with it” nor does she know how she can improve it. She herself thinks that experience and adjustment will make it better.

Subsequently, Mandy appears to locate the origin of this feeling in Sabrina’s insecurity about meeting ambiguous external expectations and tries to explore this issue more. Sabrina agrees, yet subsequently refines to giving short and general answers. They conclude the conversation without drawing conclusions on this issue.

At the completion of the program, Sabrina’s portfolio text is rather different from that what she had written halfway through. It is rather short (261 words). The following excerpt is illustrative of the text:

“I have succeeded well in reflecting on my own lessons in the past year. When I was not satisfied about certain lessons or situations, I could determine well, by myself, what I wanted to do differently next time.”

Sabrina now feels she was able to reflect well, in contrast to her previous text. Yet, she now understands this reflection to be confined to determining for herself what she would do differently when she was “not satisfied about certain lessons or situations”. She does not mention identifying the cause of the indefinite feeling, which she had discussed with her supervisor as her main concern in this respect previously.

Her supervisor addresses this issue by inquiring about Sabrina’s second cooperating teacher’s evaluation of her reflective abilities, which was very positive:

- S Well yes, I am just rather good at identifying why things go well or not so well. So I think that is indeed one of my stronger points. But, the more personal [questions].... Burt [cooperating teacher] used to do that a lot in my first internship. As in: “Why? What causes that? How does that feel?”
- M Yes
- S And that, I just can’t stand that very well. But apparently I am able to avoid that easily, because I can assess what went well and what didn’t go well.
- M So, do I understand you correctly to say: “I prefer when I can discuss these things in a more business-like way.” More about execution, than about what it says about who I am and what I want?
- S Yes, yes. That is just where I think the difference lies.

Sabrina locates her difficulties in the type of reflection she was being asked to engage in. She struggles with questions about her feelings and how her behavior reflects who she is or wants to be as a teacher and prefers a less “personal” and more “business-like” way of reflecting. This type of personal reflection has been referred to as “core reflection” in the literature (Korthagen & Vasalos, 2005). As the question Mandy asks Sabrina about her feelings of friction in the portfolio conversations are of a more personal nature, Sabrina’s short answers could be understood in light of this preference.

Mandy asks Sabrina to recapitulate what had caused the friction in the program:

- S The way in which some assignments...That is not a good fit with me.
- M No, well, we have talked about this, of course. [...] Eventually, adding things up you think: “Well, I am satisfied with where I am now?”
- S Yes
- M Only you think, as I understand: it did take a lot of getting used to the way of working.
- S Yes and I myself would not have...I still do not appreciate it, so to say. [...] So it did not result in problems, but it is just not my preference.

Sabrina identifies friction with the program’s pedagogies and contends that she “still does not like it”. Yet, she also mentions several times that she is satisfied with the program and that it was educative and very meaningful for her. She summarizes these seeming contradictions nicely in saying: “It did not result in problems, but it is just not my preference”.

## Discussion

Both Carol and Sabrina experience friction throughout the teacher education program. The expression of that friction was most prominent after six weeks in the one-year program, which is the only time they refer to it as resistance. Carol attributes this friction to a *discontinuity* (Akkerman & Bakker, 2011) between her understanding of learning as unplanned, unconscious and especially unwritten and how she perceived the teacher education program to understand and promote learning. This gradually changes and after successfully having used images, next to words in her final portfolio, she no longer mentions this as a cause of friction. The other source of friction for Carol, how she experiences the program’s pedagogies, is present throughout the year. She continues to express a preference for a different way of being taught: mainly less collaborative and less pre-structured.

In contrast, Sabrina identified the personal nature of reflection as the origin of her friction at the beginning and end of the program, but singled out other, sometimes contradicting, aspects of the pedagogies halfway through, among which the program's ambiguous guidelines. Although Sabrina is able to explicate exhaustion, dissatisfaction and indefinite feelings of apprehension which the friction she experiences triggers, she is unable to really pin down what causes these feelings or how she can deal with them – which in turn only increases her friction.

The friction both students experience thus appears to be the result of a complex interaction of the program's way of teaching and promoting learning; Carol and Sabrina's previous teaching and learning experiences in their previous master's degree; their conceptions of learning and of teaching; and their understanding of what university education should entail.

Carol has different ways of expressing her friction: first, she uses provocative language and jokes to express her strong emotions. Later on, she mainly just explains how certain elements in the program are not a match for her. In the literature, such behavior is often conceptualized as *active resistance* or the explicit “negative stance towards the dominant discourse” (Middleton et al., 2011, p. 69). Interpreting the program's discourse through her own socio-cultural and historical lens, Carol explicitly rejects the expectations and practices corresponding to the teacher education program, as is common with such resistance.

Quite the opposite, Sabrina does not express friction on her own initiative at any moment in the program. For her the friction manifests itself not by what she says or writes, but more by what she does *not* say or write. Her portfolio texts about her own learning and development as a teacher are relatively short. She struggles to answer the more detailed or concrete questions her supervisor asks her about her learning. In her final portfolio text and conversation, she seems to adhere to a different understanding of what kind of reflection is necessary for a teacher. These expressions of friction are not easily identified as resistance, yet they can be seen as indicative of a lack of engagement in the program's philosophy. This has been described as a specific type of resistance, namely *disidentification*, or “the abandonment of goals corresponding with one or both communities” (Middleton et al., 2011, p. 69).

Over time, Carol and Sabrina have different ways of dealing with their resistance. Next to adjustment on their part, the traditional solution in the literature (e.g., Gunn, 2010; Korthagen et al., 2001), this also results from their efforts and supervisor Mandy's attempts to have the students explicate the friction in their own way. This resembles creating “metadissonance” (McFalls & Cobb-Roberts, 2001) or fostering awareness of the experienced friction. Additionally, Mandy was open to seek ways in which Carol and Sabrina could meet the program's requirement in a way that was also educative for them. This resembles dealing with the friction by supporting “boundary crossing” (Akkerman & Bakker, 2011): managing the experiences of discontinuity, which can emerge by simultaneously or successively participating in communities with different cultures, for instance different learning environments.

The learning potential of resistance is visible in Carol's case. She first contrasts the differences between her own and the program's understandings of learning and teaching in her start portfolio, which

has been conceptualized as “identification” or explicating fundamental differences by juxtaposing (Akkerman & Bakker, 2011) in boundary crossing literature. Gradually, she searches for ways in which she can relate to the program’s expectations and goal. In the end, Carol creates a new design for her portfolio that meets both the program’s and her own expectations, which has been conceptualized as “transformation” or the creation of a new, in-between or boundary practice (Akkerman & Bakker, 2011). In doing so, Carol assumes agency and actually appears empowered as a result of her resistance. She and her supervisor really appear to be able to take up her resistance as an entry into a dialogue or an explorative process (cf. Kindred, 1999). Carol’s case also supports findings reported by Sannino (2010) that engagement in resistance is necessary for this to take place.

Sabrina’s way of dealing with the friction is different. Her engagement in and identification with the program, or lack thereof, follows a similar trajectory as that described by Hodges (1998), who coined the term disidentification. Both Hodges’ and Sabrina’s trajectories show initial attempts by the student teacher to become (more) engaged in the teacher education program. Sabrina’s halfway portfolio is exemplary of such an attempt engage in the program’s goals. However, in both cases in the end the students must conclude that they are unable to identify with the program’s philosophy, although they do participate in it in order to complete their program. As such, Sabrina’s strategy to manage the discontinuities she experiences differs from Carol’s. Sabrina relies more on what Akkerman and Bakker (2011) refer to as “coordination” or searching for means of communication across different cultures, even in the absence of consensus. Sabrina does this by using the discourse and the instruments of the teacher education program in her own way. Although this makes it possible for her to meet the program’s demands and eventually graduate, it also entails that for Sabrina this friction has not developed into something as constructive or educative as for Carol.

### ***Limitations***

A primary limitation of this study is the nature of our data sources. The texts in the portfolio as well as the conversations are intended to explicate and also trigger some degree of reflection. As this is also partly what causes friction, this might have influenced our findings. Moreover, both instruments were embedded in the teacher education program. This could give rise to high ecological validity, but also means that they serve a specific purpose in teacher education, namely assessment. Although there appears to be a high degree of trust and safety in both the text and the conversation, it could be that the students decided not to share some things because of this. Lastly, our longitudinal analysis rests on two purposefully selected cases. As such, more research is required to explore if and how these results are applicable in other contexts.

## Conclusion

In this chapter we set out to *explore the implications of an alternative understanding of resistance* for (research on) teacher education. In the literature, resistance is often conceptualized as an oppositional act, and as something that should be overcome as it impedes learning. In contrast, we conceptualized student teachers' resistance as explicated friction, interactive in nature, which can be exploited to foster learning. We analyzed our case studies of Carol and Sabrina with this alternative conceptualization.

Our findings indicate that neither resistance itself, nor its causes, can be understood as relatively stable. Carol and Sabrina identified different causes for the friction they experienced at different moments in time. Moreover, almost each time they identified a certain cause, they added that it might work differently for other students or that they could also see how it would work, but just not under the given circumstances. As such, understanding resistance as the result of the interaction between the student teacher and his environment, based on notions of friction (Vermunt & Verloop, 1999), implies that student teachers cannot be held solely accountable for their resistance.

The manifestation of resistance changes over time. Carol first uses rather provocative and oppositional language to express resistance at her own initiative, which we conceptualized as active resistance (based on Diamondstone, 2002; Middleton et al., 2011). Gradually, her friction becomes less apparent as she finds a way to transform it into something productive. Sabrina mostly expressed her resistance by not engaging, or disidentifying (based on Hodges, 1998; Middleton et al., 2011). This is apparent from her short texts and short answers to her supervisor's questions and her superficial use of the program's instruments. As such, the supervisor herself had to encourage the explication of friction, in spite of the fact that it was always present. This implies that educators would be wise to encourage the explication of friction, as disidentification is not easily recognized as resistance, as it is not overtly oppositional, whereas its consequences can be just as real.

The differences between Carol and Sabrina imply that the outcomes of resistance should be seen as tentative. Carol's case showed that resisting is not necessarily destructive. For her, resisting actually appeared to support her in explicating her own way of learning and thereby think of ways in which she could negotiate the program's demands and her own preferences. Her way of managing the friction she experienced thus appeared to be very successful not only in terms of learning to teach, but also in terms of feeling capable of doing so on her own terms, now and in the future. In contrast, Sabrina's case shows that resistance is not necessarily constructive either. Although Sabrina was successful in dealing with the friction, as she was able to complete the program, she incurred the drawbacks of participating, without really identifying.

Interestingly, the educator's strategy in dealing with both students' resistance was highly similar. It mainly consisted of inviting the students to explicate the friction in their own way, including legitimizing their concerns, but also encouraging the students to think of possible solutions within the boundaries of the program. As the outcomes of the two cases are so different, this invites further exploration in future

research. A possible explanation could be that for Sabrina the supervisor's questions to engage in the resistance were in fact part of what caused the friction, as they were the kind of personal questions she struggled with.

In conclusion, past research in has shown that both traditional as well as innovative pedagogies can give rise to friction (Vermunt & Verloop, 1999) depending on, among others, the context, the student teacher and the interaction between them. Therefore, some degree of resistance to teacher education pedagogies seems to be unavoidable no matter what pedagogies are employed. Hence, we do not propose to criticize either traditional or innovative pedagogies or suggest that they should be altered, based on our results. Instead, our results draw attention to the potential of exploring and thereby exploiting resistance in the process of learning to teach. For educators, engaging in resistance can be informative to understand the complexity of their students' learning processes better, whereas for students engaging in resistance can entail assuming or extending agency of their own learning. Therefore, for both educators as well as students the potential implications of resistance, destructive or constructive, seem too significant to forsake.



## Chapter 7 Continuity and discontinuity between research and teaching<sup>8</sup>

### Abstract

University teachers in teacher education programs are increasingly expected to combine teaching and research, in spite of widespread recognition of the differences between these epistemic practices. This study questions how the (dis)continuities university teachers encounter when engaging in a collateral transition between research and teaching, are experienced. To answer that question, this study engages in an in-depth longitudinal analysis of 84 weekly journals reported during such a transition. In contrast to widely held assumptions, we find that continuity can also be experienced negatively, whereas discontinuity is sometimes experienced quite positively. Based on our results, we offer suggestions for how transition processes can be supported.

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<sup>8</sup> This chapter is based on Bronkhorst, L. H., van Rijswijk, M. M. Meijer, P. C., Koster, B., & Vermunt, J. D. (2013). University teachers' collateral transitions between research and teaching. *Infancia y Aprendizaje*, 36(3),

## Introduction

In the last decades, most teacher education programs in Dutch universities were institutionalized separate from disciplinary faculties. Usually, staff members either taught or conducted research in the teacher education program. Similarly, professional backgrounds differed of those responsible for these two tasks. University teachers primarily responsible for teaching in the teacher education program, referred to as *educators*, were often accomplished teachers in a particular subject matter area, for which they possess a master's degree. They are not required or expected to have completed formal education in learning and curriculum studies beyond their own post-graduate teacher education degree, as is common for educators in the Netherlands and, for instance, Australia (Hamilton & Clandinin, 2011). On the other hand, university teachers primarily responsible for research in the teacher education program, referred to as *researchers*, were often PhD students with a background in educational sciences, without teaching experience in secondary education nor a teaching degree.

Recently, in line with ideas on research-based teacher education (Kansanen, 2005; Kansanen, 2006), both educators and researchers in these teacher education programs have been encouraged to become active in the other profession as well, as that is expected to benefit student learning (cf. Lucas, 2007). Accordingly, over the past years, a number of educators has taken up opportunities to take on research and a number of researchers has begun to teach in the teacher education program, in addition to their traditional task or profession.

Previous research illustrated how combining teaching and research in teacher education can benefit university teachers' learning and development, for instance by self-study research (Loughran, 2007). Yet, there is also evidence that finding a new position within ones working environment often summons feelings of uncertainty and vulnerability (Meijers, 2003). More specifically, in taking up a new task, boundaries are often encountered (e.g., Lindgren & Wählin, 2001), which are said to be rather challenging to manage (Ibarra & Barbulescu, 2010).

### *Consequential transitions*

Throughout the literature, research and teaching are described as fundamentally different (Bartels, 2003; Broekkamp & Hout-Wolters, 2007; Tyler, 2009). As such, university teachers engaged in teaching or research rely on different norms to ascertain what counts as knowledge and what are accepted ways of knowledge development (Akkerman et al., 2013). As such, teaching and research can be seen as different epistemic cultures (Knorr-Cetina, 1999), with their own history and practices. Tensaki and Hay (2004) aptly characterize these epistemic cultures, describing teaching as concrete, local and related doing and action, contrasting it with research, which they characterize as abstract, general, and related to thinking and reflecting.

These differences are sometimes said to be incommensurable and as a result a "gap" is said to exist between research and teaching (Korthagen & Kessels, 1999). Increasingly, various initiatives are

being developed to overcome this gap in educational research in general (Rickinson et al., 2011) and in research on teacher education in particular (Hagger & McIntyre, 2000; Kansanen, 2006). These initiatives exist at different levels of teacher education: there are initiatives for the university teachers (e.g., Krokfors et al., 2011; Lucas, 2007), for the student teachers they are teaching (e.g., Jyrhämä et al., 2008; Korthagen & Kessels, 1999) and for the mentor teachers that supervise student teachers during their internships at secondary schools (e.g., Bullough, Draper, Erickson, Smith, & Young, 2004).

Previously, how teachers across the different levels of teacher education bridged this gap was examined using a transfer metaphor, mostly focusing on if and how teachers applied theoretical knowledge to teaching (Randi & Corno, 2007). Increasingly it is being recognized that this metaphor does not do justice to the complexity of the issue (Tuomi-Gröhn & Engeström, 2003). For one, this metaphor reduces the richness and the complexity of the experience of taking on a new role to the transfer of knowledge, or lack thereof. Transfer is sometimes considered unsuccessful when adaptations to the theoretical knowledge are made, even though these adaptations might afford a better application of the theory to the educational context at hand (Billett, 2001a). Moreover, transfer research takes a unidirectional perspective and fails to examine how taking on a new role can also trigger a renewed understanding of the other epistemic practice in which one was already used to participate (Akkerman & Van Eijck, 2011; Beach, 1999).

As a result, this “bridging the gap” has recently been conceptualized differently (e.g., Konkola et al., 2007; Randi & Corno, 2007; Tuomi-Gröhn & Engeström, 2003). Correspondingly, Beach (1999) has introduced the concept of *consequential transition* to describe “a developmental change in the relation between an individual and one or more social activities” (p. 114). Beach argued that this developmental change should be considered as consequential as it “potentially involves the construction of knowledge, identities, and skills, or transformation, rather than the application of something that has been acquired elsewhere” (p. 119).

As this change in the relation can be the result of a change in the individual, the activity, or both, Beach distinguished different kinds of transitions. The situation described in this study, university teachers becoming active in both research and teaching, is aptly described as a *collateral transition*: “individuals’ relatively simultaneous participation in two or more historically related activities” (p. 115).

### ***Boundaries***

Past research has indicated that transitions are often experienced as challenging by the individuals engaged in the transition, because differences between practices are encountered (Beach, 2003). These socio-cultural differences have been conceptualized as *boundaries*<sup>9</sup> (Carlile, 2004; Tuomi-Gröhn & Engeström, 2003). We define boundaries in line with Akkerman and Bakker (2011) as “sociocultural differences leading to *discontinuity* in action or interaction” (p. 133). Discontinuity entails that ongoing learning and

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<sup>9</sup> This being the case, in the literature the term *boundary crossing* is also used to refer to concurrent participation in multiple practices (Engeström, Engeström, & Kärkkäinen, 1995).

working processes are stopped or hampered over time and space. Seeing as teaching and research are generally understood to be different epistemic cultures (Tyler, 2009), a collateral transition between them is expected to give rise to such discontinuities and hamper ongoing processes.

On the other hand, in the literature there are also reports of transitions between practices, in which *continuity* or the extension of learning and working processes over time and space is encountered (Akkerman & Bakker, 2011). The fact that it is common practice for university teachers of teacher education programs in other countries to combine research and teaching tasks (Hamilton & Clandinin, 2011), indicates that continuity may also be present. In general, continuity or coherence between different epistemic practices appears to be favored in research on transitions in general (Ibarra & Barbulescu, 2010), and also for university teachers specifically (Tyler, 2009).

However, recent studies show that even though discontinuity can be challenging, it can also have the potential to create new understandings and/or trigger a change of practices (Engeström & Sannino, 2010; Finlay, 2008; Guile & Young, 2003; Tsui & Law, 2007). Based on their extensive review of boundary crossing, Akkerman and Bakker (2011) distinguished different ways in which discontinuity can hold learning potential, either by (re)construing the differences between practice to make profound sense of them or reestablishing continuity across practices. This potential of discontinuities is horizontal or across different sites. This contrasts the more familiar understanding of potential in learning or development, which is vertical or within one site, from novice to expert (Akkerman & Van Eijck, 2011; Engeström et al., 1995).

### ***Experiencing (dis)continuities***

Beach (1999) argues that the outcomes of transitions “involve a notion of progress for the learner and are best understood as a developmental process. Each is consequential and often involves changes in identity” (p. 119). Emotions have been found to play an important role in transition processes with implications for identity (Meijers, 2003). Correspondingly, Zembylas (2003) states that: “[teachers] need to construct defense and support mechanisms to continuously re-construct and re-affirm their identities. Feeling inadequate may color a teacher’s entire emotional life.” (p. 228). He further claims that transformation within and transitioning across ones practice involves taking risks. When engaging in new tasks one encounters normative expectations, from others and from oneself, about assimilation into pre-determined roles and expectations.

Interestingly, although discontinuities encountered in a transition are seen to hold learning potential, research on identity development expresses a preference, implicitly or explicitly, for continuity, as discontinuity or incoherence can give rise to uncertainty and is expected to lead to negative experiences. For instance, Ibarra and Barbulescu (2010) studied how the continuities and discontinuities encountered in transitions are experienced. They not only argue that discontinuities impede or prolong the transition, and that “rupture” is experienced, but also that emotional discomfort arises “when people are unable to draw a continuous link between old and new selves” (p. 140). Similarly, Alsup (2006) emphasizes that being in an “in-between” role during a transition can give rise to uncertainty and low feelings of self-efficacy.

This preference for continuity for affective reasons can be questioned, as few studies have explored in-depth how continuity and discontinuity are experienced over the course of a collateral transition, despite the fact that boundaryless careers are becoming increasingly common (Meijers, 2003). Existing research that explores this issue either focuses on boundaries on a system level, with little attention for the individual experiences (Akkerman & Van Eijck, 2011) or takes a static, retrospective perspective which fails to understand the process as it unfolds over time (Ibarra & Barbulescu, 2010). As a result, we are still far from understanding how the complex dynamics of collateral transitions are experienced by those involved in it.

Therefore, as university teachers' collateral transitions between research and teaching are expected to be consequential, we set out to explore how the continuities and discontinuities encountered during such a transition are experienced as the transition unfolds over time. To shed light on this issue, we documented the collateral transition of two university teachers, as they moved across the boundary of the domain that was familiar to them - in opposite directions. We aim to understand their experiences in this collateral transition in terms of the affective experiences of crossing the boundary between two epistemic cultures. By documenting the experiences in the new role on a weekly basis during one academic year, we were able to explore how actions and interactions encountered in the process of transitioning, are experienced. Our research questions are: 1) *What continuities are encountered in a year-long collateral transition between research and teaching and how are they experienced?* 2) *What discontinuities are encountered in a year-long collateral transition and how are they experienced?*

## Methods

### *Context and participants*

The study took place in a university-based teacher education institute in the heart of the Netherlands, offering a one-year, post-graduate, subject-matter specific teacher education program, leading to a subject-matter specific teaching license for all levels of secondary education. This teacher education institute can be characterized by its emphasis on reflection and self-regulation, with regard to student teacher learning and development (which has been described as "realistic" teacher education by Korthagen et al., 2001) and regarding the professional conduct of the university teachers (i.e. the educators *and* researchers) working there. For instance, educators working in the institute are stimulated to systematically work on their professional development and become as certified teacher educators by the Association of Dutch Teacher Educators, even though this certification is voluntary in the Netherlands (Koster, Dengerink, Korthagen, & Lunenberg, 2008).

As explained in the introduction, university teachers working in teacher education institutes were traditionally either involved in teaching or in research in the teacher education program. In light of the potential benefits of having university teachers participate simultaneously both practices (cf. Lukas, 2007), the management of the teacher education institute urged university teachers to start to participate in both

research and teaching. Several university teachers seized this opportunity. Cognizant of the reflective power of explicating experiences during a transition process (e.g., Beach, 2003), two of these university teachers voluntarily set out to document their experiences in their collateral transition by means of an *autobiography* (Ellis & Bochner, 2000), better known in research on teacher education as a *self-study* (Loughran, 2007). As such, the current study started out as a personal initiative of these two university teachers with contrasting professional backgrounds.

Christine (pseudonym) was a 39 year old educator, who had worked at the teacher education program for 12 years when this study started. Prior to that, she completed her teaching degree for art history. Christine engaged in the transition towards research as she was assigned formal time to work on a paper for an international conference, supervised by two experienced researchers. Halfway through the year, she also applied for a full PhD trajectory, which she was awarded in the end. Erica (pseudonym) was a 28 year old researcher working on her PhD thesis, who had worked at the program for 2 years prior to this study. She had completed an Educational Sciences research master's degree prior. Erica started team-teaching general pedagogy classes in the teacher education program. She also became involved in the supervision of student teachers' and experienced teachers' practice-based research.

### *Instrument*

An open-ended instrument that captured the university teachers' encounters and experiences in the new role on a weekly basis was created with the following considerations in mind. First, the instrument did not contain a-priori restrictions concerning content, in order to capture the transition process as it would unfold naturally. Moreover, as we sought to minimize the effect of the measurement on the process itself, we decided against directly inferring into (dis)continuities encountered and experienced. Lastly, seeing as previous studies have been criticized for using a retrospective design, which offers a static picture colored with hindsight (Ibarra & Barbulescu, 2010), we opted for a longitudinal design with weekly measurements.

Consequently, seeing as previous research had indicated that experiences *of* and *in* transitions are documented well through self-narration (Hermans & Hermans-Jansen, 1995), the university teachers arranged to self-narrate a self-chosen encounter in their new practice and which they found meaningful on a weekly basis during an academic year. To stimulate reflection on how these encounters in the new role were experienced, an image that captured the essence of the experience was also included (cf. Zaltman & Coulter, 1995).

The two university teachers individually reported these self-narrations and images, from now on referred to as *weekly journals*, electronically on a weekly basis (i.e. each Sunday evening) over the course of an academic year. All weekly journal contained a caption which details the main event or topic (i.e. the encounter) of the self-narration. The date of writing and the keywords used to search for the digital image online were also included. The main part of the weekly journal was the description of the encounter and how it had been experienced. These descriptions generally contained about 300 words each; the shortest being 116 words and the longest 987. We collected 42 weekly journals concerning a situation encountered in the new practice during the course of one academic year for each university teacher; hence a total of 84

weekly journals were used in the analysis.

### *Analysis*

We analyzed the journals in several rounds using Atlas.ti 7. We started with segmentation, as we decided to only include the written self-narratives in the analysis, as the images were only included as a tool to stimulate written contemplation about how the encounters were experienced. We noted that there were several references in the weekly journals' text to creating them. This could refer to the way the journal was written; the effort, or lack thereof, it required; and if or how writing it helped seeing things in perspective. It also appeared that both Christine and Erica only included encounters if these had been, in some way, meaningful in their transition. As such, the weekly journals should be considered self-selective reports of the collateral transitions.

Table 7.1. *Code description and representative examples for encounters of continuity and discontinuity*

	<b>Code description and signal words</b>	<b>Examples from the data</b>
Continuity	(inter)actions are described as prolonged over time and space, signaled by the use of words as: as well (as), both, still, (well) known, normal(ly), regular(ly), usual(ly), the same, remain, in general, pattern	This week I noticed that with teaching I also have difficulties in stating what I want. And indicating why I would like to change certain things. That is actually the exact same thing I normally experience with research. (Erica, week 27)
Discontinuity	(inter)actions are described as hampered over time and space, signaled by the use of words as: different, even though, for the first time, to notice, more or less of something; or the use of contrasts including: as a researcher / educator, here / there, before / after	It is strange noticing that I am starting to get an idea about the data, but that a lot of work has to be done to be able to formulate a conclusion. That is really "slowing things down" compared to how I normally go about writing texts. (Christine, week 23)
Both	Prolonged and hampered (inter)actions are both described, signaled by the use of words as: but, as well, on the one hand, on the other hand, also	I notice I do not really find it strange or surprising, but it is somewhat remarkable. (Christine, week 26)

First, we analyzed each weekly journal and coded if the journal described one or more situations of continuity or discontinuity in action and interaction, or both. Subsequently, we coded each journal in terms of how these situations were experienced: positive, negative, mixed or neutral. This last category was also applied when no real emotions were described or when reactions to actions and interactions were described analytically, as was the case with, for instance, descriptions of surprise. Tables 7.1 and 7.2 detail our codes, inclusion rules and examples from the data for each code. The first two authors coded each

weekly journal independently and compared their results. There were small differences, for instance, when one of us coded positively experienced and the other coded mixed experience. The authors discussed these differences until they reached agreement on all the codes.

Table 7.2. *Code description and representative examples for positive, negative, mixed or neutral experiences*

	<b>Code description and signal words</b>	<b>Example</b>
Positive emotions	The encounters described are evaluated positively, signaled by the use of words as: good, happy, familiar, appreciation, pleasurable, attracting.	Hurray! Rereading the article it suddenly made sense. I now realized the added value of my research. (Christine week 16)
Negative emotions	The encounters described are evaluated negatively, signaled by the use of words as: pity, difficult, failing, disappointed, fed up, insecure, frustration, doubt	I felt bad about it the whole weekend, I was doubting the way I prepared the workshops, and I regretted putting so much energy into it. (Erica week 19)
Mixed emotions	The encounters described are evaluated both negatively and positively, signaled by the use of words as: well as, but, on the one hand, on the other hand, although	Happy feelings, because for the first time I really experienced what I'd always read about. But I was also fed up it didn't go as planned. (Erica, week 2)
Neutral	The encounters described are not evaluated affectively, signaled by the lack of other signal words or the use of words as: different, distinctive, curious, what stood out for me	All things considered I think my development is steady at the moment. Being a researcher or not is much less of an item, I just do the things that are necessary for my research project. (Christine, week 34)

Before interpreting the results, we analyzed the two transitions to assess comparability. We mainly found similarities in the number of encounters of continuity and discontinuity described, as well as how they were experienced, even though the content of the encounters and experiences differed.

## Results

In most of the weeks, both continuity and discontinuity was encountered (44%), followed by encounters which only describe continuity in action and interaction (33%). Few of these encounters were experienced negatively (14%) and most were experienced positively (35%). Table 7.3 contains the numbers and percentages of all categories of encounters and experiences.

Table 7.3. Number (#) and percentages (%) of weekly logs per category

Experiences		Encounters			Total	
		Continuity	Discontinuity	Both		
Positive	<b>Total</b>	#	18	3	8	29
		%	62.07	10.34	27.59	100.00
	<i>Christine</i>	#	9	1	5	15
		%	60.00	6.67	33.33	100.00
	<i>Erica</i>	#	9	2	3	14
		%	64.29	14.29	21.43	100.00
Negative	<b>Total</b>	#	2	3	7	12
		%	16.67	25.00	58.33	100.00
	<i>Christine</i>	#	0	2	5	7
		%	0.00	28.57	71.43	100.00
	<i>Erica</i>	#	2	1	2	5
		%	40.00	20.00	40.00	100.00
Mixed	<b>Total</b>	#	3	6	13	22
		%	13.64	27.27	59.09	100.00
	<i>Christine</i>	#	1	4	4	9
		%	11.11	44.44	44.44	100.00
	<i>Erica</i>	#	2	2	9	13
		%	15.38	15.38	69.23	100.00
Neutral	<b>Total</b>	#	5	7	9	21
		%	23.81	33.33	42.86	100.00
	<i>Christine</i>	#	3	4	4	11
		%	27.27	36.36	36.36	100.00
	<i>Erica</i>	#	2	3	5	10
		%	20.00	30.00	50.00	100.00
Total	<b>Total</b>	#	28	19	37	84
		%	33.33	22.62	44.05	100.00
	<i>Christine</i>	#	13	11	18	42
		%	30.95	26.19	42.86	100.00
	<i>Erica</i>	#	15	8	19	42
		%	35.71	19.05	45.24	100.00

Figures 7.1 and 7.2 show these encounters and experiences as they unfold over the course of the transition. In the following, we explore these findings in more detail.

### *Continuity encountered and experienced*

Right from the initial weeks of both transitions continuity between research and teaching was encountered. Many of these encounters simply occurred: continuity was met, without being effortful and

sometimes even without being reflected on. An exemplary encounter of effortless continuity is Erica's description of a discussion she had with student teachers' internship supervisors in week 5:

“The conversation was very pleasant. I really had the feeling we spoke the same language. I was surprised about it, but we were really complementary. We had also been worrying about the same student. When I told another educator, she laughed: ‘of course you speak the same language, you are also able to converse with me, right?’”

Although such effortless experiences of continuity were experienced positively, as the university teachers welcomed them, they were often also coupled with descriptions of surprise, or estrangement. These reactions appeared to result from the fact that continuity had not been anticipated.

Another kind of continuity both university teachers encountered was when a well-known and recurring pattern of behavior also emerged in the new practice. As the university teachers considered these behaviors to be unproductive, these encounters were experienced negatively. In week 27 Erica described how a challenge she knows from research, also emerged in teaching:

“This week I noticed that with teaching I also have difficulties in stating what I want. And in indicating why I would like to change certain things. That is actually the exact same thing I normally experience with research. Here, sometimes I am also disappointed in the guidance the environment offers.”

In describing continuity in action and interaction, both university teachers also referred to encounters that they related to an experienced fit in the new practice. Often, feedback from others, intended or unintended, gave rise to such deliberations. The following example (in week 26) describes how others treat Christine in a way that implies continuity or membership of the research community:

“Recently, I noticed that people keep taking me being active in PhD research for granted. [...] I myself tend to react somewhat cautious. As in: ‘Well well, it has not come to that yet...I am working on an article, but it remains to be seen if I will receive formal time for it.’ [...] For now, I mostly chuckle at the thought that people see me as a researcher.”

These encounters occurred more often in the later stages of the transition. They were experienced positively as they are understood to be reassuring. However, sometimes they were also secretly questioned as the university teachers are afraid of being overestimated in their new practice.

A last and special kind of continuity were those instances in which continuity was reestablished. Sometimes this was described as something that simply occurred as the result of unspecified changes that had taken place. For instance, in week 6 Erica described a renewed understanding of lesson preparation as a result of her participation in her new epistemic practice:

“So, actually a very pleasant experience that preparing well pays off in real in-action performance. I knew this from literature, of course, but now I really get the meaning of it.”

At other times, this reestablished continuity was the result of deliberate efforts. Christine's journal (week 29) described an example of a deliberate translation across practices. She narrated how she consciously used works of arts, belonging to her identity as an educator, to analyze her data:

“When I stranded in the analysis of the data, I still wanted to do something productive. I started to translate my thoughts into images while going through the data. Which works of art could I think of that matched well with what sprang to mind while reading the texts? [...] It gave me familiar language to talk about new things.”

Similarly, Erica described a permanent change or transformation in her research practice, as a result of her participation in teaching (week 31):

“What really made me think, is a change I have noticed in myself.[...] That I can no longer just pay attention to the content of presentations, but subconsciously also form an opinion and judgment the presentation style. [...] I approached my own presentations as an act of teaching (what I had not done as consciously before). [...] But in observing the presentations of others it appears as though the change in me is irreversible: I can't turn off the thoughts about the presentation style and structure anymore.”

### *Discontinuity encountered and experienced*

Discontinuity was also encountered right from the start of the transition and continued to be encountered in the last weeks. The encountered discontinuity could result from sociocultural differences between practices or from differences in the position the university teachers had within the practices.

The reported sociocultural differences between practices align with distinctions between research and teaching that are often made in the literature. For instance, Christine characterizes research as “laborious precision work”, “brain crunching”, and mentions at several occasions the importance of “finding a clear focus”. She often describes her “writing” process. Erica uses phrases as “in-action”, “enactment”, and “really connecting with students” to characterize teaching. She stresses the importance of “preparation”. Most of the time, these discontinuities were met with interest and curiosity, as they were experienced as being an important part of getting to know the new practice. In week 33 Christine described this as follows:

“I thought the search for an analysis strategy was interesting. ‘So this is how that goes’, I thought a few times.”

Similarly, Erica reported eagerly in week 2:

“For the first time, I experienced what I always read about! [...] That is really different from puzzling something out behind your computer, because you can't redo it.”

Sometimes, the university teachers explicitly identified differences between practices. For instance when Christine juxtaposed her research supervisor's feedback on her article with how she normally instructed her students in the teacher education program, (week 10):

“Nice and concrete: Work out this part to about 1 A4, this will then become 2 to 3 A4 of text. Compare that to the *open* assignments I always give my students.” [emphasis added]

When the discontinuities referred to encountered differences between practices, they were often evaluated

in terms of the university teachers' perceived fit with the new practice. When such a fit was experienced, for whatever reason, the participation in the new practice was experienced as positively; not in spite of, but because of the discontinuity, as it entailed (horizontal) development. Christine described the laborious work of analyzing in week 6:

“Although in some ways examining the data somewhat resembles the work of a Monk, [...] I was pleasantly surprised by the pleasure I took in meticulously examining the texts.”

When a lack of fit was experienced, for whatever reason, the participation in the new culture was experienced as problematic. Erica described feeling this lack of fit resulting from her inability to enact her intentions, which she considered to be a crucial component of teaching, in week 3:

“Really acting out my intentions, sometimes even things I thought of two minutes beforehand, I find very difficult. When I then start talking, I forget all preparation and I respond to whatever comes from the students. This is partly a challenge or learning goal, but it also really feels like failing.”

Other discontinuities were not so much related to the differences between the two practices themselves, but to the position the university teachers had in these practices. For Christine, who was already an experienced educator when she started to conduct research, and thereby became a novice again, this theme emerged in week 22:

“In interacting with Peter I noticed how I feel in talking to him about the standards for teacher educators and the procedure towards it and how it is talking to him about research. In the first case, I feel more at ease and I can also really speak from my own experience and opinion. As soon as it concerns research, I really feel much more like a junior who is suddenly talking to a professor of her field of interest.”

Erica also often contemplated the differences between her position in research and teaching practices. She appeared to experience this as more challenging, as in teaching she was being asked to take on more responsibility than in research (week 36):

“[Standing up for my opinion] could easily conflict with my other identity as a PhD, where sometimes it is expected that I acknowledge the superiority of more experienced researchers.”

In general, toward the end of the transition these discontinuities in position across cultures were experienced differently and generally more positively. This appeared to result from an acceptance of these differences and the relief that brings, as Christine's weekly journal in week 40 illustrates:

“I think it has to do with the fact that I now feel I am actually entitled to be in a transition phase. I don't need to be a 'real' researcher yet [...]; being a researcher in training is totally fine as well.”

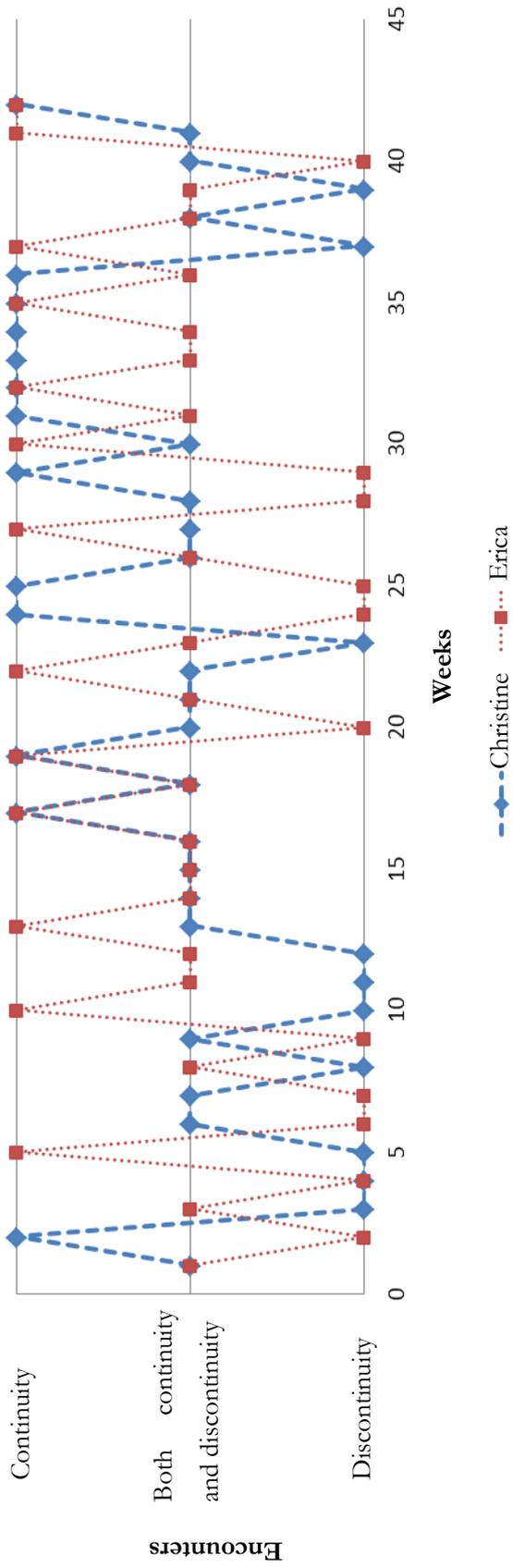


Figure 7.1. Reported encounters of continuity and discontinuity or of discontinuity per week

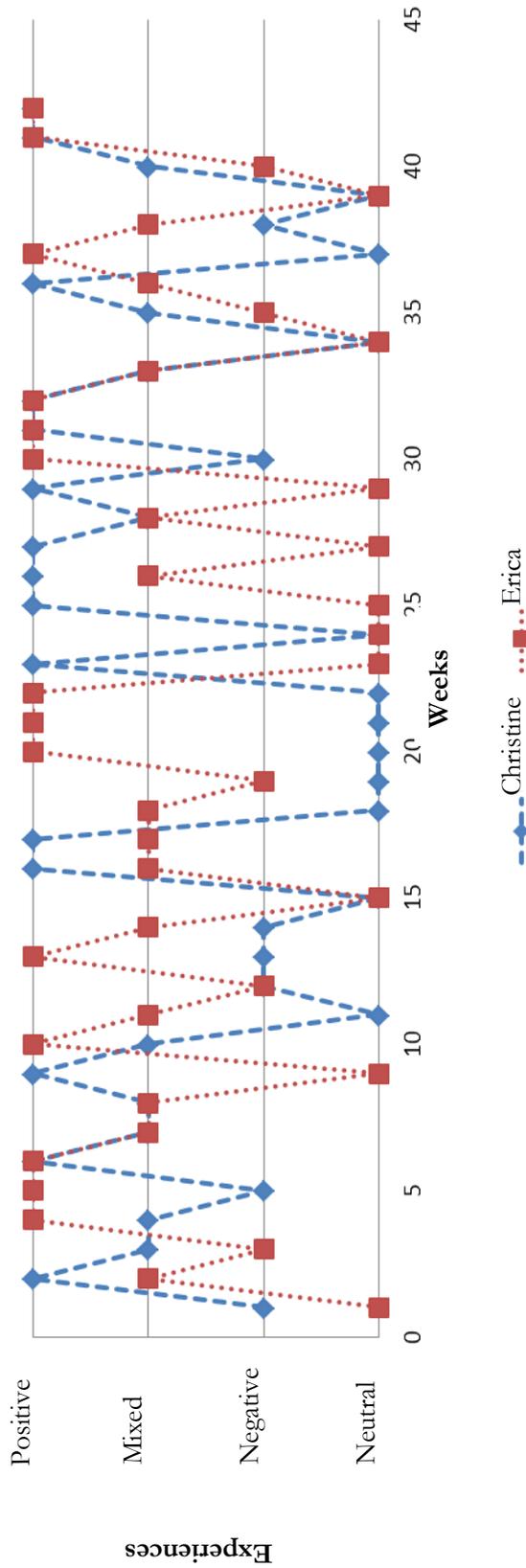


Figure 7.2. Reported positive, negative, mixed or neutral experiences per week

## Conclusion

We set out to study the continuities and discontinuities two university teachers encountered and experienced as they moved across the boundary of the practice that was familiar to them - in opposite directions. The 84 weekly journals illustrate how collateral transitions between research and teaching are dynamic, non-linear processes, as witnessed by the fact that encounters of continuity and discontinuity are reported throughout all stages of the transition and by the fact that these encounters fluctuate between weeks (cf. Figure 7.1 and 7.2). In fact, most weekly journals describe both continuity and discontinuity. This underscores the importance of using a longitudinal design to really understand a collateral transition's dynamics (cf. Ibarra & Barbulescu, 2010). In our analysis we explored the instances of continuity and discontinuity in more detail to answer our research questions.

Our first research question concerned how *continuity*, defined as (inter)actions prolonged across practices, was encountered and experienced. In 33% of the weekly journals only continuity was described. Moreover, in 44% both continuity and discontinuity were described. Given the fact that research and teaching are seen as different epistemic practices, and the abundance of the use of terms as “gap” and “boundary” in the literature (Broekkamp & Hout-Wolters, 2007; Ball, 1995; Lucas, 2007), the number of weekly journals that contains a description of continuity is higher than expected. Interestingly, in many cases the university teachers themselves were surprised by the encountered continuity. Therefore, our results could be seen as an indication that the “gap” and “boundary” metaphor not only portrays the differences between the research and teaching, but also perpetuates those differences (cf. Tyler, 2009).

Our analysis indicates that encounters of continuity are experienced in different ways. Continuity was experienced positively when it appeared to be effortless; when it was deduced from the actions of others and was therefore understood as a sign of potential fit within the new practice; and when continuity was reestablished. Especially when this reestablished continuity was the result of deliberate efforts (cf. Akkerman & Bakker, 2011) these positive emotions were abundant and a sense of pride appeared to exist. In contrast, when well-known, recurring patterns of behavior were also encountered in the new practice, continuity was experienced quite negatively, as this was behavior the university teachers would like to change regardless of the practice in which it emerges. Therefore, our results invite us to question the preference for continuity or coherence on affective grounds witnessed in the literature (e.g., Ibarra & Barbulescu, 2010). We will return to this issue after discussing our conclusions concerning discontinuity.

Our second research question concerned how *discontinuity*, defined as (inter)actions hampered across practices, was encountered and experienced. In 23% of the weekly journals, only discontinuity was encountered. In general, these discontinuities related to either the encountered sociocultural differences between practices that have been mentioned previously in the literature (Akkerman et al., 2013; Tensaki & Hay, 2004), but also to the differences between the positions the university teachers had within these practices. This indicates that the weekly journals describe challenges within the new practice, moving from

peripheral to full participation (Lave & Wenger, 1991) next to challenges (in moving) across practices.

Interestingly, most encounters of discontinuity were either met without much emotion or experienced with mixed emotions. This contradicts Ibarra and Barbulescu's (2010) finding that the inability to draw a continuous link between old and new selves gives rise to emotional discomfort. In fact, it appeared that when differences could be explicitly identified and characterized, discontinuity was experienced positively. When this was not the case, for instance because the actions and/or interactions in the new practice were puzzling, the encounter was experienced negatively. This mainly had to do with the fact that this led the university teachers to question their perceived fit within the new practice. However, as our study is exploratory, we should also consider the possibility that these contradicting results are, at least partly, the result of using a different research design. We suggest exploring this issue in further research.

All in all, our results support the understanding that discontinuities and boundaries should not necessarily be overcome, not just because they hold potential for learning and development (Akkerman & Bakker, 2011), but also because they are not necessarily experienced as being problematic. Interestingly, encounters of discontinuity that were experienced negatively, were often followed by efforts to reestablish continuity in subsequent weeks. In turn, these efforts appeared to be joined by experiences of pleasure and even pride. Seeing as research on student teacher development also highlights the importance of crises for advancing that development (Meijer, 2011), we could therefore question if these negative experiences do not hold value in itself.

### ***Limitations***

Although we deliberately set out to study two contrasting collateral transitions of two university teachers with a different professional background, age and experience, it turned out that the number of encounters of continuity of discontinuity and how the different encounters are experienced were highly similar. As the differences between the two university teachers were not a central object in our analysis, they received little attention. In future research it might be interesting to take more of the idiosyncratic differences between university teachers into account.

Another potential limitation of our study lies in the fact that creating the weekly journal, necessary to document and understand the collateral transition as it unfolds over time, in itself supports and thereby influences that same transition process (e.g., Alsup, 2006; Hermans & Hermans-Jansen, 1995). Although this effect has been reported to be beneficial, in that self-narratives can be seen as powerful instruments to construct "transition bridges" (Ibarra & Barbulescu, 2010), and we tried to minimize that effect by not directly inferring into (dis)continuities, this may have influenced our findings.

### ***Implications and further research***

Our results have several implications for supporting (university) teachers' collateral transitions between research and teaching. First, in the weekly journals there were several references to how writing the journal helped see things differently. Therefore, our results indicate that self-narrations could be used by teachers,

at universities and other schools, to support their transition process. Second, stressing the “gap” or “boundary” when supporting a collateral transition between research and practice underestimates the experiences of continuity that are likely to be encountered. Moreover, it also appears to perpetuate that gap, as experiences of continuity are often met with surprise and estrangement. As such, we recommend avoiding emphasizing differences over similarities prior to engaging in such a collateral transition to allow the process to unfold naturally. Third, recognition of an “in-between” position in the new practice can bring relief and helps to experience discontinuities and a potential lack of fit in the new practice more positively. Encouraging the explication and acceptance of such a position can be a powerful tool to support (university) teachers in their transition (cf. van Rijswijk, Akkerman, & Koster, in press).

In terms of avenues for further research we agree with Akkerman and Bakker (2011), who argued that the field of learning sciences would benefit from extending its scope. Next to our fields’ traditional focus on vertical learning processes within practices, our analysis of university teachers’ collateral transition between research and teaching supports the plea to also include a focus on horizontal learning across practices. In our study, the encounters of continuity and discontinuity across teaching and research and how they were experienced, appeared to result from both horizontal as well as vertical development. Therefore, we suggest that we as a field would benefit from research that not only acknowledges the importance of both vertical and horizontal learning and development in collateral transitions, but that also includes both processes in their analyses. This will afford an increased understanding of collateral transitions that does justice to the complexity of university teachers’ experiences.



## Chapter 8 Conclusion and discussion

In this chapter, we start by answering our two research questions through a synthesis of the findings reported in the individual chapters. Then, we look back at the choices we have made; in terms of the assumptions that underpinned our studies and the research designs and methods we selected to answer them, as well as the consequences of these choices. We then move on to look forward to what our studies may bring to others by offering implications for research-based teacher education.

### Synthesis of the findings

#### *Increased understanding of fostering meaning-oriented learning and deliberate practice*

In this dissertation we set out to explore how research into teacher education can benefit from interactions between research and teaching. We first explored this in terms of substantive findings and questioned *how interactions between research and teaching in teacher education benefit research*. We explored this question in the context of university-based dual teacher education program, focusing on fostering student teachers' meaning-oriented learning and deliberate practice. Based on our results, the main outcome that can be realized by research and teaching interactions is the increased insight into to *complexity* and *interrelatedness* of concepts and processes - discussed by different schools of thought or considered to be beyond the scope of the research. We demonstrate this answer by synthesizing our findings on fostering meaning-oriented learning and deliberate practice in teacher education.

#### *Meaning-oriented learning*

At the start of our studies, meaning-oriented learning was already a well-known concept in research into student learning in higher education (Vermunt & Vermetten, 2004) and it found its place in research on teacher learning as well (Vermunt & Endedijk, 2011). In both contexts, meaning-oriented learning is linked to higher quality learning outcomes (Baeten et al., 2010; Bakkenes et al., 2010). The expert educators interviewed in chapter 2 supported our preference for meaning-oriented learning in learning to teach. The experts' understanding of meaning-oriented learning was comparable with the literature (Endedijk & Vermunt, 2012; Oosterheert & Vermunt, 2001; Vermunt & Endedijk, 2011), although the experts drew attention to the highly personal nature of this process, in accordance with recent literature on teacher professional identity (Akkerman & Meijer, 2011). Integrating expert educators' expertise and the existing literature, we defined meaning-oriented learning to teach as *learning to teach by developing an informed, personal theory of practice*.

When introducing the term in the context of teacher education, Oosterheert (2001) emphasized how meaning-oriented learning in teacher education differs from meaning-oriented learning in other programs in higher education that have a less direct link to a profession. In other higher education

programs, a performance-orientation has been singled out as a distinctive learning pattern, which can be contrasted with a meaning-orientation. Yet in learning to teach, a performance-orientation is always present, as in learning to teach, procedural or practical knowledge of teaching - “what to do in the next lesson” - is always a primary concern (Lampert, 2010). According to the expert teacher educators consulted in chapter two, student teachers need to learn how to learn as a teacher, while at the same time learning how to teach (cf. Hagger et al., 2008).

Existing models of how learning environments and teaching influence the nature of learning (e.g., Baeten et al., 2010), did not take this added complexity into account. However, our in-depth case studies reported in chapter 6 indicate that this distinction can be consequential for learning and teaching in teacher education. Student teachers who were accustomed to meaning-oriented learning in history degrees programs – which they considered to be “scientific” - struggled with pedagogies that were designed to stimulate meaning-oriented learning in teacher education – which they considered (too) “school-like”. A conceptual contribution of this dissertation to the literature on meaning-oriented learning therefore lies in this “recontextualization” of meaning-oriented learning in the context of teacher education (van Oers, 1998a), which is necessary for concepts to become meaningful and in so doing, to have a bearing on practices (Bronkhorst, Baartman, & Stokking, 2012; van Oers, 1998b). Teacher educators, student teachers as well as researchers would benefit from making the distinction between meaning-oriented *studying* in higher education programs and meaning-oriented *learning* in dual teacher education programs – and perhaps other types of professional education – more explicitly.

### *Deliberate practice*

To do justice to the importance of performance in learning to teach (in line with, among others, Fairbanks et al., 2010), we argued that meaning-oriented learning, when focused on understanding, needs to be completed with *deliberate practice* – focused on doing. Although deliberate practice has been advanced as the distinguishing factor in expertise development (Berliner, 2001; Ericsson, 2004; Ericsson, 2006; Guest, Regehr, & Tiberius, 2001), it has hardly been studied in the context of teaching, let alone teacher education. As such, more of a conceptual development is visible throughout the thesis.

In chapter 2 we found that expert teacher educators distinguished between an enactment and a regulation conceptualization of deliberate practice in teaching. The distinction between these two conceptualizations of deliberate practice lies in the *objective* of deliberation. In the *enactment conceptualization of deliberate practice* student teachers put their intentions – based on an explicit theory of practice – into action to benefit pupil learning. In the *regulation conceptualization of deliberate practice* student teachers seek and/or create optimally educative practice experiences for self-improvement. Naturally, student teachers consider their pupils in designing their teaching, yet in the accepted deliberate practice framework, self-improvement is advanced as the sole motivation to engage in deliberate practice. As an alternative to favoring one conceptualization over another on theoretical grounds, we postulated that empirical

explorations might shed light on the role they both may play in student teachers' learning and development and/or how they might even reinforce each other.

An in-depth analysis of student teachers' learning activities from a deliberate practice perspective in chapter 3 indicated that the motivation to engage in deliberate practice could include enhancing pupils next to student teachers' own learning, sometimes even at the same time. Given that similar findings are reported in the literature, as for physicians patient care was also found to be a primary trigger for engaging in deliberate practice, next to self-improvement (Van De Wiel et al., 2011), we came to define deliberate practice in learning to teach as *the continuous progressive refinement of core professional activities, that are intended to foster either the performance of the teacher or of the student, and which build on contextual affordances*.<sup>10</sup>

Although deliberate practice is considered necessary for expertise development, the results of chapter 3 indicated that other vitally important learning outcomes - for instance concerning identity development and pedagogical beliefs - are less likely to be realized through deliberate practice. However, past research has indicated the importance of such learning outcomes for becoming a teacher (Pillen, Beijaard, & Brok, 2012; Rodgers & Scott, 2008; van Rijswijk et al., in press) and for continuing to learn as a teacher (Woldman, Vermunt, Bronkhorst, & Brekelmans, submitted). This finding reaffirms our understanding of deliberate practice as necessary but not as sufficient for student teacher development.

The contribution of this dissertation to the literature on deliberate practice therefore also lies in its recontextualization, even though this appears to add to its complexity. Given that deliberate practice originated in a different domain and it was previously studied in different contexts, one could question if its current application to teacher education is perhaps an overgeneralization. In discussing interdisciplinary use of concepts, Bal (2009) argued that concepts from dissimilar disciplines should be used neither rigidly, nor sloppily, implying that they should retain the spirit of their original meaning, but should remain distinctive enough and should not convey meaning that is captured (in a better way) by other concepts (Smit et al., 2012). Seeing as we concluded in chapter 4 that recontextualizing may be necessary and even more powerful to foster deliberate practice in a way that matches course objectives, we think that our understanding of deliberate practice and particularly this differentiation between conceptualizations retains the strengths of the concept and is not better captured by other concepts.

The apparently close connection between meaning-oriented learning, focusing on developing a theory of practice, and the enactment conceptualization of deliberate practice, focusing on its enactment, is particularly interesting in this respect. Enacting a theory of practice was not, however, part of the existing definition of meaning-oriented learning, as it focused mainly on retrospective rather than anticipatory reflection (Oosterheert & Vermunt, 2001). Apparently, meaning-oriented learning and deliberate practice are more interrelated than disparate theoretical schools would suggest.

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<sup>10</sup> The focus on activities instead of individual student teachers in this definition, is informed by a multilevel analysis of student teachers learning activities (reported with the instrument described in chapter 3), which indicated that most variance was located on the activity level (Boevé et al., in preparation)

*Fostering meaning-oriented learning and deliberate practice in teacher education*

We also encountered such interrelatedness in our efforts to increase our understanding of how we could *foster meaning-oriented learning and deliberate practice in teacher education*. We first transformed the expert teacher educators' expertise on this topic in twelve design principles as described in chapter 2. We subsequently compared these principles to the existing literature and found that the notions reified in these principles effectively integrated ideas, which had previously been scattered across the literature, and which added to the literature in important ways. Although the pedagogies mentioned in relation to these design principles were not new, their connection to meaning-oriented learning and deliberate practice was. Hence, chapter 2 showed that pedagogies used commonly in teacher education programs also impact the nature of learning and may foster, or deter, from meaning-oriented learning and deliberate practice.

Other design principles challenged us to redefine key concepts in teacher education, as they broaden our conceptions of reflection, modeling and powerful learning environments. Pedagogies focused on reflection were expanded to include not only retrospection, but also anticipation of future teaching and learning opportunities. Teacher educator modeling was understood to include modeling learning, as well as teaching. Powerful learning during internships was seen as the outcome of interplay of given circumstances and student teacher agency, also referred to as affordances in workplace learning literature (Billett, 2001b). Therefore, institute teacher educators should optimize such learning through their pedagogy – elaborating on research on “pedagogies of practice” (Grossman et al., 2009).

In chapter 4 we intended to elaborate on the notions represented in these design principles in existing teacher education curricula, by engaging in two parallel formative interventions. By collaboratively reflecting on mirror data - ethnographic data from the lessons - and using the design principles as tools to meet course objectives (i.e. in object-oriented activity; Eri, 2012), the teams of educators and the researcher-interventionist tried to foster student teachers' meaning-oriented learning and deliberate practice. Throughout the year, we discovered how educators sought opportunities to *capitalize on second-order teaching* to stimulate meaning-oriented learning and deliberate practice, thereby broadening the existing understanding of modeling by introducing *meta-questioning*. In this chapter, we also discovered that fostering meaning-oriented learning and deliberate practice in existing curricula was experienced as being quite challenging by the educators when student teachers' preferences for learning – in terms of content and pedagogy – were not in line with meaning-oriented learning and deliberate practice. Consistent with how this issue was treated by the educators throughout the formative intervention, we conceptualized this issue in terms of a *tension*: being pulled in different directions by competing pedagogical demands (Berry, 2007). The teams of teacher educators sought to manage this tension in different ways: either by *requiring* via assignments or by *seducing* via instructional conversations – in line with the objectives of their course as well as their understanding of student teacher learning.

These insights were well beyond the intended scope of our research, as initially only a refinement of the design principles was anticipated. They can be seen as a reminder that, although in general different student teachers in different phases of their development require different pedagogical approaches, the

approach chosen should also be in line with the educational context at hand (cf. Vermunt, Bronkhorst, & Martinez-Fernandez, in press), including the objectives of a course and educators' theories on learning and teaching.

Throughout these studies, the interactions between research and teaching benefitted our understanding of fostering student teacher learning by illustrating the *complexity* of this process within teacher education, as well as the highly diverse ways in which this was *interrelated* with other concepts and processes. Not uncommonly, interrelated concepts are discussed by different schools of thought or are considered to be beyond the scope of the research. Our findings therefore corroborate the assumption that interactions between research and teaching can provide unique and innovative perspectives that benefit research, in terms of confidence in the truth value and neutrality of the research. Additionally, and somewhat contrary to our expectations, our efforts at contextualizing gave us increased insight into the interrelatedness, which in turn benefits the applicability of the findings in other settings.

### ***Conditions for interactions between research and teaching***

“By definition, the collaborative, dialogic approach opens the research topic itself to variation and skewing, in turn influencing further studies” (Kershner & Hargreaves, 2012, p. 291).

As our inquiry progressed, the interaction between research and teaching shifted from being a methodological tool in the first part – designed to increase our understanding of how meaning-oriented learning and deliberate practice can be fostered in teacher education – to becoming the object of study in the second part of this dissertation. This shift was intended to afford a more elaborate exploration of our second research question, namely *under what conditions can interactions between research and teaching in teacher education benefit research?* Based on our studies, we argue that these conditions include: attending to discontinuities, showing engagement, openness to learn, and valuing expertise equally. These conditions elaborate on and extend the three recommendations mentioned by Rickinson, Sebba and Edwards (2011), which we described in chapter 1. We demonstrate our answer by synthesizing the findings of the different studies in which interactions between research and teaching were either a methodological tool or the object of inquiry and analysis.

The different studies of this dissertation signal to the importance of *attending to discontinuities*. This condition elaborates on the first recommendation by Rickinson, Sebba and Edwards (2011), to acknowledge and weave together different purposes of the research for different participants, in three specific ways. First, our results indicate that more than the purpose of the research can be experienced as being different, as discontinuities in discourse and expectations were also found in our studies. Second, by using discontinuity instead of difference, we highlight that not all (predefined) differences are experienced as discontinuity in action and interaction, as our results show how throughout the different studies continuity was also often encountered. For example, although in this thesis research and teaching appeared to operate on different times scales, reinforcing the image of research as time-consuming and of teaching as instantaneous, this did not appear to make the interactions between research and teaching

challenging – in contrast to the second recommendation by Rickinson and colleagues (2011) to plan for different time scales. Therefore, we suggest that only those differences between the epistemic cultures that are experienced as discontinuous require attending to. Third, attending to discontinuities does not necessarily entail overcoming discontinuities, as some discontinuities in action and interaction can be seen as positive, whereas others may appear to be more problematic. For instance, chapter 5 indicates that both the researcher and the educators felt that actual benefit of this particular interaction could be found in differences in expertise and that this could only be exploited by exploring these differences. However, the researcher and educator needed to develop a shared discourse in order to do this. Similarly, one of the student teachers in chapter 6 who actively voiced resistance to the pedagogy of the teacher education program appeared to benefit from dealing with the different cultures of learning and teaching, whereas for the other student teacher the differences in expectations of the different cultures led to disidentification and disengagement. In chapter 7 it appeared that when discontinuities are encountered, they were experienced as positive when the differences could be explicitly identified and characterized – thereby reestablishing a sense of continuity.

As such, we can conclude that interactions between research and teaching can profit from maintaining differences in terms of expertise and purpose, when coupled with a sense of sameness, for instance by developing a shared discourse, in line with the research into interdisciplinary collaboration (Akkerman et al., 2012). Therefore, we would argue that all the discontinuities should be attended to, yet only some need to be actively managed. This is in line with Sandoval and Reiser (2004), who also stress that: “there is no need to do away with those clashes and tensions that spark creativity and learning— only the misconceptions that develop distrust and misunderstanding must be cleared out.” (p. 241).

The second condition that surfaces from our studies is the importance of *showing engagement*. This is similar to the third recommendation by Rickinson and colleagues (2011), which concerned developing expertise in maintaining engagement in and with the research. In a sense, they located the responsibility for ensuring engagement with the researcher, yet his own engagement was not explicitly discussed. Our studies indicate that engagement and the responsibility for it should extend to all the parties involved and that it is important to show engagement. For instance, in chapter 5 we found that it was as important for the researcher to show her engagement by questioning and doubting as it was for the educators to show engagement by exerting agency over the research. This also indicates that there are different ways to show engagement. Similarly, in chapter 7, the lack of engagement in the new practice was experienced as being problematic by both the researcher and the educator. In chapter 6 the importance of engagement came to the fore in the two diverse ways of dealing with friction or discontinuity that gave rise to resistance. One of these, disidentification, entailed the somewhat private abandonment of the goals corresponding to one practice, whereas the other way of resisting, showing active resistance, involved the adoption of an explicitly negative stance towards these goals. Although the study was exploratory, the outcomes of actively resisting (i.e. showing engagement), were profoundly different and more positive than those of

disidentifying. As such, this indicates that showing engagement does not necessarily only entail being positive, as explicitly voicing struggles or doubts also signals involvement.

Two other conditions were also found to be of importance. Our understanding of interactions included how different people or things act upon one another to produce a new effect. Therefore, unexpectancies were expected, appreciated and promoted in our research designs. However, this in itself turned out to be of importance, as in chapter 5 we found that the researcher's willingness to learn and adapt the research design accordingly, was very important for the educators' engagement in and contribution to the research. Also in chapter 6, the educator's openness to alternative ways of designing a portfolio paved the way for the student teachers' active resistance to become constructive. In chapter 7, discontinuities that were unexpected, were often met with positive feelings. As such, a general *openness to learn* seems to be important in order to benefit from interactions between research and teaching.

Generally, in the literature such openness to learn applies to educators as their professional development is often the goal of the interactions between research and teaching (Cobb et al., 2009; Penuel et al., 2007). In contrast, a researcher's openness to learn is referred to as a deviation from the initial design and is sometimes seen as a sign of weaknesses in that design (Eri, 2012). In formative intervention literature, deviations from the intentions of research are traditionally valued as important sources of practitioners' agency and innovation (Engeström & Sannino, 2010; Engeström et al., 2012), yet generally, there appears to be little recognition that the researcher is developing or learning as well, nor recognition for the impact that this learning can have on the interaction between research and teaching. In recognizing both the impact and the importance of this openness to learn, we should develop more flexible research design that can accommodate unexpected findings.

A last condition under which interactions between research and teaching can be(come) beneficial for research, is *equally valuing the expertise of each practice* (cf. Kershner & Hargreaves, 2012). This builds on a warning by Ball (1995) that: "nothing ensures that the interactions in collaborative work [...] will challenge the traditional roles of knowledge production and application. Getting [...] teachers and university people connected is one step. A bigger step is to deconstruct the epistemological divide between research and practice in teaching and learning to teach" (p. 359). This divide partly results from the fact that the knowledge of research is generally viewed as the more authoritative source of knowledge about teaching (Zeichner, 2010). In all of our studies, the appreciation for the expertise of teaching as equal – but different - to that of research, is conditional for the interactions between research and teaching to benefit research. This became manifest in the outcomes of several studies, as our appreciation for the expertise of expert teacher educators (chapter 2) and for the complexity of learning activities undertaken by student teachers (chapter 3) led us to proposing a recontextualized definition of deliberate practice. Moreover, our appreciation of teacher educators' expertise (chapter 4) enabled us to identify a main tension as well as an important possibility of stimulating meaning-oriented learning and deliberate practice. Making sure that the portfolio design would meet the different norms expressed by the different cultures of learning and teaching made the creation of an innovative solution possible (chapter 6).

The educators in chapter 5 showed the importance of this condition by explaining what happens otherwise, when researchers “teach you” and inform you of what you “should do” and when you should not “embarrass yourself by saying something” or “meddle with giving meaning” as that requires “a great deal of researcher knowledge”. According to these educators, this is the reason why “research in the teacher education program is not always received well”. We would like to add that it is likely that this not only impedes the interactions between research and teaching to benefit teaching, but also impedes their benefit to research.

### **Looking back: reflection on assumptions**

“At the risk of oversimplifying the issues, and from a squarely constructivist perspective, one reason there is a gap between scholars and practitioners, between research and practice, is because we say there is a gap” (Tyler, 2009, p. 527)

In striving for transparency, we explicated the assumptions, informed by bodies of literature, which underpinned our studies in chapter 1. Building on work by Knorr-Cetina (1999) on epistemic cultures, we assumed that teaching and research are different epistemic practices, with their own history and practices. As a result, interactions between research and teaching were expected to give rise to discontinuities, as a “boundary” can be experienced between epistemic practices (Akkerman & Bakker, 2011; Tyler, 2009). However, in order for research to capitalize on these discontinuities in ways that benefit research, we assumed the interactions between research and teaching should be seen and shaped as reciprocal interactions, building on third generation CHAT theories (Engeström & Sannino, 2010; Roth & Lee, 2007) and work on user engagement (Rickinson et al., 2011). Clearly, these assumptions are not without consequences. We feel it is important to discuss the (potential) consequences of our assumptions, as they can be relevant for other researchers.

Tyler (2009) pointed out that the understanding of research and teaching as different epistemic practices might reconstruct the boundary between them, as this categorization “both emerges from and perpetuates distinctions between members in the community and the work that they undertake.” (p. 526). Understanding research and teaching as different practices essentially categorizes them in a specific way, which is in line with research findings thus far, yet simultaneously limits and controls our perception (Hager & Hodkinson, 2009). As a consequence of categorizing, one can generalize, but at the same time differences are reinforced (Pierik, 2004). This “self-defeating” mechanism has been found to occur in a study on dialogues between academics and practitioners (Beech, MacIntosh, & MacLean, 2010) and may also play a role in this dissertation. At least for the actors involved in our studies, expectations about “the other” appeared to shape actions and interactions. For instance, our analysis in chapter 7 indicated that this mechanism might be at play, as continuity between research and teaching was sometimes met with surprise. In the interactions between the researcher and the educators in chapters 4 and especially 5, we also found indications of expected differences in knowledge, expertise and way of working. Moreover, in

our analysis of various data sources, the expectation of differences might have led us to recognize differences and neglect similarities. Even though some frame of reference is always employed in the analysis to reduce the data (Hodkinson, 2004), and the culturally and historically developed differences between research and teaching are well-documented, the fact that research and teaching were defined as different a priori may have limited our perspective.

Similarly, in assuming interactions between research and teaching to be beneficial for research, one is perhaps more likely to detect findings that support this assumption. The null hypothesis, so to speak, stating that research does not benefit from interactions between research and teaching, might therefore be (too) easily rejected. Therefore, we have tried to deal with this assumption thoughtfully, by formulating more concrete expectations as to what this benefit could entail and how it could come about, in line with recommendations on informative hypotheses – which are normally used in more confirmatory research designs (van Wesel, Boeije, & Hoijsink, 2013). In fact, this limitation may also be true the other way around: by not considering the option that research may benefit from interactions between research and teaching or by only considering the disadvantages of doing so – as some researchers appear to do (Engeström, 2011), in spite of emerging findings that contradict this assumption – it is perhaps not surprising that the body of literature on the benefits of interactions between research and teaching is only in its infancy.

Some of our assumptions remained more implicit, but are also consequential. We felt that the benefit of interactions between research and teaching for teaching had been well-established in the literature (e.g., Cobb et al., 2009; Kansanen, 2005; Lassiter, 2008; Meijer et al., 2012; Penuel et al., 2007). Therefore, we did not pay explicit attention to how teaching may benefit from these interactions in our analysis, although the issue is touched upon in chapters 4, 5 and 7. In chapter 4, both pairs of educators mentioned repeatedly how the presence of the researcher-interventionist and different aspects of the research design made them more conscious of their teaching. Additionally, for the subject matter group the mirror data – part of the research design - became one of the main tools for stimulating student teachers' meaning-oriented learning and deliberate practice. In chapter 5, the educators explain how the continuous interactions with the research perspective afforded an in-depth analysis of their practice and explication of their knowledge as well as a stimulus to further develop their knowledge and practice (see for a more elaborate description Bronkhorst, van Rijswijk, & Suijker, 2012). In chapter 7, the intrapersonal interactions between research and teaching led to, among others things, developing a special way of coding (using images) and to designing conferences presentations using pedagogical tools. As such, it appears that the interactions between research and teaching can be consequential in a positive sense for *both* research and teaching.

Lastly, in the different studies, we considered theories, a researcher(-interventionist), a learning culture described as “scientific” and an I-position as a researcher to be different manifestations of the epistemic practice of research. Similarly, we considered (expert) teacher educators' knowledge, student teachers actions, teacher educators, a learning culture described as “school-like” and an I-position as

educator to be different manifestations of the epistemic practice of teaching. All these studies are assumed to be accounts of the same phenomenon, namely interactions between research and teaching in teacher education, even though these interactions thus take different forms and take place on different levels of teacher education. We hope to explore in further research if this is perhaps an overgeneralization, or in fact the same phenomenon at different levels of analysis.

## **Looking back: reflection on methodology**

### *Research designs*

Our argumentative grammar or “the logic that guides the use of a method and that supports reasoning about its data” (Kelly, 2004, p. 118) followed from these assumptions. Our understanding of interactions as being *reciprocal* and of *potential benefit to research* was the most significant implication for the research approach chosen. Interestingly, in the literature on teacher education and elsewhere, these two aims appeared to be at odds as “the application of reciprocity is often located in action research, aimed *primarily at solving in-practice problems and generating knowledge at a local level*” (Trainor & Bouchard, 2012, p. 3 emphasis added). In our studies, we explicitly sought reciprocity to solve research problems at a conceptual level and to generate knowledge that could be used in other settings. Finding appropriate research designs was, therefore, quite a challenge.

We considered a variety of different research approaches that could potentially match our assumptions and meet our goals. We explored design research (e.g., Cobb et al., 2003; Collins, Joseph, & Bielaczyc, 2004), participatory action research (e.g., Almekinders et al., 2009; Wimpenny, 2010), collaborative ethnography (Lassiter, 2008) and responsive or realistic evaluation (Pawson & Tilley, 1997; Stake, 1975). The underlying reasoning of these approaches seems similar, as in all of these approaches, development is an explicit aim, either in terms of the learning of the practitioners involved, or in terms of the design and development of a tool. Representatives of the epistemic practice of teaching are purposefully involved in the design, implementation and/or evaluation of a suitable intervention to address the development aimed for, and sometimes also in shaping the research design itself, to profit from their expertise and knowledge (Könings et al., 2007).

However, we felt there were only a few research approaches that explicitly acknowledge that “it is not at all clear just what needs to be learned” (Engeström, 2011, p. 599) in exploring complex issues – thereby letting go of some of the control research normally holds on to. Moreover, only a few approaches “in different ways take advantage of the contributions that participants besides researchers provide to the joint endeavor” (Sutter, 2011, p. 702) – by sustaining reciprocal interactions between research and teaching. Similarly, Rickinson, Sebba and Edwards (2011) found that research approaches pursuing interactions between research and teaching differed in terms of who controlled the research and where and how the boundaries between research and teaching were drawn. Moving from control by research to teaching and from firm to blurred boundaries, they mention five categories: creating feedback loops,

university-led participatory research, combining small scale studies, co-research for conceptual development and user-led research. We purposefully tried out research designs that fell within different categories, moving from researcher's control to co-regulation of the research and from firm to blurred boundaries between research and teaching in the different studies in this dissertation.

In terms of methodology, in the studies reported in chapters 2,3 and 6 the interaction between research and teaching can be considered “university-led participatory research” by Rickinson and colleagues (2011) as they entailed deliberately seeking feedback on ideas developed in research. The research designs in these chapters merely required an adaptation of existing and well accepted research methods. As a result, we relied on an open interview scheme – in line with recommendations on interviewing experts (Bogner, Littig, & Menz, 2009) – in chapter 2 and explored two outliers in more details than the “average student” in chapter 6. The main adaptation of our research design can be located in our analysis. Our conceptual framework, which stemmed from research, was deliberately not used in a normative way, but as a conceptual lens. As a result, evaluative statements about the “accuracy” of expert teacher educators’ understanding – compared to literature – were not part of the conclusion of chapter 2. Similarly, if student teachers showed “sufficient” deliberate practice was not a primary object of analysis in chapter 3. In contrast, student teachers’ resistance to the pedagogies developed in the formative intervention were met with interest in chapter 6, triggering a conceptual exploration of the concept of resistance. In light of these explorations, we would argue that research into (teacher) education could benefit from focusing less on “evaluating” teaching with research norms, as this tends to reveal what teaching does not do, instead of what is being done in teaching and how.

In letting go of more of the researcher's control and blurring the boundaries between research and teaching, for the studies reported in chapters 4 and 5 we relied on what Rickinson and colleagues (2011) refer to as “co-research for conceptual development”; an approach that aims to develop and refine concepts to increase understanding and development of changing practices. To that end, we adapted a research approach that is less known in research on teacher education, namely “formative intervention” (Engeström & Sannino, 2010; Engeström, 2011; Sannino & Sutter, 2011). A formative intervention is an emergent intervention designed to promote change in work and educational practices as a result of *and* at the same time with the aim to fostering innovative ideas and new conceptual understandings. As such, the outcomes of formative intervention are never completely specified beforehand. Moreover, educators and other practitioners are deliberately not seen as “passive executors” of a predefined intervention design, but as active agents, with valuable knowledge and expertise. We knew that formative interventions are seen as quite unique in this respect as “traditionally educational researchers do not necessarily value substantive research findings, developed in interaction with teaching, beyond the contexts in which they are produced and embedded” (Kershner & Hargreaves, 2012, p. 279).

Nevertheless, it turned out that even the formative intervention design required some adaptation to support researchers and educators to collaboratively work on a shared goal or object, as this would allow them to really take advantage of the differences in expertise (Sutter, 2011). We will discuss these

adaptations in relation to the role of the researcher in the following section. Generally, we hope our research contributes to the further adoption and adaptation of formative research designs in research on teacher education.

In our last empirical chapter, the boundaries between research and teaching became even harder to identify in our research design, as here we relied on an emerging methodology in research on teacher education, namely self-study (LaBoskey, 2004; Loughran, 2007; Lunenberg, Zwart, & Korthagen, 2010). This could be seen as belonging to the category of research approaches labeled as “user-led research” (Rickinson et al., 2011), even though the users in this specific case were a researcher and an educator. We deliberately choose to engage in this type of research, as self-study research has been developed to facilitate interpersonal interactions between research and teaching, albeit to benefit teaching (LaBoskey, 2004; Loughran, 2007). Through our analysis of the collateral transitions between research and teaching – in opposite directions – in chapter 7, we hope to have demonstrated the benefits for research as well, especially since self-study research is sometimes criticized in that respect (Zeichner, 2007).

As such, in the studies described in this dissertation, we used different research approaches, instruments and analysis strategies, some of which are still in the early stages of development. Considering that, we understand the shift in object of research that occurred in this dissertation as a consequence of letting go of some of the researcher’s control and moving across the boundaries of research and teaching in our research designs. Even though in every chapter we hope to have made the methodological choices plausible, we are well aware that different choices could have been made, with implications for our findings. Some important questions remain unanswered due to the design of the studies. For instance, in chapters 2 and 4, meaning-oriented learning and deliberate practice, as well as the design principles, were studied in an integrated fashion. Consequently, our studies do not afford statements about individual concepts or standalone principles. Additionally, questions about the effects of enacting the design principles on student teachers’ meaning-oriented learning and deliberate practice in chapter 4 require a different design. Although our research designs are in line with the exploratory aims of our research, different, more confirmatory research designs are necessary to extend the findings presented in this dissertation.

### ***Role of the researcher***

As a result of these choices in research designs, the “we” and “I” do not have the traditional role in this dissertation, which is why *my role as a researcher* deserves some more attention. As we aimed to study interactions between research and teaching, the implication was that I, as the principal researcher, would interact with different representatives of teaching. For me personally, it also followed naturally that I therefore would study myself as well as studying others.

In chapter 4, I acted as a researcher-interventionist in an adaptation of a formative intervention methodology – in which the researcher and the educators work on a shared object (Sutter, 2011) - and choose to study the consequences of my own actions in chapter 5. This resulted from the fact that even though Engeström (2011), who coined the term formative intervention research, argues that some

researchers downplay the role of educators (or other practitioners) in writing up their studies, we discovered that in the literature on formative interventions, the role of the researcher had tended to receive little attention in the analysis and documentation of the research.

Based on the results of chapter 4, we argue that in general the role of the researcher should not be *underestimated* in interactions between research and teaching, as our results illustrated the different ways in which the educators benefitted from the research in terms of broadened (conceptual) understanding and change in practice. The position I as a researcher assumed in this process – in this case, a position as learner – also turned out to be important, as our analysis in chapter 5 indicated that this position was important for the educators' engagement. As the educators' engagement, in turn, was found to benefit the truth value, neutrality and, to some extent, the applicability of the research, we think it is worthwhile to be aware of this more consciously as a researcher. Research is thus not only a matter of research design, but also a matter of a researcher's position and the relationships established in interaction.

Chapters 4 and 5 also indicated that my role as a researcher in fostering innovation and developing the understanding in formative interventions should not be *overestimated*. Throughout the formative interventions, the educators stressed how they were significantly influenced by several factors outside the research. These included collaborating with colleagues from different departments, the composition of the student teachers in the classes, the fact that the educators themselves were starting to become engaged in research, and the reification of the formative intervention with other interested parties at symposia. It turned out that my presence as a researcher was only one of many interventions that changed educators' courses of action, a fact which I think deserves more recognition.

Lastly, I also choose to engage in a study in which I was simultaneously the subject and object of research in chapter 7. In this study, I decided – in collaboration with educator Christine – on a theoretical framework, a research design and an appropriate instrument and conducted the analyses to draw conclusions, but I was *also* the one that produced the data. Paradoxically, this is the reverse movement the educators in chapter 4 and 5 experienced: they moved from being a user of knowledge to a creator of knowledge (Meijer et al., 2012), and from being an object to being an agent of investigation (Wagner, 1997). The experience turned out to be quite humbling: when filling in a measurement instrument as an object of study, you are not very concerned with the goals the agent of study might have. One fills it in the midst of many other, often more important, things, unaware of the conclusions the agent might base on it and the implications this might have. Moreover, I also experienced how difficult it turned out to be to continue filling in weekly instruments over the course of an academic year. This led me to appreciate participants in longitudinal designs even more.

In the light of these reflections, it is beyond doubt that I influenced the results of the research. For example, another researcher, with a different background or with different expertise, would have interacted with the educators differently, which would have influenced the findings in chapter 4 and 5. Engeström (2011) argues that this influence is unavoidable in any research design: “Humans – practitioners, teachers, students – are intentional and interactive beings who keep interpreting and

reinterpreting the challenges and tasks they face in their own, multiple, changing, and often unpredictable ways". (p. 599). Based on our studies, I would conclude that in recognizing that the benefit of interactions between research and teaching lies in the practices acting upon each other (in order to produce a new effect), this interaction should not be controlled in the research design, but analyzed as part of the findings. Consequently, researchers should be (more) transparent about our potential influence in writing up our research. Interviewing participants about the consequences of our interactions (chapter 5) and triangulating interpretations of data sources (chapter 4) could be seen as useful additions to established ways of ensuring transparency about these interpersonal interactions.

### **Looking forward: implications for research-based teacher education**

Next to the separate implications for research on and teaching in teacher education, which we discussed in the different chapters, some general implications for research-based teacher education can be drawn based on this dissertation. A first implication concerns the use of the gap metaphor to describe the interactions, or lack thereof, between research and teaching. Based on the studies in this dissertation, we argue that research-based teacher education could benefit from relinquishing the gap metaphor. The use of this metaphor suggests not just a lack of interaction between research and teaching, but an unidentified vacuum located in between two epistemic practices. The metaphor of a borderland is sometimes used in a similar way to denote a piece of no man's land or an unoccupied territory between different worlds (e.g., Bullough et al., 2004). In contrast, the different interactions, taking place at different levels of teacher education that we studied in this dissertation, indicate that the practices of research and teaching intersect and interact directly.

A more important drawback of the gap metaphor is that it implies that closing or overcoming the gap is not only possible, but also desirable (Rafferty et al., 1996). The boundary crossing metaphor more effectively captures the discontinuity that individuals, objects and I-positions can encounter in interactions between research and teaching. Akkerman and Bakker (2011) argue that:

“engagement at the boundary does not mean a fusion of the intersecting social worlds or a dissolving of the boundary. Hence, boundary crossing should not be seen as a process of moving from initial diversity and multiplicity to homogeneity and unity but rather as a process of establishing continuity in a situation of sociocultural difference” (p. 152).

Throughout this dissertation the value of interactions between research and teaching has been located in the differences between the practices. It therefore appears more prudent to maintain some degree of the uniqueness of the intersecting practices, which seems contrary to the assumptions of the gap metaphor.

Second, to be able to capitalize on the differences between research and teaching in various interactions between them, research and teaching should not only remain different, but should also be considered of equal value in promoting student teacher learning. This means that the roles of both

researchers and educators in these interactions need to be redefined (Meijer et al., 2012); *both* need to demonstrate their expertise and show their engagement through exerting agency, as well as be open to learn and change their respective practices. In contrast to popular discourse, this entails that researchers cannot “give” educators agency, but also that educators involved in research need to actively exert agency. Similarly, this implies that researchers should not (only) try to “teach”, but (also) try to learn. This can prove to be challenging, as “teachers [...] may think that researchers are being disingenuous when they claim they want to learn with teachers. And researchers may feel as though they are withholding knowledge and expertise.” (Ball, 1995, p. 360). Therefore, these redefined roles need to be acknowledged and promoted in research designs for research on teacher education.

Lastly, in the past research designs that tried to establish reciprocal interactions between research and teaching have been met with concerns about research quality (Kelly, 2004), as the reduced researcher control begs the question of whether the research can be replicated, and whether the results do not become (too) contextualized (Dede, 2004). Along with the fact that the replication as a way of ensuring reliability may be considered a paradigm dependent (Guba, 1981) and perhaps a somewhat narrow operationalization of the quality criterion consistency, we have also established that reciprocal interactions do not necessarily harm research quality. In contrast, these interactions between research and teaching can add to the truth value, applicability and neutrality of the research undertaken, when the conditions of attending to differences, showing engagement, openness to learn and equaling valuing different expertise are met. Therefore, even though there may be various valid reasons why reciprocal interactions between research and teaching should not be part of a research design, this dissertation has shown that the potential decrease in research quality should no longer be considered one of those reasons.



## Nederlandse samenvatting

De wisselwerking tussen onderzoek en onderwijs bij het opleiden van leraren krijgt op dit moment veel aandacht. Deze wisselwerking wordt vaak als problematisch ervaren en beschreven in termen van een ‘kloof’ die er lijkt te bestaan tussen onderzoek en onderwijs. Er zijn verschillende initiatieven gericht op het overbruggen van deze kloof. Het gaat dan om het organiseren van interacties tussen onderzoek en onderwijs op verschillende vlakken, zoals in academische lerarenopleidingen. In de literatuur wordt dit ook wel *research-based opleiden van leraren* ("research-based teacher education" Kansanen, 2005; Kansanen, 2006) genoemd. In het algemeen wordt aangenomen dat deze interacties meerwaarde kunnen hebben voor onderwijs. De mogelijke meerwaarde van deze interacties voor onderzoek wordt echter sporadisch erkend en slechts door een enkele onderzoeker empirisch onderzocht. In dit proefschrift wordt verkend *wat de meerwaarde zou kunnen zijn van interacties tussen onderzoek en onderwijs voor het onderzoek naar het opleiden van leraren en onder welke condities die meerwaarde gerealiseerd zou kunnen worden.*

In **hoofdstuk 1** introduceren we de aanleiding voor het onderzoek en de aannames die we voorafgaand aan het onderzoek hadden. Op basis van literatuur over epistemologische culturen (Knorr-Cetina, 1999) namen we aan dat onderzoek en onderwijs verschillende sociaal-culturele praktijken vormen, ieder met eigen methoden om kennis te ontwikkelen en te waarderen. Daaruit volgt dat in interacties tussen onderzoek en onderwijs *discontinuïteit* (Akkerman & Bakker, 2011) op kan treden, wat wil zeggen dat interacties moeizaam verlopen of vertraagd worden. Op basis van onderzoek naar grensoverschrijding ("boundary crossing" Engeström et al., 1995; Tuomi-Gröhn & Engeström, 2003) namen we desondanks aan dat deze discontinuïteit ook verrijkend kan zijn; niet alleen voor onderwijs, zoals vaak wordt aangenomen, maar ook voor de kwaliteit van onderzoek. We formuleren de volgende twee onderzoeksvragen: 1) *Wat is de meerwaarde van interacties tussen onderzoek en onderwijs voor onderzoek in de lerarenopleiding?* 2) *Onder welke condities kan deze meerwaarde van interacties tussen onderzoek en onderwijs tot stand komen?*

Aangezien interacties altijd een inhoud hebben ("over iets gaan"), wordt in dit hoofdstuk ook de specifieke context geïntroduceerd, waarin het onderzoek heeft plaatsgevonden, namelijk de universitaire lerarenopleiding, een eenjarige post-master opleiding, die dual wordt vormgegeven. Dit betekent dat leraren in opleiding gelijktijdig les krijgen op de universiteit en ervaring opdoen in de lespraktijk in de vorm van een stage of een baan. In dit onderzoek richten we ons op het universiteitsgedeelte van de opleiding. Een verkenning van de literatuur leert ons dat de aard van het leren van leraren in opleiding meer aandacht verdient. Deze opvatting werd gedeeld aan de lerarenopleiding van de Universiteit Utrecht, waar het gros van onze studies plaatsvond. De opleiding in Utrecht gaat uit van een realistische opleidingsvisie (Korthagen et al., 2001), waarbij ervaringen van leraren in opleiding in de schoolpraktijk als uitgangspunt worden genomen. We maken aannemelijk dat leraren in opleiding, en in het verlengde daarvan de leerlingen aan wie zij lesgeven, zouden kunnen profiteren van betekenisgericht leren

(Oosterheert & Vermunt, 2001) gecombineerd met *deliberate practice* (Ericsson et al., 1993). *Betekenisgericht leren* werd bij aanvang van dit onderzoek opgevat als leren lesgeven door het ontwikkelen van een geïntegreerd en geïnformeerd referentiekader als basis voor handelen in de praktijk en *deliberate practice* als de aansturing van expertiseontwikkeling door doelbewust en doordacht te (blijven) oefenen.

De interacties tussen onderzoek en onderwijs rondom het stimuleren van betekenisgericht leren en *deliberate practice* in de lerarenopleiding krijgen in hoofdstuk 2 en 3 op conceptueel niveau vorm. In **hoofdstuk 2** worden 12 expert lerarenopleiders van verschillende universitaire lerarenopleidingen geïnterviewd. Dit zijn opleiders met meer dan 10 jaar ervaring, die door hun peers als experts worden erkend. In de diepte-interviews komen zowel de definities van de concepten betekenisgericht leren en *deliberate practice*, als manieren om ze te stimuleren in een eenjarige duale lerarenopleiding aan bod. Door middel van open inhoudsanalyse van de uitgeschreven interviews komt naar voren dat de experts bij betekenisgericht leren vooral denken aan leren lesgeven door het ontwikkelen van een persoonlijke praktijktheorie. *Deliberate practice* wordt door de experts op twee verschillende manieren geïnterpreteerd: als *toepassing* van een praktijktheorie gericht op het leren van leerlingen, of als *regulatie* van activiteiten in de school gericht op het eigen leren als leraar (in opleiding).

De verkregen inzichten over het stimuleren van betekenisgericht leren en *deliberate practice* worden omgezet naar twaalf zogeheten ontwerpprincipes: uitgangspunten voor het handelen van opleiders, die gebruikt kunnen worden in het (her)ontwerp van het onderwijs op de lerarenopleiding. Een vergelijking van deze principes met de bestaande literatuur leert ons, dat in de principes ideeën van uiteenlopende literatuurstromingen geïntegreerd worden. Daarnaast ontdekken we dat een aantal concepten uit de literatuur verdiept en verbreed worden door de experts. Zo zien zij reflectie niet alleen als terugkijken op eerdere lessen, maar ook als vooruitkijken op toekomstige lessen. Zij herkennen dat niet alleen het modeleren van lesgeven (“teach as you preach”) krachtig kan zijn in een lerarenopleiding, maar ook het modeleren van het leren als leraar. Als laatste erkennen zij de mogelijkheden van de leraar in opleiding om in meer of mindere mate gebruik te maken van de (bestaande) potentie van zijn werkplek om te leren en te ontwikkelen. Dit impliceert volgens hen dat opleiders de leraren in opleiding kunnen stimuleren om meer uit hun praktijkervaringen te halen.

In **hoofdstuk 3** verkennen we het relatief nieuwe concept *deliberate practice* verder. In de literatuur worden vaak vier kenmerken van *deliberate practice* genoemd: *ontwerp* van de activiteit, *motivatie* om de activiteit *herhaaldelijk* te blijven doen en de noodzaak van onmiddellijke en informatieve *feedback* op de uitvoering (Ericsson, 2004). Op basis van de resultaten van hoofdstuk 2 en de bestaande literatuur over leren lesgeven, spreken we het vermoeden uit dat *deliberate practice* in leren lesgeven wel eens context-specifieke kenmerken zou kunnen aannemen. We analyseren 574 leeractiviteiten, die 63 leraren in opleiding hadden gerapporteerd als betekenisvol voor hun ontwikkeling als leraar aan het begin en het einde van de opleiding. Hieruit blijkt dat het ontwerp van de activiteit niet alleen betrekking kan hebben op de aard van de activiteit zelf (bijv. reflecteren of uitproberen), maar ook op de context waarin de activiteit zou plaatsvinden (bijv. op de (stage)school of op de universiteit). Overeenkomstig onze

bevindingen in hoofdstuk 2 bestaat de motivatie voor de activiteit zowel uit de wens om het leren van leerlingen te stimuleren, als om het eigen leren als leraar in opleiding te bevorderen. Leraren in opleiding rapporteren veel plannen om de activiteiten te herhalen of liever te verfijnen, bijvoorbeeld door het geleerde in een andere klas uit te proberen. Feedback op de activiteit wordt op zeer verschillende manieren verkregen: van begeleiders en mede-stagiaires, maar ook (soms ongevraagd) van leerlingen.

Activiteiten die aan alle vier de kenmerken voldoen en die we dus als *deliberate practice* bestempelen, verschillen van andere activiteiten, die leraren in opleiding ook betekenisvol vonden voor hun ontwikkeling, wat betreft de uitkomst van de activiteit; *deliberate practice* resulteert significant vaker in verhoogde performance, hetgeen correspondeert met de bestaande literatuur. De context waarin en het moment waarop de activiteiten plaatsvinden, verschillen echter niet. We konden ook niet één specifieke activiteit (zoals bijv. reflecteren) aanmerken als *deliberate practice*. Dit laatste is juist in tegenstelling tot de bestaande literatuur. Dus concluderen we dat de kern van *deliberate practice* in leren lesgeven zit in de manier waarop verschillende kernactiviteiten van (leren) lesgeven worden vormgegeven.

In **hoofdstuk 4** bouwen we voort op de kennis uit hoofdstuk 2 en 3, gebruikmakend van interpersoonlijke interacties tussen onderzoek en onderwijs. We vinden twee koppels van lerarenopleiders bereid om, in samenwerking met de hoofdonderzoeker, gedurende een academisch jaar te experimenteren met verschillende manieren om betekenisgericht leren en *deliberate practice* te stimuleren in het bestaande curriculum van hun cursussen. Deze opleiders verzorgen de “vakdidactiegroep” voor 26 leraren in opleiding geschiedenis en de “mentorgroep” voor 12 leraren in opleiding voor de gamma vakken. Bij vakdidactiek gaat het ontwikkelen van kennis en bekwaamheden die specifiek zijn voor het geven van geschiedenis op de middelbare school, terwijl in de mentorgroep juist de ontwikkeling van algemeen didactische kennis en bekwaamheden centraal staat.

De samenwerking tussen de lerarenopleiderskoppels en de onderzoeker wordt vormgegeven als een zogeheten *formatieve interventie* (Engeström, 2011): een interventie gesitueerd in de (complexe) praktijk, die in samenwerking is opgezet, uitgevoerd en geanalyseerd. Het doel van de formatieve interventies is om zowel vernieuwende inzichten als handelingsalternatieven te ontwikkelen. Concreet betekent dit, dat de opleiderskoppels samen met de onderzoeker de tweewekelijkse bijeenkomsten van de mentorgroep en de vakdidactiegroep voorbereiden en evalueren. De twaalf ontwerpprincipes uit hoofdstuk 2 worden gebruikt als conceptueel startmodel, verrijkt met de expertise en ervaring van de opleiders. Ook wordt etnografisch materiaal (zogenoemde “mirror data”) verzameld tijdens de bijeenkomsten van de twee groepen, dat gebruikt werd voor het bediscussiëren van de effecten van de didactiek op de leraren in opleiding.

De open inhoudsanalyse van uitgeschreven start- en eindinterviews, gezamenlijke voorbereidings- en evaluatiegesprekken, lesplannen en de aantekeningen die de onderzoeker bijhield (waarin zij ook de meer informele interacties met de opleiders beschreef) wijst uit dat er twee thema's zijn, die in beide groepen gedurende het jaar een grote rol hebben gespeeld. Het eerste thema betreft de mogelijkheden die “tweede orde lesgeven”(lesgeven over lesgeven) biedt voor het stimuleren van betekenisgericht leren en

deliberate practice, door leraren in opleiding als lerende én als leraar te betrekken bij zowel de inhoud als de didactiek van de bijeenkomsten. Het tweede thema betreft de spanning die ontstaat wanneer de voorkeur van leraren in opleiding inhoudelijk of didactisch niet aansluit bij betekenisgericht leren en/of deliberate practice. De opleiders van de vakdidactiegroep gaan hiermee om, door te *vereisen* dat leraren in opleiding betekenisgericht leren en deliberate practice laten zien, voornamelijk via opdrachten. Een voorbeeld hiervan is de visie op het vak, die de leraren in opleiding aan het begin en eind van de opleiding hebben geschreven en de formatieve toetsing van de literatuur, die de leraren in opleiding geacht worden te lezen. De opleiders van de mentorgroep richten zich meer op het *verleiden* van de leraren in opleiding, opdat de leraren in opleiding de meerwaarde van deze manieren van leren ervaren, voornamelijk door het gesprek met de leraren in opleiding over hun eigen leren aan te gaan. De twee thema's zien we als een verrijking van de ontwerpprincipes, omdat ze de complexiteit van het stimuleren van betekenisgericht leren en deliberate practice laten zien, evenals de verbondenheid met andere (leer)processen.

In de hoofdstukken 5, 6 en 7 verschuiven de interacties tussen onderzoek en onderwijs van een instrument met mogelijke meerwaarde voor onderzoek naar het object van onderzoek. In deze hoofdstukken richten we ons rechtstreeks op *interpersoonlijke* (tussen individuen) en *intrapersoonlijke* (binnen een individu) interacties tussen onderzoek en onderwijs.

In **hoofdstuk 5** verkennen we de consequenties van de samenwerking tussen de onderzoeker en een opleiderskoppel, vormgegeven als formatieve interventie, meer in detail. We beschrijven eerst de punten waarop formatieve interventies volgens de literatuur verschillen van meer traditionele (of lineaire) interventies. Geconcludeerd wordt dat formatieve interventies bewust niet leunen op een geheel door de onderzoeker gecontroleerd onderzoeksdesign, omdat het doel van formatieve interventies juist is gebruik te maken van de expertise van de opleiders, waarvoor handelingsvrijheid nodig is.

Middels een groepsinterview geleid door een externe onderzoeker worden de ervaringen van de lerarenopleiders en de onderzoeker met betrekking tot de samenwerking verkend. Deze retrospectieve data vergelijken we met de aantekeningen die de onderzoeker gedurende de samenwerking had gemaakt. Uit deze data bronnen komen drie contrasten naar voren tussen de beleving van (de samenwerking in) dit onderzoek en eerdere ervaringen van de lerarenopleiders met onderzoek. De lerarenopleiders voelen zich in dit onderzoek aangesproken als *expert* in plaats van instrument (om data te verkrijgen). Zij ervaren de onderzoeker niet als leraar die hen vertelt hoe ze zouden moeten opleiden, maar als *lerende* net als zichzelf. Het onderzoek wordt ervaren als *geïntegreerd* in plaats van als letterlijk en figuurlijk ver verwijderd van hun onderwijspraktijk.

We leggen deze contrasten naast de vier criteria voor onderzoekskwaliteit, zoals beschreven door Guba (1981). We concluderen dat samenwerking in onderzoek, waarin de opleider als expert en de onderzoeker als lerende is gepositioneerd en het onderzoek geïntegreerd is vormgegeven, kan bijdragen aan de waarheidswaarde, de neutraliteit en in zekere zin de toepasbaarheid van onderzoek, ook wel respectievelijk interne validiteit, objectiviteit en generaliseerbaarheid genoemd. Het vierde criterium

consistentie (ook wel betrouwbaarheid genoemd), blijkt lastiger te waarborgen, omdat de onderzoeker bewust geen monopolie meer heeft op de opzet en uitvoering van het onderzoek.

In **hoofdstuk 6** bestuderen we twee bijzondere gevallen (zogenoemde “uitschieters”) uit hoofdstuk 4: twee geschiedenis leraren in opleiding die, anders dan de overige leraren in opleiding, weerstand vertonen tegen de didactiek van de lerarenopleiding. In de lerarenopleidingsliteratuur wordt weerstand tegen didactiek vaak gezien als een negatieve eigenschap, die leren in de weg staat. In andere literatuur wordt echter geopperd dat weerstand ook gezien kan worden als uiting van *fictie*, die kan bijdragen aan leren (Vermunt & Verloop, 1999). Met dit in ons achterhoofd analyseren we de portfolioteksten en de portfoliogesprekken, die deze twee leraren in opleiding voerden met hun opleider. Ons doel was om te verkennen wat de alternatieve conceptualisatie zou (kunnen) betekenen voor het begrijpen van en omgaan met weerstand in de lerarenopleiding.

De vergelijkende casus analyse laat zien dat de weerstand zelf en het object waartegen weerstand wordt geuit gaandeweg veranderde. De weerstand lijkt gericht te zijn tegen de algehele cultuur van leren en lesgeven in de opleiding, die de twee leraren in opleiding duiden als “schools” en die in scherp contrast staat met de cultuur van leren en lesgeven in hun vooropleiding, die zij als meer “wetenschappelijk” zien. Dit maakt het aannemelijk om weerstand niet als eigenschap van de leraar in opleiding te zien, maar als frictie die ontstaat in interactie tussen culturen van leren en lesgeven. Deze frictie komt voort uit het gevoel tegen grenzen aan te lopen, hetgeen in de literatuur beschreven wordt als *discontinuïteit* (Akkerman & Bakker, 2011).

Daarnaast blijkt dat weerstand op verschillende manieren kan worden geuit, manieren welke we terugvinden in de literatuur als actieve weerstand en disidentificatie (Middleton et al., 2011). Waar *actieve weerstand* te herkennen is aan de expliciet negatieve houding tegen de dominante cultuur, is *disidentificatie* juist af te leiden uit het gebrek aan betrokkenheid in een bepaalde cultuur (van leren en lesgeven). Hoewel actieve weerstand zichtbaarder is en daarmee sterker als negatief kan worden ervaren, duiden onze resultaten erop dat het actief aanwenden van weerstand ook een eerste stap kan zijn om de frictie, die kan ontstaan bij discontinuïteit, om te buigen naar iets wat juist kan bijdragen aan leren. Hierbij speelt ook een rol, dat de opleider de twee leraren in opleiding de mogelijkheid bood om, binnen bepaalde grenzen, zelf vorm te geven aan de didactiek en beoordeling van de opleiding en specifiek aan het ontwerp van het portfolio. Het gegeven dat disidentificatie zich voor de buitenwereld onopgemerkt kan voltrekken, kan dit proces bemoeilijken.

In **hoofdstuk 7** onderzoeken we de intrapersonlijke interacties tussen onderzoek en onderwijs gedurende het eerste jaar van een transitieproces van twee professionals in de lerarenopleiding met een verschillende achtergrond. De transitie betreft die van de hoofdonderzoeker naar opleider en, in omgekeerde richting, die van één van de betrokken opleiders naar onderzoeker. In beide gevallen blijven de professionals in beide praktijken werkzaam (zogenoemde “collaterale transities” Beach, 1999; Beach, 2003). Gezien de verschillen tussen de praktijken van onderzoek en onderwijs is het aannemelijk dat in deze transities discontinuïteit op zou treden. Echter, aangezien het in sommige landen gebruikelijk is dat

lerarenopleiders zowel onderzoek doen als opleiden, zouden we ook continuïteit in deze transitie moeten verwachten. In de literatuur wordt vaak een voorkeur voor continuïteit geuit op affectieve gronden: discontinuïteit levert namelijk vaak spanning en gevoelens van onzekerheid op. Door het analyseren van de 84 wekelijkse logboeken, die de onderzoeker en opleider gedurende het jaar bijhielden, konden we verkennen welke continuïteit en discontinuïteit ze ervaren en hoe ze dit beleven.

In overeenstemming met de literatuur, wordt onderzoek beschreven als “monnikenwerk” en “gepuzzel”, waarbij het van belang is om “een duidelijk focus te hebben” en te “(blijven) schrijven”. Onderwijs wordt aangeduid met de woorden “in actie”, “op het moment”, het belang van “voorbereiding” en het gevoel van “betrokkenheid” met leraren in opleiding en collega’s. Ondanks deze verschillende karakterisering, komt uit de analyses naar voren dat de onderzoeker en de opleider zowel continuïteit als discontinuïteit ervaren, vaak zelfs in dezelfde (beschrijving van de) week. Hoewel continuïteit vaak positief wordt beleefd, in overeenstemming met de literatuur, was dit niet altijd het geval. Discontinuïteit wordt meestal neutraal beleefd, maar ook meerdere malen verwelkomd, in tegenstelling tot wat beschreven wordt in de literatuur. De onderzoeker en opleider rapporteren met name positieve ervaringen over situaties waarin zij zelf een rol hebben gespeeld in het hervinden van continuïteit, bijvoorbeeld door kennis en vaardigheden, opgedaan als opleider, in te zetten bij presentaties op een onderzoeksconferentie.

In **hoofdstuk 8** formuleren we eerst een antwoord op onze onderzoeksvragen, op basis van een synthese van de verschillende hoofdstukken. We concluderen dat de meerwaarde van interacties tussen onderzoek en onderwijs vooral te vinden is in het verkrijgen van inzicht in de *complexiteit* en *onderlinge verbanden*, welke inzichtelijk zijn geworden door het (re)contextualiseren van onderzoek naar betekenisgericht leren en *deliberate practice* in de specifieke opleidingspraktijk. Dit lijkt vooral mogelijk als de volgende vier condities gerealiseerd kunnen worden: attent zijn op discontinuïteit, betrokkenheid tonen, openstaan om te leren en gelijke waardering voor onderzoek en onderwijs.

*Attent zijn op discontinuïteit* impliceert dat er niet wordt uitgegaan van op voorhand vastgestelde verschillen tussen onderzoek en onderwijs, maar alleen van ervaren discontinuïteit, die niet noodzakelijkerwijs overwonnen hoeft te worden, aangezien zij juist ook verrijkend kan zijn. *Betrokkenheid tonen* geeft aan dat allen die met de interacties gemoeid zijn, niet alleen betrokken zijn, maar dit ook tonen in hun handelen, soms juist door tegenstand te bieden. *Openstaan om te leren* behelst dat alle betrokkenen openstaan voor hetgeen er in interactie geleerd kan worden, waaruit volgt dat de benodigde instrumenten nog niet op voorhand vastliggen, maar gezamenlijk worden ontwikkeld. *Gelijke waardering voor onderzoek en onderwijs* betekent dat beide praktijken als even waardevol worden gezien, ook al zijn ze verschillend.

Vervolgens blikken we terug, eerst op onze aannames en vervolgens op de gekozen methodologie. Middels deze bespiegeling stellen we vast dat onze a priori aannames, dat onderzoek en onderwijs verschillende epistemologische praktijken zijn die elkaar kunnen verrijken, ons perspectief beïnvloed kunnen hebben. Dat zou van invloed kunnen zijn geweest op de interacties in het proefschrift waar de hoofdonderzoeker zelf een rol in heeft gespeeld en op de uitgevoerde analyses. Vervolgens

kaderen we de onderzoeksdesigns van de verschillende studies in het proefschrift in met behulp van een model over zogeheten gebruikers betrokkenheid ("user engagement" Rickinson et al., 2011), dat de afnemende controle van de onderzoeker en de vervaging van grenzen tussen onderzoek en onderwijs beschrijft. Ten slotte reflecteren we op de bewuste keuze om de rol van de hoofdonderzoeker op betrokken wijze vorm te geven.

Als laatste blikken we vooruit en presenteren we de implicaties van dit proefschrift voor het research-based opleiden van leraren. We stellen voor om interacties tussen onderzoek en onderwijs, of een gepercipieerd gebrek daaraan, niet langer te beschrijven aan de hand van een kloof. Deze metafoor impliceert een leegte tussen de twee praktijken, terwijl we in het proefschrift juist diverse directe interacties beschrijven. Daarnaast nodigt een kloof uit om gedicht te worden. Aangezien de meerwaarde van de interacties juist gevonden werd in de diversiteit tussen de praktijken, suggereren we in plaats daarvan de metafoor van grenzen, die mogelijk discontinuïteit (kunnen) opleveren, maar ook uitnodigen tot grensoverschrijding, terwijl bestaande praktijken behouden blijven. Ook opperen we om voortaan de expertise van onderwijs gelijk te waarderen aan de expertise van onderzoek. Als laatste spreken we de hoop uit dat onderzoekers in de toekomst de mogelijke negatieve implicaties van interacties tussen onderzoek en onderwijs (bijv. in termen van een gebrek aan controle) niet meer als reden aanvoeren om deze interacties uit de weg te gaan. Dit proefschrift heeft immers de meerwaarde van deze interacties laten zien.



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Zitter, I., Bruijn, E., Simons, P. R. J., & ten Cate, O. (2012). The role of professional objects in technology-enhanced learning environments in higher education. *Interactive Learning Environments*, 20, 119-140. doi:10.1080/10494821003790863

## Curriculum Vitae

Larike Bronkhorst was born on November 28, 1982 in Nairobi (Kenya). Her first “graduation ceremony” took place in Turriabla (Costa Rica) when she completed kindergarten at the Escuela Interamericana. Twelve years later, she graduated from secondary education at the RSG ‘t Pantarijn in Wageningen in 2001. After a gap year devoted to traveling and relearning Spanish, she started studying at University College Maastricht (UCM). During her bachelor degree in social sciences, she spent a semester studying at the University of California Los Angeles (UCLA). She graduated from UCM *summa cum laude* in 2005 with a thesis on problem-based learning and learning styles. After another gap year, spent as a board member at student rowing association MSR V Saurus and as a tutor in problem-based learning courses at UCM, she moved to Utrecht, where she entered the research master Educational Sciences: Learning in Interaction. She graduated *cum laude* in 2008 with a thesis on standards for the self-evaluation of competence assessment programs in vocational education. From 2007 onwards, she dedicated four consecutive summers to teaching international students about Europe and the Netherlands in different courses offered by Utrecht University Summer School.

Larike started her PhD research on research-based teacher education at the Institute for Teacher Education at Utrecht University (IVLOS<sup>11</sup>) in 2008. She presented her research at national (ORD, Velon) and international conferences (EARLI, EAPRIL, ISATT, AERA). In addition, in the spring of 2012 she spent two months at the University of Stanford. In 2010 she sought to enrich her research on interactions between research and teaching in teacher education by working as a teacher educator as well. She taught courses on practice-based research and general learning theories and pedagogies. She also supervised various master and research-master students’ theses and experienced teachers’ research projects. In the spring of 2013, Larike was awarded her university teaching qualification (in Dutch: Basis Kwalificatie Onderwijs). Additionally, she volunteered at IMC Weekend School, a national initiative that provides extra-curricular education for children aged 10 to 14 from underprivileged backgrounds.

During the last year of her dissertation, Larike also worked on a post-doc project funded by the ministry of Education on the effectiveness of different professional development initiatives for teachers aimed at improving the quality of feedback to students (ProFeed). After completing her dissertation, she started collaborating on a review study funded by the Dutch Organisation for Scientific Research (NWO) on connecting in and out-of-school learning. She continues to work on these and other projects at the centre for Educational Development and Training at Utrecht University.

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<sup>11</sup> The Interfacultair Instituut voor Lerarenopleidingen, Onderwijsontwikkeling en Studievoordigheid (IVLOS) became part of the Centre for Teaching and Learning in 2011.



## Publications

### *International publications*

- Bronkhorst, L. H., Meijer, P. C., Koster, B., & Vermunt, J. D. (accepted). Deliberate practice in teacher education. *European Journal of Teacher Education*. doi:10.1080/02619768.2013.825242
- Bronkhorst, L. H., Meijer, P. C., Koster, B., Akkerman, S. F., & Vermunt, J. D. (2013). Consequential research designs in research on teacher education. *Teaching and Teacher Education, 33*, 90-99. doi:10.1016/j.tate.2013.02.007
- Bronkhorst, L. H., van Rijswijk, M. M., Meijer, P. C., Koster, B., & Vermunt, J. D. (2013). University teachers' collateral transitions: Continuity and discontinuity between research and teaching. *Infancia y Aprendizaje, 36*, 293-308
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- Akkerman, S. F., Bronkhorst, L. H., & Zitter, I. (2013). The complexity of educational design research. *Quality & Quantity, 47*(1), 421-439. doi:10.1007/s11135-011-9527-9
- Bronkhorst, L. H., Baartman, L. K. J., & Stokking, K. M. (2012). The explication of quality standards in self-evaluation. *Assessment in Education: Principles, Policy & Practice, 19*, 357-378. doi:10.1080/0969594X.2011.570731
- Bronkhorst, L. H., Meijer, P. C., Koster, B., & Vermunt, J. D. (2011). Fostering meaning oriented learning and deliberate practice in teacher education. *Teaching and Teacher Education, 27*, 1120-1130. doi:10.1016/j.tate.2011.05.008

### *Submitted international publications*

- Bronkhorst, L. H., Meijer, P. C., Koster, B., Woldman, N. N., & Vermunt, J. D. (submitted). Exploring student teachers' resistance to teacher education pedagogies.
- Kleijn, R. A. M. d., Bronkhorst, L. H., Meijer, P. C., Pilot, A., & Brekelmans, M. (submitted). Understanding the up, back, and forward component in master's thesis supervision with adaptivity.

Woldman, N. N., Vermunt, J. D., Bronkhorst, L. H., & Brekelmans, M. (submitted). Factors influencing teachers' learning during educational innovation.

Bronkhorst, L. H., Koster, B., Meijer, P. C., de Kleijn, R. A. M., & Vermunt, J. D. (in preparation). Intended unexpected findings: Insights developed in formative intervention research in teacher education.

#### *National publications*

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