Making mentoring match : mentor teachers' practical knowledge of adaptive mentoring.

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GENERAL CONCLUSIONS, DISCUSSION AND IMPLICATIONS

The purpose of this thesis was to contribute to the knowledge base of mentoring by exploring mentor teachers' practical knowledge of adaptive mentoring. Five studies were conducted. In this final chapter, we discuss the main findings in light of theoretical and practical contributions to the knowledge base of mentoring as a professional practice.

In section 7.1, we first provide a short recapitulation of the overall design and the main findings of the five studies. In section 7.2, we discuss the methodological strengths and limitations of the study. In section 7.3, we return to the main aim of the thesis; contributing to the knowledge base of teacher mentoring, by making practical knowledge explicit. In sections 7.4 and 7.5 we take up the issues of representation and verification of mentor teachers' practical knowledge. In these sections, we discuss possible avenues for future research. Finally, in section 7.6 we take up the issue of improvement of mentor teachers' practical knowledge, with suggestions for professional preparation of mentor teachers.

7.1 Four components, five studies

In the general introduction, four components were introduced that guide the overall research design of the study. These are all assumed to play a role in mentor teachers' capacity to adaptively respond to their mentee teachers' learning: (1) a disposition of collaboration and inquiry, (2) practical knowledge of mentoring activities, (3) practical knowledge of novice teachers and their learning, and (4) heuristics for adaptive mentoring. These heuristics connect (2) and (3) as

actionable knowledge. Each of the five studies in this thesis focused on one of these four components. Study 1 focused on mentor teachers' *disposition of collaboration and inquiry*, through a large-scale survey with questionnaire. This study also provided the criterion for the purposive sampling of participants for the subsequent interview studies. The goal was to maximize variation by selecting mentors with different patterns of mentoring conceptions. It was assumed this would maximize the chances of finding a variety of mentoring activities and attributes of mentee teacher learning. Study 2 focused on mentor teachers' *practical knowledge of mentoring activities* through task-based interviews. The final three studies used repertory-grid interviews to explore shared elements in mentor teachers' practical knowledge. Study 3 focused on *practical knowledge of mentee teachers' learning* and study 4 focused on *practical knowledge of mentoring activities*. Study 5 combined the analyses of study 3 and 4 to focus on mentor teachers' shared *heuristics for adaptive response* to their mentee teachers' learning. Table 7.1 presents the main findings of the five studies.

Table 7.1. Overview of main findings in the five studies in this thesis.

Study	Component	Main findings
1 (Ch2)	Disposition of collaboration and inquiry	• Two personal mentoring motives: personal learning motive and generative outcome motive • Two mentoring conceptions: instrumental mentoring conception and developmental mentoring conception. • Mentors show equal agreement with personal learning motive and generative outcome motive. • Mentors prefer a developmental mentoring conception to an instrumental mentoring conception. • Strong relationship between personal learning motive and developmental mentoring conception: being a co-learner and a co-thinker is related in mentor teachers' views.
2 (Ch3)	Practical knowledge of mentoring activities	• 29 mentoring activities oriented towards four broad mentoring goals. • Four adaptive mentoring activities: attuning emotions, adapting conversations, aligning expectations and building tasks from simple to complex • Adaptive mentors focus more on support for constructing practical knowledge, and less on creating a favourable context for mentee learning. • Adaptive mentors were cognitively or emotionally adaptive.

Table 7.1. (continued).

Study	Component	Main findings
3 (Ch4)	Practical knowledge of mentee teachers' learning	• 33 bipolar constructs related to four broad domains of mentee teacher functioning. • Dominant constructs reflected differences in mentee personal engagement with pupils, identifying as a teacher, perfectionism and self-confidence. • Dominant constructs combine according to dimensions of social judgement: social desirability and social utility. • Mentors use predominantly dispositional explanations for dominant constructs.
4 (Ch5)	Practical knowledge of mentoring activities	• 34 mentoring activities oriented towards four broad mentoring goals. • Confronting mentees with problems is the dominant mentoring activity, most often combined with guiding application. • Mentors describe confronting as telling versus developing the problem, depending on the issue that mentors try to address by confronting mentees. • In developing the problem, mentors describe crafting the response through 1) taking the mentee perspective, 2) timing confrontation, 3) monitoring mentee reactions and 4) self-monitoring.
5 (Ch6)	Heuristics for adaptive response	• Common heuristics for 17 different mentoring situations, related to two domains of mentee teaching and two domains of mentee learning to teach. • Heuristics for the domains of mentee learning to teach are oriented toward a wider range of mentoring goals than heuristics for the domains of mentee teaching.

The central question of this thesis was: *What is the content of mentor teachers' practical knowledge of adaptive response to their mentee teachers' learning?* The answer to this question is provided with the various representations of the content of mentor teachers' practical knowledge in the studies, at different levels of reduction. First, the interview fragments presented in Chapters 4 and 5 provide representations of this practical knowledge closest to mentor teachers' narration of the lived practice of mentoring. Second, more condensed representations of the content of mentor teachers' practical knowledge are provided in the form of the 'if…then' heuristics in Chapter 6, and the themes in Chapters 4 and 5 that show how mentors view their mentee teachers' learning and how they describe the enactment of confronting. Finally, the most reduced representations are provided in the form of the structured lists of mentoring activities and attributes of mentee teachers' learning in Chapters 3, 4 and 5, organized according to mentoring goals and domains of functioning of mentee teachers.

Figure 7.1 presents a provisional component model to represent the content of mentor teachers' practical knowledge of adaptive response to their mentee teachers' learning, based on the findings in this thesis. It outlines the four components introduced in Chapter 1 and the general categories of mentor teachers' practical knowledge related to adaptive mentoring identified in the five studies. The nested organization of the model draws in part on the general structure of teachers' lines of thinking when they account for their practice, moving from actions, intentions and interpretations of situations towards standing beliefs (Kennedy, 2004). The model intends to convey how the four components relate to each other. Mentor teachers' heuristics for adaptive response constitute conditional knowledge, in which mentors combine practical knowledge of mentoring activities and of mentee teachers' learning. In turn, these are assumed to be embedded in mentor teachers' dispositions toward mentoring. The model takes into account that a disposition of collaboration and inquiry is assumed to be conducive to adaptive mentoring, and that mentoring conceptions and motives for being a mentor form part of this disposition.

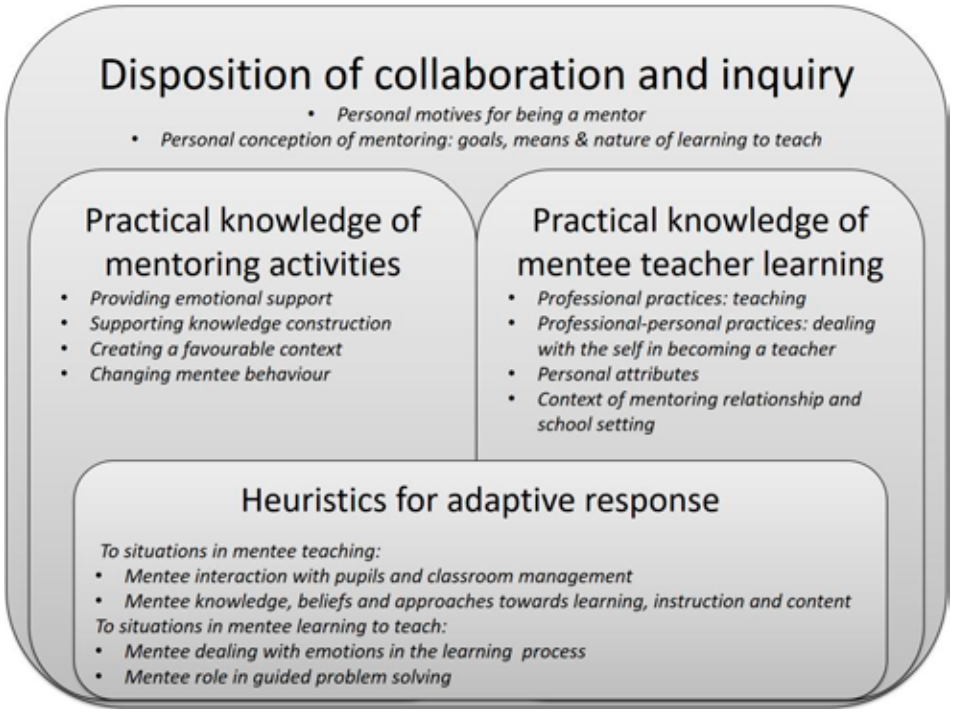

Figure 7.1. Component model of mentor teachers' practical knowledge for adaptive response to their mentee teachers' learning, based on the findings in this study[7].

[7] Note that for brevity, not all seventeen heuristics identified in study 5 are mentioned in the model, only the domains of mentee learning they relate to.

7.2 Strengths and limitations

7.2.1 Strengths

7.2.1.1 Study design

The study used a purposive sampling based on the results of the first study. The assumption that this would generate a large variety in the small scale studies was born out in the results: study 2 identified 29 mentoring activities, study 3 identified 33 constructs, and study 4 identified 34 mentoring activities. For the identification of mentoring activities, two different instruments were used: a task-based interview in study 2 and a repertory grid interview in study 4. The interview protocol for the task-based interviews addressed 'here-and-now' as well as 'there-and-then' aspects of mentors' professional practices. The repertory grid interviews sampled a large span of mentor teachers' experience, focussing on well-remembered mentees that are likely to have influenced the development of their personal heuristics for adaptive response (Corno, 2008). The two instruments provided complementary data on mentoring activities and adaptive mentoring activities (see section 7.4.1): both at the level of addressing specific issues of mentee learning and at the level of shaping the overall mentoring process. In total, approximately 46 distinct mentoring activities were identified across the two studies (see section 7.4.1).

7.2.1.2 Qualitative data and analysis

The transcripts of the task-based interviews and the repertory-grid interviews showed many mentors engaging in significant storytelling about their practices, shifting into performed direct speech (directly performing speech as a mentor, novice or pupil), and co-constructing the narrative with the interviewer. The narrative quality of much of the interview data suggests that within the limitations of a single interview, significant information on mentors' views of their mentoring knowledge and experience is likely to have surfaced. The coding of mentoring activities and attributes of mentee learning in this research was performed close to the data, using guiding concepts from the research domain,

but with little a-priori imposition of a theoretical framework. Coding was systematically calibrated between two coders leading to good levels of inter coder reliability. The illustrations of themes in Chapters 4 and 5 with examples from the interviews enable the reader to judge if they would make the same inferences based on the data. The use of a second-order perspective in study 4 provides a degree of theoretical verification of the results.

7.2.2 Limitations

7.2.2.1 Generalisability

Apart from study 1, the studies were small in scale, with 18 mentors included in the task-based interviews and 11 mentors in the repertory-grid interviews. In all three qualitative studies in Chapters 3, 4 and 5, several constructs or mentoring activities were encountered only once, and sometimes it took one very explicit articulation to recognize similar instances in other parts of the data. Even in the larger-scale first study, the pilot study to identify mentoring motives indicated that a possible third, school-organization oriented motivation may be present, but there were too few items to construct a reliable scale from. Combined with the finding that mentoring practices tend to be highly idiosyncratic (Hawkey, 1997), there is enough reason to believe that a larger sample may have generated a larger diversity of motives, attributes of mentee learning, mentoring activities and mentoring heuristics.

7.2.2.2 Validity

Mentor teachers' practical knowledge, even if limited to the domain of adaptive response, is a broad construct and several facets have not been captured in this study. A limitation of the interview protocols used in this study was that these did not probe mentors to justify their actions (Fenstermacher, & Richardson, 1993; Gholami & Husu, 2010; Kennedy, 2004). Such questions can elicit practical principles and underlying beliefs of mentors about why they consider their response effective or just (Kennedy, 2004, Morine-Dershimer, 1987). Such principles and beliefs also form part of mentor teachers' practical knowledge (Elbaz, 1981). Incorporation of such questions could have provided a fuller

account of mentor teachers' practical knowledge, but would also have made the interviews sessions longer. In study 4, the analysis of the repertory-grid interviews showed that mentors tended to use dispositional explanations in their descriptions. This may in part be an artefact of the method used, as comparing mentee teachers may operate at a higher level of abstractness and promote inferring of traits (Moskowitz & Okten, 2016). All interviews were conducted retrospectively at one point in time, and only the task-based interviews were conducted close to a mentoring event. Mentor teachers' interactive cognitions have therefore not been queried, for instance through stimulated recall techniques. Such cognitions may uncover heuristics for momentary adaptations, and show how additional considerations other than characteristics of learners influence mentors' response (Kennedy, 2004). In addition, this could have provided evidence of practical knowledge as it is enacted in real-time mentoring events (Kane, Sandretto, & Heath, 2002).

7.3 Contributing to the knowledge base of mentoring

The aim of this thesis has been to contribute to the knowledge base of mentoring by exploring mentor teachers' understanding and practical knowledge of adaptive mentoring. This has been attempted in this thesis through representations and descriptive accounts of mentor teachers' practical knowledge, and through the use of theoretical perspectives to elucidate specific characteristics of this knowledge. Verloop, Van Driel and Meijer (2001) argued that for practitioner knowledge to contribute to the professional knowledge base, it is desirable to focus on common elements in teacher knowledge, or elements that are shared by teachers, even though it remains a continuing empirical question regarding which elements are shared. The focus in the final three studies has therefore been on common elements in mentor teachers' views of their mentees, their mentoring activities and their heuristics for adaptive response and creating learning opportunities. In the individual chapters of this thesis, the argument of Hiebert, Gallimore and Stigler (2002) has repeatedly been put forward that in order for practitioner knowledge to become professional knowledge, it "must be public, it must be represented in a form that enables it to be accumulated and shared with other members of the profession, and it must be continually verified and improved " (p.

4). In the following three sections, we therefore discuss our findings in view of these three issues of representation, verification and improvement of mentor teachers' practical knowledge.

7.4 Representations of mentor teachers' practical knowledge

As indicated in section 7.1, the content of mentor teachers' knowledge has been made public and sharable in this thesis through different kinds of representations: scales of mentoring conceptions (Chapter 2), structured lists of mentoring activities (Chapters 3 and 5) and attributes of mentee teacher learning (Chapter 4), mentors' narration of the lived experience of mentoring (Chapters 4 and 5), themes in mentor teachers' descriptions (Chapters 4 and 5) and heuristics for seventeen mentoring situations in the form of condensed 'if...then' statements (Chapter 6). These heuristics capture mentor teachers' shared actionable knowledge of adaptive response, linking both mentoring situation and response within the heuristics. The organization of these heuristics around attributes of novice teachers' learning was chosen to reflect how mentor teachers' practical knowledge of adaptive response is predominantly practice-oriented knowledge, (Aspfors & Fransson, 2015), functioning primarily for mentors "to guide their actions when they encounter the critical question, 'what should I do in this particular situation?'" (Gholami & Husu, 2010, p. 1520), and is therefore organized "according to the problem the knowledge is intended to address" (Hiebert et al., 2002, p. 6). It represents mentor teachers' practical knowledge as actionable, practical principles (Elbaz, 1981) or forms of practical reasoning (Gholami & Husu, 2010) that guide mentor teacher action. In reducing mentor teachers' descriptions to the structured lists of mentoring activities in chapters 3 and 5, the relationship that mentors describe between these activities and the goals they attempt to realize with these activities was therefore also maintained, again reflecting the practical and goal-oriented nature of this mentor knowledge.

In at least one sense, however, the representation of the heuristics in chapter 6 presents forms of professional judgement or practical reasoning that are incomplete. Complete forms of practical reasoning not only connect actions and intentions to situational interpretations or contextual grounds, but also connect

these to accumulated principles, values and beliefs that contain warrants for why these actions may be just or effective in this situation (Fenstermacher, & Richardson, 1993; Gholami & Husu; 2010, Kennedy, 2004). In this second sense, the heuristics described in this study do not represent complete forms of practical reasoning since they contain no shared warrants for their justness or effectiveness. Future studies could incorporate questions to probe justifications and to develop descriptions of mentor teachers' practical reasoning in a more complete form, including warrants for what is effective or just to do in a situation.

7.4.1 Grain size in representing practical knowledge of adaptive mentoring

In relation to defining the knowledge base for teaching in teacher education, Kennedy (2016) and Forzani (2014) state that representing knowledge of practice is inherently problematic. Any representation necessarily partitions the knowledge of practice in order to articulate its constituent parts. The inherent problem in identifying these constituent parts is the grain size of parts (Forzani, 2014; Kennedy, 2016). Representing the knowledge of practice in terms of what practitioners do or know runs the risk of creating ever-expanding lists of activities or knowledge domains at highly different grain sizes.

Chapters 3 and 5 provided representations of mentor teachers' practical knowledge of mentoring activities, but at different grain sizes. In both chapters, mentoring activities were listed and organised according to four broad mentoring goals that mentors oriented themselves to in describing these activities. Although both representations used these same four broad mentoring goals, the mentoring activities contained in these lists differed to a degree between the two studies. Table 7.2 presents all mentoring activities according to the degree of overlap between the two studies. This shows that there is only partial overlap in mentoring activities between the two studies. Seven mentoring activities are similar across both studies, and 32 are unique to one of the two studies. For 16 mentoring activities, different verbs were used in the two studies, but the content of the activities exhibits overlap. For instance, the mentoring activities of initiating and soliciting share the aspects of initiating topics, reflective questioning and stimulating mentee ownership of solutions. Some of these mentoring activities were identified separately in one study, but combined in a single activity in the

other study. For instance, the mentoring activities of confronting mentees with problems and dictating mentee behaviour are identified separately in study 4, but are combined in the mentoring activity of imposing in study 2. The differences in verbs are the result from trying to stay as close to the data as possible in developing the coding schemes in the two studies, without imposing a predetermined structure, theoretical or otherwise, on mentor teachers' descriptions.

The comparison between the mentoring activities in the two studies shows that they mostly operate at different grain sizes. Mentoring activities that were only identified in study 3 operate mostly at the level of shaping the overall mentoring process (i.e. aligning mutual expectations at the start, linking across mentoring conversations, facilitating access to learning experiences). Mentoring activities that were only identified in study 5 operate mostly at the level of addressing specific issues of mentee learning (i.e. helping mentees to cope with personal limitations, using mentee qualities, stopping specific mentee behaviours). Mentoring activities identified in both studies mostly constitute activities that can be enacted both as 'standard' mentoring practice and to resolve specific issues in mentee learning (i.e. attuning to the emotional state of the mentee, being there, making mentees responsible for tasks, questioning to elicit reflection and problem solving).

Table 7.2. Mentoring activities according to their degree of overlap between study 2 and study 4.

	Mentoring activities			
Degree of overlap	Providing emotional and psycho-social support	Supporting construction of personal practical knowledge about teaching	Creating a favourable context for mentee teacher learning.	Changing mentee teacher behaviour.
Same term, similar in content	Affirm Attune * Be there Reassure		Give status Make responsible	Model Monitor
Different term, some overlap in content	(2) Address ~ (4) Focus motives (2) Indicate growth ~ (4) Solicit self-affirmation	(2) Initiate ~ (4) Solicit	(2) Intervene + (2) Protect ~ (4) Shield	(2) Advise ~ (4) Suggest (2) Impose ~ (4) Confront + (4) Dictate (2) Orchestrate challenge ~ (4) Orchestrate crisis
No overlap, only in study 2	Buffer feedback Orchestrate success Share	Access thinking Adapt * Build * Encourage Link Structure	Align * Bound Facilitate Induct	
No overlap, only in study 4	Focus person Focus emotions Help cope Incite	Explore self-questioning Focus teaching Focus discipline Focus instruction Focus instruction Focus pupil contact Guide application Use	Abbreviate Decrease Defer Increase Prolong Self-adjust	Curb behaviour

Note: * indicates mentoring activities identified as adaptive activities in study 2. Numbers in parentheses refer to study 2 and study 4.

The two studies therefore complement each other by providing insight into adaptive mentoring activities at different grain sizes and into generic mentoring activities for shaping the overall mentoring process. The differences between the two sets of mentoring activities can largely be explained in terms of the focus of the interviews and the resulting content of the mentoring activities. The task-based interviews used in Chapter 3 focused mostly on how mentor teachers' normally shaped the mentoring process. This elicits more mentoring activities which are pro-actively undertaken by mentors and operate at the larger grain size of the overall mentoring process. It likely leads to underreporting of activities undertaken for specific adaptive purposes. In the repertory-grid study in Chapter 5 however, the card sorting method forced mentors to explicate activities linked to specific attributes of mentee teacher learning. This likely leads to underreporting of activities at larger grain sizes of shaping the overall mentoring process.

To conclude, we note that grain size poses a challenge for the development of more comprehensive knowledge frameworks for adaptive mentoring practices. We propose that grain size be carefully considered in future studies that intend to develop knowledge of adaptive mentoring. Future studies can use our findings to consider the grain size at which they intend to capture and elicit knowledge of attributes of mentee learning, mentoring activities and heuristics, to choose appropriate instruments for that grain size.

7.5 Verification of mentor teachers' practical knowledge

With regard to verification, Verloop et al., (2001) warned against simple application of theory and the mere redefinition of practice in formal-theoretical terms. They argued that a comprehensive conception of a professional knowledge base that includes practitioner knowledge:

> implies a need to look differently at the relationship between theory and practice. Combining, integrating, and exchanging the two components become more important. Before this relationship can be studied adequately, there must be a balanced view of both theory and

> practice (i.e., teacher knowledge). As insight into teacher knowledge is still lacking, the first step needs to be an investigation of this component of the knowledge base of teaching. (p. 445).

In this thesis, the function of theoretical terms has been mostly to help describe mentor teachers' practical knowledge that was explicated in the interviews, or to relate findings in a post-hoc manner to more formal-theoretical concepts and models. In terms of staying close to the practical knowledge of mentors and its' meaningful integration as practical knowledge, the interview fragments in Chapters 4 and 5, and the heuristics for seventeen mentoring situations in Chapter 6 arguably come closest. In this section, we discuss five strands of theory building that may be further developed from or linked to the findings in this thesis.

7.5.1 Theorizing levels of change in becoming adaptive as a mentor

In Chapter 3, we concluded that the four adaptive mentoring activities identified in the task-based interviews reflect three current notions in research work on novice teacher mentoring of what it means to be adaptive: matching mutual expectations (Rajuan, Beijaard & Verloop, 2010), being versatile through shifting style (Crasborn, Hennissen, Brouwer, Korthagen, & Bergen, 2008) and helping novices to reframe teaching (Bradbury, 2010). Taking this a step further, these three notions of being adaptive may require different levels of change of mentor teachers in becoming more adaptive. It may be a fairly simple change in mentor behaviour to start incorporating discussion of mutual expectations at the beginning of the mentoring relationship and to revisit these expectations in the course of the mentoring process. This change may in first instance mainly require an increased readiness to accept the risk of criticism of personal mentoring practices. Shifting style may however require a more elaborate knowledge of a repertoire of mentoring activities, and require more diagnostic thinking by the mentor to judge when to shift style. Finally, deciding to start helping novices to reframe teaching may require completely revisiting one's conception of the goals of mentored learning to teach, to one that is more in line with a developmental mentoring conception. This may also involve more substantial changes in

mentoring practice. For instance, the more adaptive mentors in Chapter 3 described more activities connected to stimulating novice teachers to adopt a meaning-oriented learning orientation, similar to what expert teacher educators in Bronkhorst, Meijer, Koster, and Vermunt (2011) define as “learning to teach by developing an informed, personal theory of practice” (p.1127). They were more likely to mention activities oriented at supporting construction of personal practical knowledge, such as encouraging novice teachers to think through problems they bring in, and structuring mentoring conversations to complete a process of reflection. This may require mentors to function at more complex levels of development. Such more complex levels have been shown to correlate with "a greater ability to “read and flex” with [learners], to take the emotional perspective (empathy) of others, think on their feet and find alternative solutions (less “functional fixedness”)" (Sprinthall, Reiman, & Thies-Sprinthall, 1993, p. 285). Bringing these three forms of being adaptive together in this way may help to connect them within a broader notion of levels of change or development (Korthagen & Vasalos, 2005; Sprinthall et al., 1993).

7.5.2 Adaptive mentoring involves social judgement

For the description of mentor teachers' views of mentees in Chapter 4, the distinction between dimensions of social judgement constitutes a redefinition in more formal-theoretical terms. If social judgements are pervasive in everyday life as indicated by social judgement theory, they are likely to be part of practical knowledge, which encompasses all of mentor teachers' cognitions.

A main finding in Chapter 4 was that mentor teachers’ views of their mentees predominantly reflected separate judgements of social desirability and social utility, each combining a few attributes of mentee teacher teaching and learning to teach. This suggests that mentor teachers' views of their mentee teachers may be parsimoniously captured using a framework of two dimensions (i.e. social utility and social desirability) by two domains (i.e. mentee teaching and mentee learning to teach). This would consist of: 1) a social desirability component regarding mentee teachers' a) professional identification and b) contact with pupils, and 2) a social utility component regarding mentee teachers' a) self-confidence, b) independence in problem-solving, c) assertive presence in class, d) seriousness and e) planning for teaching. Such a framework could be

used to develop an instrument to chart mentor teachers' views of mentee teachers across contexts or across time. Research using such a framework could focus on the different phases of the mentoring relationship where mentor teachers' views of their mentee teachers may have different impacts: the initiation phase, the productive or cultivation phase, and the termination phase (Chao, 1997). Mutual impression formation by the mentor and mentee of each other at the initiation phase of the mentor relationship has been shown to be an important determinant of the match in the mentoring relationship (Kroeze, 2014). In the productive phase, these views will influence how mentor teachers diagnose individual mentee teachers' learning, as a basis for responding to their mentees. In the termination phase, mentors in teacher education and induction often have a role in summative judgement, with potentially high stakes for the mentee involved. Using the two by two framework may provide the tools to study the degree to which mentors carry over their views of their mentee teachers from phase to phase, or change these views as a result of the mentoring process. This may provide indications of mentor teachers' capacity to match the learning needs of their mentees. Mentors that are capable of adaptively responding to their mentee teachers' learning, should be able to achieve change in their mentee teachers' functioning and subsequently arrive at different judgements of it. This may help further uncover areas of mentee teacher learning that mentor teachers find hard to support.

7.5.3 Adaptive mentoring as scaffolding

Although the four broad mentoring goals provided a sufficient framework for organising mentor teachers' descriptions of mentoring activities in this thesis, other frameworks are also possible. Though not reported in this thesis, we also explored the possibility of analysing mentoring activities according to the framework of scaffolding intentions developed by Van de Pol, Volman and Beishuizen (2010). We discuss this application here because it suggests potential benefits for both mentoring research and scaffolding research. Similar concepts to scaffolding such as assisted performance have been used to analyse adaptive mentoring (Stanulis, Brondyk, Little, & Wibbens, 2014), but scaffolding has so far focused mostly on contexts of tutoring and classroom situations (Van de Pol et al., 2010).

The concept of scaffolding refers to the temporary support provided for a learner, to achieve a result that is beyond the unassisted effort of the learner. Van de Pol et al. (2010) synthesized five scaffolding intentions from their review of the literature. These scaffolding intentions differ according to their orientation, and can be oriented at learners' meta-cognitive activities, cognitive activities, or affect. In our exploration, we used these scaffolding intentions and domains of support for the second-order analysis of mentoring activities. Table 7.3 presents the scaffolding intentions that were tentatively formulated as a result of this exploration. All but two of the mentoring activities identified in the analysis of the repertory-grid interviews could be classified according to these scaffolding intentions. This classification was used to explore the patterns of scaffolding intentions involved in the heuristics in study 5 (Chapter 6). The exploration suggested a similar pattern as found in this study: for attributes of mentee teachers' learning to teach, mentors mentioned a broader set of scaffolding intentions than for attributes of mentee teachers' teaching. This tentatively suggests that a more formal-theoretical verification of the activity patterns found in Chapter 6 may be possible.

We suggest that future studies explore the possibility of applying the framework of scaffolding intentions to studies of teacher mentoring. The mentoring activities formulated in this thesis, and the tentatively formulated scaffolding intentions in Table 7.3 could provide a good starting point. Such studies could combine data on mentor teachers' thinking and behaviour to identify both mentoring activities and the intentions they are oriented toward. Mentors could for instance be asked to keep a log of mentoring activities and goals, in addition to methods to capture mentoring interactions such as audio or video recording. The development of such a more comprehensive description of scaffolding intentions in teacher mentoring could help to broaden the scope of scaffolding research and provide a more solid theoretical grounding and verification for notions of adaptive mentoring.

Table 7.3. A tentative set of scaffolding intentions involved in mentoring activities.

Domain of support	Scaffolding intention	Content of the scaffolding intention
Support of meta-cognitive activities	Goal setting *	Developing learning goals with or for the learner to pursue.
	Direction maintenance	Keeping learning on target and maintaining the learner's pursuit of a particular objective.
Support of cognitive activities	Cognitive structuring	Providing explanatory and belief structures that organize and justify.
	Reduction of degrees of freedom	Taking over those parts of a task that the learner is not yet able to perform and thereby simplifying the task for the learner.
	Expansion of degrees of freedom *	Increasing task complexity for learners by handing over parts of the task to learner independence.
Support of learner affect	Recruitment	Getting learners interested in a task and helping them adhere to the requirements of the task.
	Frustration control	Facilitating learner performance and keeping learners motivated via the prevention or minimization of frustration.

Note: * = Formulated from the explorations for this thesis, absent in Van de Pol et al. (2010).

7.5.4 Adaptive mentoring involves mentor self-regulation

Early studies of teacher practical knowledge identified knowledge of self as an important component of this knowledge (Elbaz, 1981). In several of our findings, mentor teachers' practical knowledge of adaptive response related to themselves, mostly to processes of mentor self-regulation. In Chapter 5 we found that when mentors describe 'developing the problem' they also tend to describe their awareness of how their own thoughts and feelings influence their response to their

mentee, and how they self-monitor as part of crafting their response in order to ensure that their response remains adaptive to the mentee teacher. In Chapter 6, mentors mentioned self-adjusting as an adaptive response for when mentees are overconfident and self-centred and therefore not open to feedback. This self-adjusting functioned to prevent the emotions or self-appraisals that the mentoring situation evokes for the mentor from impeding the initiation or productive functioning of the mentoring relationship. These forms of active self-monitoring and self-adjusting suggests that mentors know that the match in mentoring relationships may derive in part from active and deliberated self-work on the part of the mentor teacher, which may be seen as a form of self-regulation by the mentor.

Recent research has shown that engaging in the role of mentor may engender significant emotions for mentors (Hastings, 2004). Mentor teachers' self-regulation may therefore also involve significant regulation of emotions. Schunk and Mullen (2013) suggested that mentoring research should conceptually integrate with research on self-regulation in learning. They proposed a process model of mentoring interactions that attends to the self-regulatory cognitions and affects of both the mentor and the mentee, and how these shape the subsequent actions of each. They argued for longitudinal studies in mentoring that monitor the dynamic nature of self-regulation of both mentor and mentee. We suggest that such micro-level studies may help uncover how different mentoring situations affect mentors. For example, some situations may require more intense self-regulation by the mentor, to maintain a working relationship with their mentee, and the question may be how different mentors manage to self-regulate in such situations. This may help to inform ways that mentors may support novices in how they regulate their learning and to change as a learner (Oosterheert, 2001).

7.5.5 Adaptive mentoring towards novice teacher change as a learner

Oosterheert (2001) provided indications for how novice teachers with different learning orientations may be supported to change as a learner. These complex learning orientations represent attributes of novice teacher learning that operate at a much larger grain size than those described in our thesis. Orientations to

learning to teach involve combinations of novice teachers' mental models of learning to teach, their cognitive activities and their emotion regulation (Oosterheert, 2001). The heuristics described in Chapter 6 for the two domains of learning to teach come closest to mentors identifying the latter two components of mentee teachers' learning orientations: making use of mentor support in problem solving and dealing with emotions in learning. The themes in mentor teachers' views of their mentees in Chapter 4 may also reflect these components: independent problem solving comes from inner strength, and perfectionism hampers reflection.

An example from the interviews that may most clearly reflect this larger grain size of a learning orientation and mentor support to change as a learner, is the example of Kay and Deke in Chapter 5 (see section 5.3.2.2). In the account of the mentor Kay, mentee Deke had no idea how to learn to teach and had very little strategies for regulating the cognitive and emotional elements of the learning process. The example showed the difficulties that mentor Kay had experienced in trying to change Deke's learning orientation, without success. This may be considered an instance of a mentor trying to help a novice with an inactive/survival orientation to change as a learner (Endedijk, 2010; Oosterheert, 2001). Retrospectively, Kay could provide an overview of Deke's pattern of learning and his inability to make productive use of Kay's support. It remains an open question however, whether mentors can diagnose larger patterns of mentee learning in the process of mentoring, and adapt to these patterns on the fly. Our findings suggest they may identify specific components, mostly how mentees regulate their learning cognitively and emotionally.

Oosterheert (2001) proposed that ideally, novice teachers are stimulated to change as a learner, and move from inactive and more closed and reproductive learning orientations toward more open and meaning oriented learning orientations. However, novice teachers' orientations to learning to teach tend to also differentially predispose them to make proactive broad use of their mentor teachers (Endedijk, 2010; Oosterheert, Vermunt, & Denessen, 2002). For mentors, this may pose a triple challenge: helping the novice learn to teach, helping the novice change as a learner, and working around potential resistance to accept mentor support. Future research could study how the attributes that mentors tend to notice in novice teachers' learning relate to the learning orientations that novice teachers themselves report, and how mentor teachers

could be supported to notice such attributes earlier on in order to provide support that may help novices change as a learner. Somehow, this would require mentors to combine attributes of mentee teachers' learning they notice into heuristic profiles of mentees as learners at the level of their overall pattern of learning. Novice teachers' learning orientations tend to shift during professional preparation (Endedijk, 2010), but the exact contribution of the learning context and the mentor in this context is still unclear. Future studies could therefore explore how novices with specific learning orientations make use of mentor support and how and whether mentors can respond adaptively to help them change as a learner.

7.6 Improvement of mentor teachers' practical knowledge

With regard to improvement of practical knowledge, Verloop et al. (2001) argued that the main function of a professional knowledge base "is not prescription, but improving the "practical arguments" in the thinking process of the teacher" (p. 443). Here, we first discuss how mentor teachers' practical knowledge may affect their participation in current attempts to improve teacher preparation. Subsequently, we discuss how findings may translate more directly into efforts at developing mentor teachers' practical knowledge of adaptive mentoring.

7.6.1 Alignment with current developments in teacher preparation

Recent views of how teacher education and induction may be improved include suggestions toward a curriculum organized around core teaching practices and deliberate practice (Kennedy, 2016) and teacher collaborative research. These forms of preparation may provide more adaptive support for novice teacher learning in various ways. These suggestions may or may not align with mentor teachers' practical knowledge. Findings in this thesis point both ways.

7.6.1.1 Misalignment with mentor teachers' practical knowledge

A main finding in Chapter 4 was that mentor teachers' views of their mentees involve frequent use of a dispositional explanatory style. Parker-Katz and Bay (2008) found a similar dominance of mentor dispositional reasoning in their study of mentor knowledge, noting that "mentors listed mostly dispositional qualities in response to our question about the knowledge novices needed" (Parker-Katz & Bay, 2008, p. 1263). They concluded that mentor teachers' are less focused on what novices need to know and more on who they can become as teachers.

In our study, mentors use of a dispositional style of reasoning was most pronounced with regard to mentee lesson planning. This raises questions with regard to redefinitions of teacher education that focus on learning through deliberate practice, targeting high leverage core teaching practices (Grossman, Hammerness, & McDonald, 2009), and the involvement of mentor teachers in supporting certain core practices, especially planning for teaching. In the exploratory study of deliberate practice in teaching by Dunn and Shriner (1999), the six activities that best reflected deliberate practice included both mental and written planning of teaching. Stanulis et al. (2018) also identify co-planning as an important mentoring practice. Mentors that successfully engage novices in deliberate practice have been found to have a targeted practice for novices and assume a stance as teacher leader, holding novices accountable for trying out ideas (Stanulis et al., 2014).

When mentors attribute mentee teachers' level of planning to disposition rather than effort, they may not be predisposed to hold novices accountable for planning, and may not engage them in deliberate practice for lesson planning. Further research seems warranted on how mentor teachers' view the adoption of specific core teaching practices, and specifically on the explanatory styles they may use for mentee teachers that show resistance to such practices.

7.6.1.2 Alignment with mentor teachers' practical knowledge

The findings in Chapter 5 suggest alignment between mentor teachers' practical knowledge and forms of teacher preparation that involve more deliberate practice. In Chapter 5, we concluded that the dominant mentoring activity of confronting constitutes a form of goal setting. Mentors combined the dominant

combination of confronting and guiding application with a wide range of additional mentoring activities across four broad mentoring goals, amongst which they often mentioned focussing time on specific aspects of teaching. This indicates a conscious effort by mentors to engage their mentee teachers in forms of intentional learning and deliberate practice, related to goals that represent both work-based goals and self-improvement goals for the novice teachers (Dunn & Shriner, 1999; Bronkhorst et al., 2011). Such a process differs from mere workplace learning support, as workplace learning tends to be mostly incidental and non-deliberative, without "a definite learning goal and time (...) set aside for acquiring new knowledge" (Eraut, 2004, p. 50). Such an intentional approach to mentee learning may link up well with current proposals for improvement of teacher education that include more focus on deliberate practice of core teaching practices (Grossman et al., 2009). This may predispose mentors to engage with efforts to realize these forms of teacher preparation.

As noted at the start of this thesis, a culture of collaboration and inquiry is considered beneficial for novice teacher learning. The main findings in Chapter 2 were that mentors prefer a developmental mentoring conception to an instrumental mentoring conception, and the strong relationship between holding a developmental mentoring conception and a personal learning motive. Mentors holding these conceptions and motives may be more disposed to engage in collaborative forms of professional development such as mentor study groups that focus on developing specific core mentoring practices (Stanulis et al., 2018). They may also be more disposed to engage positively with current developments toward more collaborative forms of professional support for novice teachers in which mentors are not the sole or primary support providers, such as teacher collaborative research (Willegems, Conseugra, Struyven, & Engels, 2017). These forms of professional support may also be more adaptive to novice teacher learning through providing a richer culture of support than when novices need to rely mostly on one mentor (Kroeze, 2014). Key elements in teacher collaborative research include shared inquiry into pupil learning, less hierarchical relationships and mutual learning between multiple participants at different levels of expertise. These elements are highly congruent with beliefs that form part of the developmental mentoring conceptions that Dutch mentors in our study hold, and with holding a personal learning motive for being a mentor.

We note that creating these more collaborative and deliberative forms of professional development for novice teachers requires a shared view of a continuum of tasks for professional development (Feiman-Nemser, 2001a), and structures for engaging multiple actors within the partnership in more concerted ways around this continuum (Birkeland & Feiman-Nemser, 2012). Hence, making good use of these openings may require a restructuring and rethinking of many current practices in partnerships between teacher education institutes and schools.

7.6.2 Practical suggestions for professional preparation of mentor teachers

We know that mentor teachers are often underprepared for their role, and that preparation can have beneficial effects on their mentoring practice (Hoffman, Wetzel, Maloch, Greeter, Taylor, DeJulio, & Vlach, 2015). We suggest that the various representations of mentor teachers' practical knowledge in this thesis (outlined in section 7.3.1) provide ample source for the development of materials and activities for professional development. We discuss four suggestions.

7.6.2.1 Reconsidering goals for mentor training

Based on the component model presented in Figure 7.1, we suggest that if mentor training wishes to contribute to mentor teachers' capacity for adaptive response, it is likely to require attention for all four components of being adaptive. We suggest that developers of mentor trainings use the component model to assess which goals they are targeting in their training. This component model may be used to provide mentors with an overview of the knowledge base they are developing, to organize training materials, and to sequence training modules. This may help to move mentor preparation beyond only provision of role clarification, programme information and basic skills for observation and conferencing. Even if it might be too far-reaching to target the development of heuristics for adaptive response at the level of basic preparation, what may well be included is explicit consideration for how novice teachers learn to teach, for personal motives for being a mentor and for personal conceptions of mentoring. Considerations of mentor professional development are likely to tie into broader

issues regarding the agendas of schools and training institutes in partnerships for teacher education and induction, and the positioning of mentors in this collaboration (Clarke, Triggs, & Nielsen, 2014). Should mentoring practice, for instance, be mainly led by novice teachers' concerns, by broad competence frameworks, by novice teachers' tensions of professional identity formation (Pillen, Beijaard, & Den Brok, 2013), by attempts to develop novice teachers' level of self-regulation of learning (Endedijk, 2010), by a focus on specific high-leverage core teaching practices (Grossman et al., 2009; Stanulis & Brondyk, 2013)? Is there a curriculum of core mentoring practices that mentor teachers are expected to be capable of enacting (Schwille, 2008; Stanulis et al., 2018)? We suggest that any training effort needs to recognize that mentors bring their own conceptions and motives to their practice of mentoring novice teachers' learning, and cannot be seen as simply executing a role that is given to them (Hawkey, 1997). More advanced training targeting mentor teachers with some experience in mentoring, might start to explicitly consider the 'core component' of heuristics for adaptive response and creating learning opportunities. Such training would need to help mentor teachers connect knowledge of novice teachers' learning to knowledge of a repertoire of mentoring activities. As mentors develop such heuristics, it is possible that their conceptions of what it means to learn to teach and how this can be supported start to change; other components of the model therefore may require attention at advanced levels of training as well.

7.6.2.2 Activating mentors' adaptive meta-cognition

Consistent with the framework presented in Figure 7.1, we suggest that promoting mentor teachers' capacity for adaptive response to their mentee teachers' learning should be an explicit objective of professional development activities. Based on the work of Lin, Schwartz and Hatano (2005), we suggest that professional development activities should aim to activate mentor teachers' adaptive meta-cognition. Key features for activating adaptive meta-cognition are active decision making in practical situations, and encountering different perspectives on a situation that contain different values. These two features reduce the likelihood that events are seen as routine, or that only surface features of an event are noticed. They promote seeing novelty in events and help to open up problem finding. To engage mentors in active decision making, they may be

asked to develop a response to a case or vignette, to start out from an experience in their own mentoring practice, or they may be asked to develop a more elaborate case from their own mentoring practice (Shulman, 2002). To introduce multiple perspectives on a mentoring situation, questions can be provided for additional information that others would ask based on different goals and values and experiences. This postpones jumping to a solution, and opens op problem finding (Lin et al., 2005). Alternatively, several heuristics could be provided that represent various contrasting understandings of the underlying nature of the situation. Subsequently, discussion may then be framed around the question of 'what is this a case of' (Shulman, 2002) to further stimulate problem finding and integration of multiple perspectives of the situation and potential ways to respond.

7.6.2.3 Using mirrors of practitioner knowledge

Our study provides various representations of mentor teachers' knowledge that might be used to help generate discussion and deliberation among mentor teachers about the nature of being adaptive to novice teachers' learning. The items from the questionnaire, the interview fragments, the list of mentoring activities, the list of constructs, the list of adaptive mentoring activities and, perhaps most of all, the condensed accounts of the 'if…then' heuristics, all constitute partial representations of mentor teachers' practical knowledge related to being adaptive. In piloting our questionnaire for study 1, we experienced that by simply encountering explicated alternative approaches and beliefs, mentor teachers may be incited to reflect on what they are doing and on possible alternatives to their current mentoring practice. Similarly, presenting a list of activities such as those developed in study 2 and 4 may be a simple step-up to open up discussions of what mentor teachers do; for instance, whether they explicitly discuss expectations with the mentee teacher at the beginning of the mentoring relationship. Likewise, presenting a list of constructs such as the one in study 3 may help to generate reflections and discussions on the differences mentor teachers experience between their mentee teachers and how they might respond to these differences.

7.6.2.4 Using techniques for knowledge explication

The repertory-grid technique of sorting cards with mentee teachers' names proved a viable way of getting mentor teachers to talk about differences in their mentee teachers' learning. The technique helped to elicit concrete notions of how mentees were different, how this had manifested itself in their teaching and in their relationship with the mentor, and what mentors had been able to do, to adapt to and work with these differences. Even with a smaller number of card sorts, this may still engage mentor talk close to the lived practice of mentoring and narrative ways of knowing mentoring practice (Shulman, 2002). An alternative would be to let mentors do a 'full card sort', in which a complete set of cards is grouped into piles. It has been suggested that such sorting activities may engage mentor teachers' thinking at the more implicit and non-rational level of holistic images, rather than at an analytical level (Korthagen, 1993). Such an activity could provide an experiential starting point for collaborative learning in a group of mentor teachers or teacher educators, for instance between new/aspiring mentors and more experienced mentors. This may help to develop a more shared discourse of practice (Feiman-Nemser, 2012) that is also attentive to the issue of adaptive response to individual differences in novice teachers' learning.