

Peer to peer feedback : a study on teachers' feedback processes

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**Peer to peer feedback:
A study on teachers' feedback processes**

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Peer to peer feedback: A study on teachers' feedback processes

PROEFSCHRIFT

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aan de Open Universiteit
op gezag van de rector magnificus
prof. mr. A. Oskamp
ten overstaan van een door het
College voor promoties ingestelde commissie
in het openbaar te verdedigen

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om 16.00 uur precies

door

Maria Cornelia Gerardus Thurlings
geboren op 16 september 1982 te Eindhoven

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Ruim vijf jaar geleden begon ik aan een groot avontuur: promoveren bij het Ruud de Moor Centrum (RdMC)¹. Het is nooit gemakkelijk geweest: een half jaar zonder dagelijkse begeleider, scholen die niet mee wilden doen aan het onderzoek, editors van tijdschriften waar je eeuwig op moet wachten, het RdMC bleek een erg dynamische werkomgeving te zijn en er volgde een reorganisatie die er flink inhakte...

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¹ Het Ruud de Moor Centrum is vanaf 24 april 2012 verder gegaan onder de nieuwe naam LOOK (Wetenschappelijk Centrum Leraren Onderzoek)

Ook wil ik Carla, Ed en Marja, José, Kees en Hans, en Bob en Arie bedanken, omdat jullie als school of opleiding toezegden mee te doen aan mijn onderzoek en de organisatorische kant ter plaatse regelden. Bovenal wil ik de (bijna)leraren bedanken die deelnamen. Jullie lieten je filmen, jullie vulden ietwat lange vragenlijsten in en jullie lieten je interviewen. Sommigen zag ik op moeilijke momenten, kwetsbaar en twijfelend over jezelf als leraar. Een enkeling hield het niet droog – en ik mocht daar, met plaatsvervangende schaamte, getuige van zijn. Maar ook zag ik een groot aantal van jullie stralen op het moment dat jullie zélf je doel bereikten. Jullie spat-ten van het scherm en ik voelde plaatsvervangende trots. Beste deelnemers, dank jullie wel, zonder jullie had ik hier niet gestaan.

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Chapter 1

Introduction

1.1 INTRODUCTION

Feedback has long been recognised as a supportive tool for student learning, because research has mainly focused on feedback for pupils and students and on the effects of feedback on their learning outcomes (Hattie & Timperley, 2007; Kluger & DeNisi, 1996; Mory, 2003; Shute, 2008). From Hattie's meta-analysis of meta-analyses (2009), in which he concluded that feedback is effective for student learning, the suggestion can be made that feedback possibly can be an effective tool to support learning processes of any learner.

Consequently, feedback can then provide valuable information also to teachers during their professional development activities. These activities are expected to reinforce the quality of teachers (OC&W, 2011; Van Veen, Zwart, Meirink, & Verloop, 2010). However, until now only a few studies have examined feedback among teachers (Scheeler, Ruhl, & McAfee, 2004).

In our society, online communication tools and social media increasingly influence human life. Moreover, these kinds of tools and media are more and more incorporated into educational activities (Bastiaens, 2007; LeNoue, Hall, & Eighmy, 2011). For instance, many classrooms are equipped with a smart board and computers. Learning processes are therefore also increasingly supported with online tools. The before mentioned teacher professional development activities implement online tools as well. However, so far only few studies explored the characteristics of effective feedback in, for example, online teacher professional development activities (Geister, Konradt, & Hertel, 2006).

These gaps – the lack of research on feedback among teachers and the lack of research on effective feedback in online environments – are addressed in this dissertation. The main aim is to understand feedback processes among teachers in a professional development activity, more specifically, a peer coaching program that is implemented in face-to-face and online settings.

This chapter first focuses on the concept of feedback (Section 1.2). Then, the importance of teacher professional development is addressed (Section 1.3). Next, the peer coaching program is explained which was implemented in our empirical studies as a specific teachers' professional development activity (Section 1.4). Subsequently, the growth of e-learning and online communication is explored (Section 1.5). Based upon these elaborations, the research goal and questions for this dissertation are formulated (Section 1.6) and an outline of the thesis is presented (Section 1.7).

1.2 FEEDBACK

As we already indicated, research on feedback between teachers is scarce (Scheeler et al., 2004). The main subject in most studies so far is feedback from teachers to students. Results and recommendations from these kinds of studies are mixed and sometimes even contrast one another. For instance, some authors suggested to give feedback immediately (e.g., Scheeler & Lee, 2002), whereas others suggested to give feedback in an appropriate timeframe and when feedback is relevant to the learners in such a way that they can use the feedback to improve their performances (e.g., Gibbs & Simpson, 2004).

In their seminal work on feedback to students, Hattie and Timperley defined feedback as “information provided by an agent regarding aspects of one’s performance or understanding” (2007, p. 81). Based on this definition, they built a model that defines effective feedback from teachers to students. This model might elucidate the mixed findings and recommendations.

Hattie and Timperley’s model distinguished four levels on which feedback can be given. These four levels are the task, the process, the self regulation, and the self levels. *Task feedback* is also known as corrective feedback or as Knowledge of Results (Kluger & DeNisi, 1996). Task feedback is more powerful if it is directed at misinterpreted aspects (Hattie & Timperley, 2007). *Process feedback* concerns feedback on strategies learners use to fulfil tasks and is directed at a deeper understanding. *Self regulation feedback* concerns remarks about self-evaluation, encouragement, and motivation. This type of feedback has a major influence on self-efficacy beliefs, attributions of success and failure, and willingness. Examples of feedback at the *self level* are “Well done” and “Good job” and this type of feedback is time and time again given in classrooms. However, Hattie and Timperley (2007) suggested that feedback at the self level is hardly effective, because it lacks information learners can use to improve their performance. Hattie and Timperley (2007) advocated that task feedback should lead to process feedback and process feedback should lead to self regulation feedback. Moreover, they proposed that the level at which feedback is directed has more influence on feedback effectiveness than, for instance, timing.

In addition to these four levels, Hattie and Timperley’s model (2007) distinguished three questions that should be answered in the process of giving effective feedback. These questions are (a) “Where am I going?” which focuses on the desired outcomes or goals, (b) “How am I going?”, which directs at the process a learner is going through, and (c) “Where to next?”, which focuses on the next step.

One former review study explored feedback given to teachers, which provides initial insights to close the gap described in this chapter’s Introduction. Scheeler et al. (2004) reviewed research on feedback among teachers that was published between 1970 and 2000. They found only ten relevant publications. Moreover, no

profound conclusions could be drawn, because these ten publications applied poor research designs and reported inconclusive results. Scheeler et al. (2004) concluded that “despite the obvious limitations, the literature clearly supports three general conclusions that should be adopted into practice: (a) feedback is better than no feedback, (b) immediate feedback is better than delayed feedback, and (c) feedback that is immediate, specific, positive, and corrective holds the most promise for bringing about lasting change in teaching behaviour” (p.68). Moreover, they made a plea for future research on the subject of feedback among teachers.

Scheeler et al. (2004) focused on giving feedback in hierarchical relationships between teachers and their executives and, therefore, their conclusions lack nuances on feedback processes between teachers acting as peers. This dissertation aims to provide these kinds of nuances.

Many definitions of feedback have been reported. These definitions of feedback consist of at least one of the following four elements: (a) data on the actual performance of learners, (b) data on the standard of the performance, (c) a mechanism for comparing the actual performance and the standard performance, and (d) a mechanism that can be used to close the gap between the actual and standard performance (Black & Wiliam, 1998a). This dissertation defines feedback as “information that allows for comparison between an actual and a desired outcome” (Mory, 2003, p. 746), which is suggested as a definition of feedback in non-instructional contexts and aligns with the peer coaching program’s context (see Section 1.4). Feedback in the empirical studies is given by peer coaches to coached teachers and by coached teachers to themselves.

1.3 TEACHER PROFESSIONAL DEVELOPMENT

Professional development is believed to be one of the ways to preserve the quality of education (OC&W, 2011; OECD, 2005; Van Veen et al., 2010), especially when teacher shortages are emerging. Teacher shortages indicate that there is a lack of teachers for conducting lessons. This lack is expected to become even larger in Northern Europe, because many teachers will retire within ten to 15 years (OECD, 2002; Stijnen, 2003).

What might be even more critical than the number of teachers is the quality of teachers. Hattie (2009) has shown that skilful teachers have a major effect on student learning outcomes. In other words, the quality of teachers influences the quality of education. Proficient teachers support their students in achieving high learning outcomes, in such a way that these students can attain the highest educational degree they can. A highly educated population ultimately helps societies to remain among the top of knowledge economies.

There are many approaches to teacher professional development, that range from formal courses, to networked learning, to coaching, to Communities of Practice, and other informal learning activities. There is a debate going about which kinds of activities are more effective. In a recent review, Van Veen et al. (2010) attempted to gain insights into which characteristics make formal professional development activities effective. They concluded that formal professional development activities should have a focus on pedagogical content knowledge. These activities should be inquiry-based and teachers should actively participate. Furthermore, teachers should collaborate with each other and other experts and should share and develop knowledge. Professional development activities should span over a greater period of time and relate to school policy. Finally, the activities should be based on a 'theory of improvement', which reasons why the characteristics of a specific activity relate to the desired learning outcomes for teachers.

An example of a professional development activity is peer coaching, which was introduced 25 to 30 years ago by Showers and Joyce as a tool for staff development (Showers, 1985; Showers & Joyce, 1996). Peer coaching is a process in which two or more teachers work together to reflect on their teaching practice in order to solve problems that they experience in their teaching practice (Robbins, 1991). Ever since, many peer coaching programs have been introduced (e.g., Licklider, 1995; McAllister & Neubert, 1995).

Ackland (1991) reviewed literature on peer coaching programs and found three common characteristics of these programs. First, peer coaching is non evaluative. That is, no decisions are made about the performance of the participating teachers and as a consequence, peer coaching is a safe environment. Second, peer coaching is based on observations of classrooms followed by constructive feedback. In some peer coaching programs, these observations involve videotaping of the coached teachers' classrooms, but in most programs, the coaches visit the teachers' classroom and conduct the observations in real time. The constructive feedback varies between (a) mirroring: the coaches collect data and give it to the teachers to analyse this data themselves, (b) collaborative coaching: the coaches and teachers collaborate to find ways to improve teaching behaviours, and (c) expert coaching: the coaches are mentors who give specific suggestions to the teachers. Third, peer coaching is directed at improving instructional techniques and teacher behaviours.

Ackland (1991) also explains how peer coaching helps teachers to change their instructional techniques. First, peer coaching encourages teachers to become aware of their teaching behaviours. In addition, the use of constructive feedback, either by mirroring, collaborative coaching, or expert coaching, leads to changing behaviours. Finally, teachers are supported by their coaches.

Several studies explored the effects of peer coaching. For instance, Swafford's (1998) and Sparks and Bruder's (1987) participants reported that they implemented new teaching behaviours and, as a consequence of the support of their peers, felt

confident to experiment with these teaching behaviours. Licklider (1995) and Kohler, McCullough Crilley, Shearer, and Good (1997) found positive effects of a peer coaching program on teacher behaviours. Showers and Joyce concluded that peer coaching leads to collegiality, transfer of training, teacher development, and school development (Showers, 1985; Showers & Joyce, 1996).

A specific peer coaching program is the Video Intervention Peer coaching procedure (VIP; Jeninga, 2003). This VIP procedure was implemented in the empirical studies of this dissertation. As such, the context in which feedback was examined is controlled for. Because the VIP procedure is not explicitly elaborated on in each chapter, the next section (Section 1.4) explains the goals, elements, and procedure of the program.

1.4 THE PEER COACHING PROGRAM: THE VIDEO INTERVISION PEER COACHING PROCEDURE

Video Intervention Peer coaching procedure has two aims (VIP; Jeninga, 2003). The first aim is to guide teachers to improve certain teaching behaviours. The second aim is to help teachers to develop coaching skills and attitude.

The VIP procedure emphasizes reciprocal coaching in a peer group, that usually consists of three teachers (Jeninga, 2003). The VIP procedure defines two roles for teachers, namely that of the *coached teacher* and that of the *peer coach*. Teachers switch between these roles. During each turn, there is one coached teacher, which implies that the other two teachers are peer coaches. By switching roles in each session, each teacher is the coached teacher once and the peer coach twice.

The VIP procedure has a cyclic workflow that consists of four cyclic steps (Jeninga, 2003). In the *first* step, teachers decide which teaching behaviours they want to improve (e.g., being more consistent in applying classroom rules or providing more effective instruction in less time) and they videotape this specific teaching behaviour.

In the *second* step, teachers meet in a peer coaching session. The coached teachers briefly introduce the teaching behaviour that they want to improve and show the illustrative video. Subsequently, the peer coaches use solution-focused thinking (Jackson & McKergow, 2002), which supports the coached teachers in proposing a solution to tackle their teaching behaviours. Solution-focused thinking is characterized by asking open-ended questions, defining a goal, and distinguishing small steps to achieve that goal. At the end of each teacher's turn, the goals and actions are written down in an Action Improvement Plan.

In the *third* step, teachers implement their formulated actions, which lead to altered teaching behaviours. These changed behaviours are videotaped.

In the *fourth* step, the peer group meets in another peer coaching session. The coached teachers elaborate on their altered behaviour and show the newly-made video. The coached teachers and peer coaches give feedback on the changed teacher behaviours. Next, the coached teachers evaluate their changed behaviours. The coached teachers give themselves a grade from 1 to 10 that expresses their satisfaction with respect to the extent that they have reached their goal. In addition, the coached teachers are asked what they can do to raise this grade (e.g., giving an 8 instead of a 7). The feedback and evaluation are written down in the Action Improvement Plan. Finally, the coached teachers decide if they are willing to change another teaching behaviour or to further improve the current behaviour. In the first case, the cycle begins again, and, in the latter case, their goals and actions are reformulated or adapted.

Peer groups are facilitated by a process supervisor. Process supervisors act as chairmen during the sessions. Moreover, they model coaching behaviours and solution-focused thinking and they explicitly reflect on the teachers' coaching behaviours (Jeninga, 2003).

1.5 E-LEARNING AND ONLINE COMMUNICATION

Our society is more and more becoming digitalized. The Internet and social networking sites play pivotal roles in human life. As a consequence of this digital revolution, e-learning has taken an enormous leap (Bastiaens, 2007; LeNoue et al., 2011). It is suggested that its time and place independency allows more people to follow e-courses on almost any subject (Bernard et al., 2004). An example of e-learning is online courses at Open Universities.

A dimension of e-learning and online communication is time dependence, with *synchronous* communication at the one hand and *asynchronous* communication on the other (Bernard et al., 2004; Holmes, 2004). In the case of synchronous communication, learners are place independent, but not time independent. This indicates that they meet online at a pre-arranged time. Elluminate, MSN Messenger, and Skype are some examples of synchronous communication tools. In the case of asynchronous communication, learners are independent of time and place. This indicates that they can go online anytime and anyplace and, for instance, contribute to discussions or watch a recorded lesson. BlackBoard, Moodle, and e-mail are some examples of these asynchronous tools. In the course of this dissertation, the dimension of time dependence is explored. In one study (Chapter 3), the VIP procedure is implemented in an asynchronous environment; in another study (Chapter 6), the VIP procedure is used in a synchronous online environment.

Many factors are suggested to influence online communication processes. One of these factors are feelings of social presence (Kreijns, Kirschner, & Vermeulen,

submitted; Short, Williams, & Christie, 1976). Social presence is defined as “the degree of salience of the other person in the interaction and the consequent salience of the interpersonal relationships” (Short et al., 1976, p. 65). In other words, it concerns the feeling of being aware that other persons are ‘real’ and lifelike in the online communication (Kreijns, Kirschner, Jochems, & van Buuren, 2011). Thus, feelings of social presence are expected to influence online interaction, which in turn, is expected to influence learning processes (Tu, 2000; Tu & Mclsaac, 2002). The study described in Chapter 6 incorporates the influence of social presence on feedback processes.

1.6 GOAL AND RESEARCH QUESTIONS

This dissertation aims to examine feedback processes among teachers in face-to-face and online peer coaching (i.e., the VIP procedure) as part of their professional development. The research questions are formulated as follows:

1. What is known about feedback among teachers in professional development activities?
2. Which characteristics of feedback are considered effective for learning?
3. Do characteristics of feedback that are considered effective for learning depend on learning theories?
4. Utilizing the conclusions of questions 1, 2, and 3, how can the concept of feedback be operationalized?
5. To what extent does coherence exist between effective observed and effective perceived feedback in face-to-face peer coaching?
6. To what extent does coherence exist between effective observed and effective perceived feedback in online peer coaching and to what extent do feelings of social presence influence this coherence?
7. To what extent differs the coherence between effective observed and effective perceived feedback in face-to-face versus online peer coaching?

Each chapter focuses on one or two of these questions. The questions are arranged into three themes: a theoretical perspective (research questions 1, 2, and 3), a design perspective (research question 4), and the integrated findings (research questions 5, 6, and 7). Figure 1.1 shows how these themes are connected to the chapters.

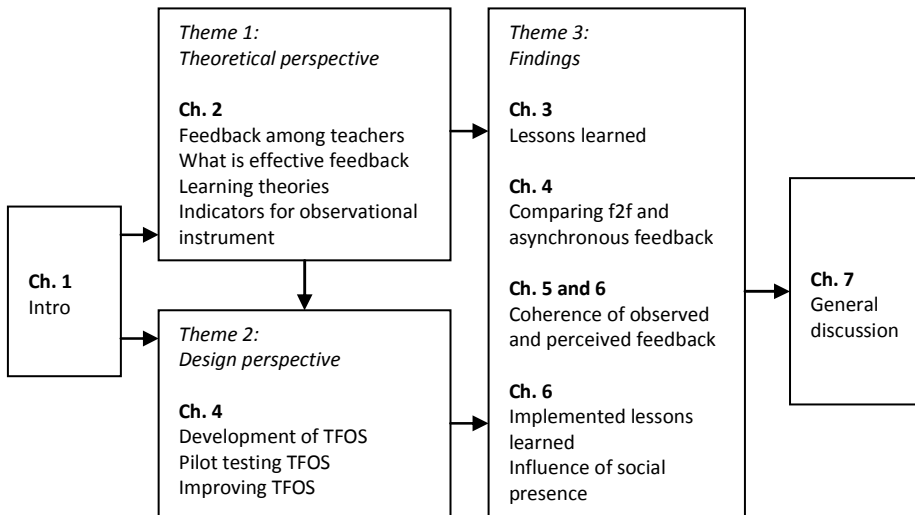


Figure 1.1 Overview of the dissertation, the three themes, and the chapters

1.7 OUTLINE OF THE DISSERTATION

Chapter 2 describes a systematic literature review that aims to understand which characteristics of feedback are effective for learning. The chapter proposes that the characteristics of effective feedback and feedback processes depend on the learning theory adhered to. In addition, the chapter aims to review research on feedback among teachers in order to establish indications for developing an observational instrument.

Chapter 3 reports a pilot study, in which one group of teachers participated in the VIP procedure. They peer coached each other in an online asynchronous environment. The pilot was supposed to run for six months, however, the interaction stopped after about three months. The chapter intends to gain insights in why the teachers stopped interacting. The online discussions were observed and the teachers were interviewed.

Chapter 4 addresses the development of the observational instrument: the Teacher Feedback Observation Scheme (TFOS). The TFOS was used to examine several peer coaching sessions, in which 12 secondary education teachers participated. In addition, the online discussions from the pilot study described in Chapter 3 were examined applying the TFOS, in order to explore feedback patterns in face-to-face and online peer coaching.

Chapter 5 studies 12 primary school teachers who applied the VIP procedure in face-to-face settings. The TFOS was adapted based on the preliminary results de-

scribed in Chapter 4. This modified TFOS was used to analyse the peer coaching sessions. In addition, teachers completed questionnaires after the sessions, that intended to survey their perceptions of feedback and they were interviewed after the trajectory. This study aims to investigate whether the observations of feedback corroborated with the perceptions of feedback.

In *Chapter 6*, the VIP procedure was applied in an online synchronous environment and 16 student teachers participated. The methodology of Chapter 5 was used and the questionnaires additionally addressed social presence, which is believed to influence online communication and consequently feedback processes. Similar to Chapter 5, this study aims to explore whether the observations of feedback corroborated with perceptions of feedback, and, in addition, how feelings of social presence influence the coherence between observed and perceived feedback.

Chapter 7 discusses the findings for each of the three themes: the theoretical perspective, the design perspective, and integrated findings of the studies. In addition, strengths and limitations of the studies are addressed. Subsequently, suggestions for future research are provided, and finally, implications for practice are reported.

Chapter 2

Understanding feedback: A learning theory perspective

This chapter is based upon:

Thurlings, M., Vermeulen, M., Bastiaens, Th., & Stijnen, P. (submitted). Understanding feedback: A learning theory perspective.

2.1 INTRODUCTION

In this chapter, we focus on feedback literature in order to provide insights into the effectiveness of feedback. More specifically, we aim to review research on feedback among teachers in peer-to-peer situations.

This chapter proposes that the characteristics of effective feedback and feedback processes are related to a specific learning theory from which learners, either students or teachers, are facilitated. For instance, in behaviourism, feedback can be positive or negative, depending on whether teachers want to reinforce and encourage student behaviour or not. Or in meta cognitivism, feedback can be directed at the “learning to learn” processes, in such a way that learners can develop themselves as self-regulated learners. As a consequence of these differences, characteristics of effective feedback and feedback processes are expected to differ among learning theories.

In order to test this proposition and to provide insights into feedback among teachers, a systematic literature review (Petticrew & Roberts, 2006) was conducted. Research questions were formulated as follows:

1. To what extent does a learning theory influence characteristics of effective feedback?
2. To what extent does a learning theory influence feedback processes?

This chapter describes indicators, which are used to develop an observational instrument for analyzing peer-to-peer teacher feedback. This observational instrument is used in a context of *learning from experiences*, namely peer coaching (see Chapters 4, 5, and 6). As such, the *to be observed* feedback is given in social constructivism and cognitive apprenticeship method.

This chapter first explains how the systematic literature review was conducted: the search process (Section 2.2.1) and data-analysis (Section 2.2.2) are addressed and the learning theories are described (Section 2.2.3). Next, the findings regarding the research questions are presented (Sections 2.3.1 and 2.3.2). In addition, findings are reported on what effective feedback to teachers is (Section 2.3.2), which leads to the indicators needed for the development of an observational instrument. Subsequently, the chapter concludes and discusses the findings, describes limitations, implications for practice, and implications for future research (Section 2.4).

2.2 METHOD

To our knowledge, only one review was previously published that focused on performance feedback given to teachers. Scheeler, Ruhl, and McAfee (2004) aimed to determine which attributes of performance feedback given to teachers are effective. They found only ten articles that matched their criteria, published between

1970 and 2000. They concluded that “(a) feedback is better than no feedback, (b) immediate feedback is better than delayed feedback, and (c) feedback that is immediate, specific, positive, and corrective holds the most promise for bringing about lasting change in teaching behaviour” (p. 68). This review updates their findings. Section 7.1.1 elaborates on how this dissertation contributes to Scheeler et al.’s (2004) findings.

This section first addresses the search and selection process (Section 2.2.1) and then elaborates on the data-analysis (Section 2.2.2). Finally, six learning theories and their implications for feedback processes are described (Section 2.2.3).

2.2.1 Search and selection process

ERIC, PsycINFO, and Dissertation Abstracts were explored using search terms based on Scheeler et al.’s (2004) review. These (e.g., corrective feedback and peer coaching) and other search terms (e.g., professional development) were used, because the empirical studies in this dissertation examine peer-to-peer feedback among teachers.

Based on Scheeler et al.’s (2004) findings, in this review, we expected to find only a few publications that specifically examined feedback between teachers. Therefore, from the start, the scope of the review was expanded to research on feedback to students. The search covered literature from January 2000 to June 2009. Some older seminal publications were also included. These were found by means of snowballing (Cordingley, Bell, Thomason, & Firth, 2005; Peticrew & Roberts, 2006), that is, literature cited in the already included articles was examined and included if it met our criteria.

In ERIC, 295 articles were found and in PsycINFO, 274 articles, including 13 dissertations, were retrieved. The selection process encompassed two steps. In the first step, the title and abstract, as depicted by the databases, were judged on possible relevance for the literature review as well as relevance for the empirical research. The criteria for inclusion were: feedback as a subject of the study, a clear point of view on learning, and relevance for the forthcoming empirical studies.

In the second step, the selected articles’ research goals and questions, methods, results, and conclusions were summarized. Using the summaries and the three criteria, it was decided whether the article would be included in the review. Finally, 52 articles were selected.

2.2.2 Data-analysis

Six learning theories were distinguished to perform the data-analysis (Boekaerts & Simons, 1995): behaviourism, cognitivism, social cultural theory, meta-cognitivism,

social constructivism, and cognitive apprenticeship method. These learning theories cover a chronological development. The data-analysis consisted of five steps.

First, a description of each learning theory was established (see Section 2.2.3). These descriptions were used to determine the learning theory from which each article reasoned. For each reviewed article, the authors' definition of learning and the intervention that they implemented was compared with these descriptions. Based on this comparison, the learning theory from which each article reasoned was set. Three articles appeared to hold two learning perspectives and were therefore assigned to both learning theories. Five articles were based on behaviourism, nine on cognitivism, 12 on social cultural theory, five on meta-cognitivism, 16 on social constructivism, and seven on cognitive apprenticeship method. An overview of the reviewed articles that stem from each learning theory is presented in the Appendix.

Second, separately for each learning theory, all mentioned characteristics of feedback in the reviewed articles were listed. In addition, these characteristics were clustered into five categories: feedback characteristics, task-related characteristics, timing, affective and emotional characteristics, and effects on learners. These findings are presented in Section 2.3.1.

Third, based on Boekaerts and Simons (1995), Mory (2003), and Scheeler et al. (2004), models of feedback processes were built for each learning theory. A learning theory "comprises a set of constructs linking observed changes in performance with what is thought to bring about those changes" (Driscoll, 2000, p. 11). Driscoll further explains that learning theories have three basic components: the inputs, the means, and the results. In other words, each learning theory explains which mechanisms lead to certain learning outcomes. Consequently, each learning theory envisions another feedback process (see Section 2.2.3). The feedback models capture the essence of feedback processes: receivers (i.e., the learners), providers (e.g., teachers, peers), feedback itself, the receivers' stage before and after feedback is given, and the outcomes (Boekaerts & Simons, 1995; Mory, 2003; Scheeler et al., 2004). The created feedback models (see Figures 2.1, 2.2, 2.3, and 2.4) were filled with findings from the reviewed articles. Both proposed and proven relations were included. For the sake of readability the figures only show the relations between receivers, providers, feedback, and learning outcomes and do not show the findings of the reviewed articles. The findings are presented in Section 2.3.2.

Fourth, all models were examined. This examination distinguished (a) whether authors only proposed what feedback processes are like, (b) whether they investigated perceptions, and (c) whether they statistically tested (parts of the) feedback models. In other words, this method makes a distinction between proposed and proven feedback processes and can hopefully make more profound claims of effective feedback and feedback processes in all six learning theories. The findings are presented in Section 2.3.2.

Finally, those articles that did focus on teachers, student teachers or adult learners were studied more closely. The examination of the models was used in order to draw conclusions on what effective feedback among teachers is like. These results are also presented in Section 2.3.2.

2.2.3 Descriptions of learning theories

Behaviourism focuses on visible behaviour of students, which can be manipulated by means of stimuli such as praise and punishment (Atkinson, Atkinson, & Hilgard, 1983; Skinner, 1968). Teachers guide students through the curriculum in small steps. Students are requested to reproduce what the teachers have told them. This indicates that feedback processes in behaviourism are straightforward and linear: feedback is given, and consequently, an outcome occurs (see Figure 2.1).

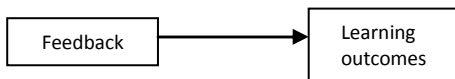


Figure 2.1 The feedback model for behaviourism

Cognitivism stresses human information processing (Newell & Simon, 1972; Shuell, 1986). Teachers structure the curriculum and guide students through the curriculum as students actively process, decode, and use the curriculum. The students learn relationships between objects. This indicates that feedback processes start with giving feedback, which is then processed by the learners, finalizing in outcomes (see Figure 2.2). Similar to behaviourism, the learning process is linear.

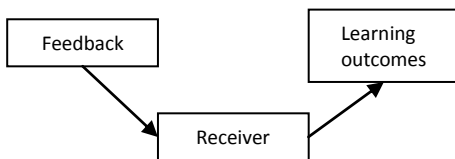


Figure 2.2 The feedback model for cognitivism

Social cultural theory highlights human intentions and possibilities and how these can be developed (Vygotsky, 1978). Dialogue between teachers and students is fundamental to this learning theory. Discussing teachers' actions supports students to proceed through zones of proximal development. This indicates that feedback processes start with learners at a certain stage. Feedback is given to guide learners to the next stage (i.e., zone of proximal development), in which outcomes are achieved (see Figure 2.3). Similar to behaviourism and cognitivism, the learning processes are linear.

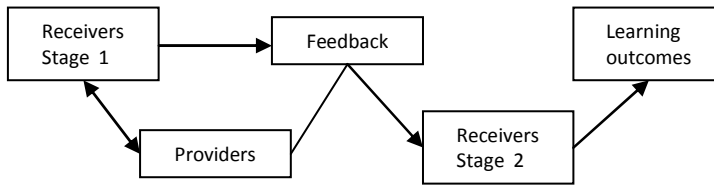


Figure 2.3 The feedback model for social cultural theory

Meta cognitivism emphasizes students learn to learn (Brown, 1987; Garner, 1987). Self-regulated learning (Boekaerts, Pintrich, & Zeidner, 2000) fits into this learning theory. Teachers guide learners in their (self-regulated) learning processes, such as planning and monitoring, and the learners are responsible for their own learning. This indicates that the feedback process starts with learners at a beginning stage. Then, teachers give feedback and the learners flow through to another stage. As the process is continuous, a loop takes learners back to yet another beginning stage (see Figure 2.4). In contrast to the former learning theories, the learning processes are cyclic.

Social constructivism focuses on how learners are actively engaged in constructing their knowledge (VanderBilt cognition and technology group, 1990; Jonassen, 1991; Paris & Byrne, 1989). Prior knowledge is the starting point for learning. Learning occurs by studying multiple examples and by de-contextualisation of the heuristics. Teachers guide this process. Peers are involved in the learning processes and students collaborate. This indicates that the feedback process starts with learners at a beginning stage. Multiple peers and teachers give feedback. Then, because the learning is continuous, learners move to another stage, which becomes a new beginning stage (see Figure 2.4). Similar to meta cognitivism, the learning processes are cyclic.

Cognitive apprenticeship method originates from medieval apprenticeships. Teachers model certain skills and then guide learners by giving hints and feedback so that students acquire the skills (Brown, Collins, & Duguid, 1989). Teachers fade out their guiding processes, so that eventually the learners can perform the skills individually. This indicates that learners start at a beginning stage. Teachers and peers give feedback and the learners flow through to another stage. Because the learning is continuous, the process leaps back to yet another beginning stage (see Figure 2.4). Similar to meta cognitivism and social constructivism, the learning processes are cyclic.

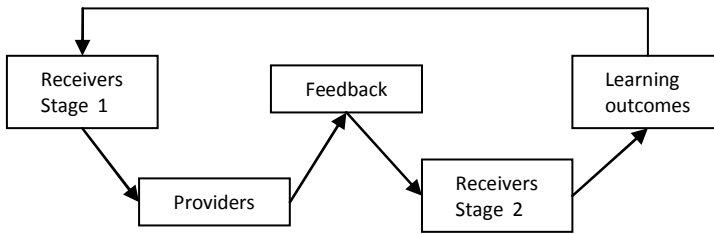


Figure 2.4 The feedback model for meta cognitivism, social constructivism, and cognitive apprenticeship method

2.3 FINDINGS

2.3.1 Characteristics of effective feedback and learning theories

Characteristics of feedback fell into five clusters (see also Section 2.2.2). These clusters are the characteristics that describe feedback (Section 2.3.1.1), task-related characteristics (Section 2.3.1.2), timing (Section 2.3.1.3), affective and emotional characteristics (Section 2.3.1.4), and effects on learners (Section 2.3.1.5). The following sections compare and contrast the descriptions provided in the reviewed articles. Both the tables and the accompanying texts reflect a chronological order, that is, they start with behaviourism and end with cognitive apprenticeship method. Because all mentioned characteristics from all reviewed articles are listed, some overlap may emerge in the tables and accompanying texts.

2.3.1.1 Feedback characteristics

Table 2.1 lists all mentioned feedback characteristics, which are addressed in this section. From a behaviouristic point of view, feedback should be instructional (Werts, Wolery, Holcombe, & Gast, 1995), which can vary between parallel, expansive or novel. In addition, from a behaviouristic point of view, corrective feedback is suggested to be effective (Goodman, Brady, Duffy, Scott, & Pollard, 2008). Ferreira, Moore, and Mellish (2007) distinguished two forms of corrective feedback: the *Giving Answers Strategy* (GAS) and the *Prompting Answers Strategy* (PAS). In the GAS strategy, teachers provide the correct answer; in the PAS strategy, teachers support and evoke learners to provide the correct answer. Articles from behaviourism (e.g., Goodman et al., 2008), cognitivism (e.g., Shute, 2008), and social cultural theory (Brinko, 1993; Yeh & Lo, 2009) indicated that feedback should be specific and clear.

Table 2.1 Overview of feedback characteristics

Characteristic	Behaviourism	Cognitivism	Social cultural theory	Meta cognitivism	Social constructivism	Cognitive apprenticeship
Instructional (Parallel, expansive, novel)	x					
Corrective (GAS, PAS)	x					
Specific	x	x	x	x		
Clear		x				
Form and content		x				
Product and process		x				
Neutral		x				
Unbiased, objective		x	x		x	x
Concrete			x			
Accurate, irrefutable			x			
Summative and formative			x			
Relevant, meaningful			x	x		
Consistent			x	x		
Balanced between positive and negative			x		x	
Descriptive				x		
Leaving control to learner				x		
Useful				x		
Credibility				x		
Positive				x		
Explorative				x		
Sufficient				x	x	
Constructive					x	
Balanced with grade					x	
Consequence of performance					x	
Based on actual data					x	x
Non summative					x	x

From a cognitivistic point of view, feedback can vary between form and content feedback (Ashwell, 2000) and between process and product feedback (Hyland, 2001). In addition, feedback should be neutral (Shute, 2008). Moreover, cognitivism (Shute, 2008), social cultural theory (Lehrman-Waterman & Ladany, 2001), social

constructivism (Swick, Hall, & Beresin, 2006), and cognitive apprenticeship method (Swick, et al., 2006) suggested to give unbiased and objective feedback.

Reasoning from the social cultural theory, feedback should be concrete, accurate, irrefutable, summative, and formative (see Table 2.1; Brinko, 1993; Lehrman-Waterman & Ladany, 2001). Both in social cultural theory (Brinko, 1993; Lehrman-Waterman & Ladany, 2001; Ovando, 2005) and meta cognitivism (Hawk & Shah, 2008; Ilgen, Fisher, & Taylor, 1979) feedback should be relevant, meaningful, and consistent. Articles from social cultural theory (Brinko, 1993; Lehrman-Waterman & Ladany, 2001) and social constructivism perspective (Swick et al., 2006; Weaver, 2006) recommended that feedback should be balanced between positive and negative comments.

From meta cognitivism, feedback should be descriptive (Hawk & Shah, 2008). This aligns with behaviourism, cognitivism, and from social cultural theory, which suggested that feedback should be specific and clear. In addition, from meta cognitivism, feedback should leave the control with the learners (Hawk & Shah, 2008; Nicol & McFarlane-Dick, 2006; Sadler, 1989). Furthermore, feedback should be useful, credible, positive, and explorative (Hawk & Shah, 2008; Ilgen et al., 1979). In addition, articles from meta cognitivism (Hawk & Shah, 2008) and social constructivism (Gibbs & Simpson, 2004; Tillema & Smith, 2000) indicated that feedback should be sufficient.

Reasoning from social constructivism, feedback should be constructive and balanced with the grade (Weaver, 2006) and it is suggested that feedback is a consequence of performance (Hattie & Timperley, 2007). Finally, both from social constructivism and cognitive apprenticeship method feedback should be based on actual data and non summative (Swick et al., 2006).

2.3.1.2 *Task-related characteristics*

Table 2.2 shows the task-related characteristics. First, Shute (2008), reasoning from cognitivism, indicated that the extent of feedback's effectiveness depends on the task. Except for articles with a behaviouristic and cognitive apprenticeship perspective, it is suggested that feedback should be task- or goal-related (see Table 2.2; Black & Wiliam, 1998a; Brinko, 1993; Sadler, 1989; Shute, 2008). Brinko (1993), reasoning from the social cultural theory, proposed that feedback should be directed at behaviour rather than on the receiver.

In addition, articles from a meta cognitivist approach implied that feedback should provide information about learners' learning processes (Hawk & Shah, 2008; Nicol & McFarlane-Dick, 2006), reflecting the learning to learn view. Articles with a social constructivist view also indicated that feedback should be directed at the appropriate level (Hattie & Timperley, 2007) and that feedback should relate to learners' beliefs and perceptions of their performance (Hattie & Timperley, 2007;

Tillema & Smith, 2000). Finally, feedback should incorporate the next step of the learners' progress, that is, if one reasons from a social constructivistic (Black & William, 1998b; Gibbs & Simpson, 2004; Hattie & Timperley, 2007) or cognitive apprenticeship perspective (Swick et al., 2006). This reflects the ongoing learning and feedback processes in these learning theories.

Table 2.2 Overview of task-related characteristics

Task-related characteristics	Behaviourism	Cognitivism	Social cultural theory	Meta cognitivism	Social constructivism	Cognitive apprenticeship
Depended on task		x				
Focused on/related to task		x			x	
Focused on behaviour			x			
Related to goals			x	x	x	
Provide high-quality info about learner's learning				x		
Targeted at appropriate level (task, process, regulation)					x	
Related to learner's beliefs/perceptions of their performance					x	
Where to next					x	
Contain info about progress					x	x

2.3.1.3 Timing

As Table 2.3 shows, from a behaviouristic perspective (Goodman et al., 2008; Scheeller & Lee, 2002), feedback should be given immediately. With a cognitive point of view, Shute (2008) indicated that feedback should be timed in an appropriate time frame, and, from social cultural theory, Brinko (1993) suggested to give feedback as soon as possible.

Furthermore, articles from social cultural theory (Brinko, 1993; Lehrman-Waterman & Ladany, 2001), meta cognitivism (Ilgen et al., 1979), and social constructivism (Black & Wiliam, 1998a; Black & Wiliam, 1998b) argued that feedback should be given frequently.

Authors that used meta cognitivism and social constructivism as a starting point implied that when timing feedback, learners should still remember their actions so that feedback is relevant to them (Hawk & Shah, 2008; Mory, 2003). This reflects the ongoing learning and feedback processes of these learning theories. However, no articles from the cognitive apprenticeship method mentioned timing.

Table 2.3 Overview of timing

Timing	Behaviourism	Cognitivism	Social cultural theory	Meta cognitivism	Social constructivism	Cognitive apprenticeship
Immediately	x					
In appropriate time frame		x				
As soon as possible			x			
Frequent			x	x	x	
When learners remember their actions/when still relevant				x	x	

2.3.1.4 *Affective and emotional characteristics*

Table 2.4 shows that the reviewed articles on behaviourism did not consider any affective or emotional characteristics. Articles based on cognitivism suggested to take the receivers into account, for instance, by being encouraging (Hyland, 2001; Kluger & DeNisi, 1996). In addition, feedback should be supportive, according to authors from a cognitivistic (Hyland, 2001) and meta cognitivistic (Hawk & Shah, 2008) point of view. Articles with a cognitive, social cultural, meta cognitive, social constructive, and cognitive apprenticeship perspective (e.g., Brinko, 1993; Hyland, 2001; Landry, Anthony, Swank, & Monseque-Bailey, 2009; Licklider, 1995; Manouchehri, 2002; Nicol & McFarlane-Dick, 2006) indicated that feedback receivers should have an opportunity to respond to feedback and engage in a dialogue with providers, and in addition, feedback should be given in a context of collaboration.

From social cultural theory, learners should be taken into account, by being attentive to the receivers’ locus of control and self-esteem (Brinko, 1993). From meta cognitivism, feedback should also attend to learners’ self-esteem (Ilgen et al., 1979), be respectful, and encourage positive motivational beliefs (Hawk & Shah, 2008). Finally, from a social constructive (Swick et al., 2006) and cognitive apprenticeship view (Swick et al., 2006), feedback should be mutual. This reflects the collaboration and group work that are part of these learning theories and connects to the cyclic learning processes of these learning theories.

Table 2.4 Overview of affective and emotional characteristics

Affective/emotional	Behaviourism	Cognitivism	Social cultural theory	Meta cognitivism	Social constructivism	Cognitive apprenticeship
Encouraging		x				
Supporting		x		x		
Giving opportunity to respond, dialogue/context of collaboration		x	x	x	x	x
Sensitive to receiver's locus of control			x			
Self-esteem			x	x		
Respectful				x		
Encourages positive motivational beliefs				x		
Mutual					x	x

2.3.1.5 Effects on learners

Table 2.5 shows that the reviewed articles on behaviourism and cognitive apprenticeship method did not consider any effects on learners. Articles based on cognitivism indicated that feedback should be focused on improvement (Hyland, 2001; Kluger & DeNisi, 1996). Articles from the social cultural theory suggested that feedback should create cognitive dissonance (Brinko, 1993).

From a meta cognitivistic view, it is important that feedback supports learners to become familiar with the standard aimed for, to know the gap between their actual and the desired performance, and then to close this gap (Hawk & Shah, 2008; Nicol & McFarlane-Dick, 2006; Sadler, 1989). This reflects the learning to learn ideas from this theory. Similarly, from social constructivism perspective (Black & Wiliam, 1998b; Gibbs & Simpson, 2004), feedback should support the learners in closing the gap between their actual and the desired performance. In addition, from a social constructivistic view it is also important that feedback should be acted upon (Gibbs & Simpson, 2004; Segers, Gijbels, & Thurlings, 2008).

2.3.2 Feedback processes and learning theories

Section 2.3.1 attended to the first research question (see Section 2.1) and addressed mentioned characteristics of feedback. The second research question focuses on the feedback process as a whole and is addressed in this section (Section 2.3.2), which first describes the *feedback models*, then further *examines the models*, and finally, addresses findings for *effective feedback to teachers*, student teachers, and adult learners.

Table 2.5 Overview of effects on learners

Effect on learners	Behaviourism	Cognitivism	Social cultural theory	Meta cognitivism	Social constructivism	Cognitive apprenticeship
Focused on improvement		x				
Creating cognitive dissonance			x			
Supporting learner in getting clear idea of what standard aimed for is				x		
Supporting learner in comparing their performance with standard				x		
Supporting learner to engage in action to close gap				x	x	
Acted upon					x	

2.3.2.1 Behaviourism

Feedback model. From a behaviouristic point of view on learning, the feedback process is uncomplicated (see Figure 2.1). It more or less reflects the black box approach. The reviewed articles all described direct relationships between several types of feedback such as corrective feedback and (learning) outcomes. Learning outcomes in behaviourism were specifically formulated, for instance, an instruction method by teachers (Scheeler & Lee, 2002).

Examination of model. Werts et al. (1995) illustrated mixed results on instructional feedback and Lambert (2000) did not focus on effects of feedback on the students. Therefore, only three of the five reviewed articles provided insights into feedback processes by testing the feedback model. First, Scheeler and Lee (2002) and Goodman et al. (2008) showed in similar studies on the use of a bug-in-the-ear for student teachers, that immediate and corrective feedback leads to the application of a specific teaching behaviour (i.e., the learning outcome). Corrective feedback can be defined as telling the student teachers what to do. In both studies, only three student teachers participated, and therefore, no claims on significance were made.

Second, Ferreira et al. (2007) investigated two approaches to corrective feedback in language education: the GAS strategy in which teachers provide the correct answer, and the PAS strategy in which teachers support and evoke learners to provide the correct answer. Their findings showed that the GAS strategy was applied more often than the PAS strategy; however, the PAS strategy was shown to improve student performances in the classroom significantly.

Effective feedback to teachers. Two articles from a behaviouristic point of view investigated feedback via a bug-in-the-ear and its effects on student teachers' teaching behaviours (Goodman et al., 2008; Scheeler & Lee, 2002). They both concluded that immediate feedback is more effective, and, in addition, Goodman et al. (2008) advised that feedback should be specific and corrective.

2.3.2.2 Cognitivism

Feedback model. In cognitivism, the feedback model is extended with the receiver (see Figure 2.2). The relation between feedback and (learning) outcomes was not always considered as directly, but could be mediated by receivers' actions and/or characteristics (Hyland, 2001; Morra & Asis, 2009; Shute, 2008). In contrast to behaviourism, the reviewed articles mentioned goals in relation to feedback. In addition, articles also focused on what the feedback is aimed, for instance, form and content feedback (Ashwell, 2000) or product and learning process feedback (Hyland, 2001).

Examination of model. Luft (1969) and London and Smither (1995) only proposed on how feedback processes unfold and Hyland (2001) mapped students' perceptions and preferences. Neither of them explored the relations in the feedback model. Therefore, six of the nine reviewed articles showed what feedback should be like in order to improve learning and were included in the examination of the model of cognitivism.

In order to enrich learning outcomes, feedback should be directed at the task (Ashwell, 2000; Kluger & DeNisi, 1996) and be specific, detailed, and clear (Ross & Tronson, 2005; Shute, 2008). Furthermore, feedback should help learners to close the gap between their actual and the desired outcomes. This finding from the reviews by Kluger and DeNisi (1996) and Shute (2008) probably explains that combined form and content feedback was the best condition for students to improve their writing skills (Ashwell, 2000), that the way in which feedback is communicated (i.e., on-tape or written) did not matter (Morra & Asis, 2009), and that the PAS strategy was significantly better in improving students' language skills than the GAS strategy (Ferreira et al., 2007).

Effective feedback to teachers. Two articles from cognitivism focused on workers (London & Smither, 1995; Luft, 1969), which made propositions on feedback processes. However, they did not empirically test these propositions.

2.3.2.3 Social cultural theory

Feedback model. Even though 12 articles that reasoned from social cultural theory were reviewed, only six of these were included in the model. The other six articles did not describe or investigate relations that could be included in the model (Chi, 1996; Chi, Siler, Jeong, Yamauchi, & Hausmann, 2001; Chin, 2006; Oliver, 2000; Ovando, 2005; Tuzi, 2001).

In social cultural theory, the feedback process is more complex than in behaviourism and cognitivism (see Figure 2.3). Receivers and their characteristics influence the process, and therefore, the relations within the model are not straightforward. In addition, providers are also part of the process (Brinko, 1993). Learners are supposed to be active in their learning process and providers are seen as coaches rather than teachers (Blatt, Confessore, Kallenberg, & Greenberg, 2008; Brinko, 1993). Except for Brinko (1993), no reviewed article mentioned the timing of feedback. Learning outcomes were formulated rather vague, for instance, it promotes learning (Tang & Chow, 2007). Blatt et al.'s (2008) definition of feedback reflects the social cultural approach: "feedback is a dialogue" (p. 329). Finally, goals were also mentioned in relation to feedback.

Examination of model. Most reviewed articles did not provide results on what feedback should be like in order to enhance learning outcomes; they touched upon the subject, but did not investigate (parts of) the process. A few articles illustrated that focussing on a specific issue that learners can improve, for instance by giving form and content feedback, is an appropriate approach (De Kleijn, Mainhard, Meijer, & Brekelmans, 2009; Lehrman-Waterman & Ladany, 2001; Yeh & Lo, 2009).

Only Brinko (1993), in a review on effective feedback for faculty staff, provided insights into what effective feedback is like. Feedback should be mediated by a consultant and given by multiple sources that are of the same or lower status than receivers and receivers should also give feedback to themselves. Feedback should be perceived as credible and well-intentioned. In addition, feedback should be accurate, contain concrete and specific information, be directed at the task, descriptive, and create cognitive dissonance. Concerning receivers, Brinko (1993) recommended to take into account their locus of control and self-esteem, negative feedback should be sandwiched between positive remarks, feedback should reduce uncertainty, be relevant and meaningful, focused on the goals, frequently given, and receivers should welcome feedback.

Effective feedback to teachers. From social cultural theory, Brinko (1993) focused on faculty staff, Tang and Chow (2007) on student teachers, and Lehrman-Waterman and Ladany (2001) on adults. Lehrman-Waterman and Ladany (2001) only investigated perceptions. Tang and Chow (2007) revealed different types of feedback and

Brinko (1993) provided several recommendations on feedback processes. However, none of the authors tested this. Brinko (1993) and Lehrman-Waterman and Ladany (2001) concluded that timely and specific feedback is effective.

2.3.2.4 *Meta cognitivism*

Feedback model. In meta-cognitivism, the feedback model is similar to the one in social cultural theory; however, a loop is included (see Figure 2.4). Yet, only two of the five articles described relationships that were included into the model. First, Ilgen et al. (1979) argued that receivers and their characteristics, for instance their locus of control and self esteem, influence the feedback process. The providers' credibility and power are influential too (Ilgen et al., 1979). Furthermore, providers are no longer seen as an all-knowing figure, but rather receivers and providers interact together, in such a way that feedback is no longer a one way street as it was deemed in behaviourism and cognitivism. In addition, Hawk and Shah (2008) argued that receivers should have an opportunity to revise in order to improve their learning. Ilgen et al. (1979) did not focus on outcomes, because their model explained how receivers' intention to act after they received feedback is influenced.

Examination of model. The five reviewed articles are all reviews or theoretical overviews, and as a consequence, none of the articles provided empirical support for the claims they make. Timperley and Parr (2007) reported on a large scale professional development program, however, they did not elaborate on results of coded feedback episodes.

Sadler (1989), Nicol and McFarlane-Dick (2006), and Hawk and Shah (2008) agreed that learners should become familiar with the gap between their actual and desired outcomes and should be capable of closing this gap. Hawk and Shah (2008) added characteristics of what feedback should be like in order to facilitate learners to close the gap: descriptive, specific, timely, relevant, useful, sufficient, explorative, supportive, and respectful.

Ilgen et al. (1979) illustrated that feedback processes are not straightforward. Instead, receivers proceed through an internal four stage process that manipulates their intention to react to the feedback. This internal process is mainly influenced by the providers' power and credibility.

Effective feedback to teachers. From the meta cognitivist point of view, Ilgen et al. (1979) directed at internal processes of workers and Timperley and Parr (2007) focused on professional development of teachers. None of them concluded or made recommendations what feedback among adult learners or teachers should be like to be effective.

2.3.2.5 *Social constructivism*

Feedback model. Even though 16 articles were reviewed that reasoned from this perspective, three articles were not included in the model, because they did not propose or prove what feedback should be like (Manouchehri, 2002; Schelfhout, Dochy, & Janssens, 2004; Zwart, Bolhuis, Wubbels, & Bergen, 2004).

In social constructivism, the feedback process is complex, due to mediating factors that were described by several authors. Similar to the meta-cognitivist approach, providers' characteristics were considered to influence the process. Teachers fulfilled the role of providers. This seems to contradict this learning approach, in which peers are supposed to fulfil an important role in each others' learning processes (see Section 2.2.3). Nonetheless, providers and receivers were expected to actively act within the feedback process. The description of outcomes was mostly vague, for instance it enhances learning (Black & Wiliam, 1998b), although some authors were more specific. For instance, Landry et al. (2009), in a context of mentoring teachers, described outcomes as become better teachers in writing instruction skills.

Examination of model. Only one reviewed article, out of 16, actually investigated the relation between feedback processes and learning outcomes. Landry et al. (2009) conducted a large scale project on professional development for teachers in the context of writing education. They used a two-by-two framework: teachers either received mentoring or none; and received simple or extended feedback on the progress of their students. In addition, a control group was used. Their study showed that teachers who received mentoring and extended feedback significantly improved writing teacher strategies and that their students achieved better outcomes.

Six reviewed articles examined students' perceptions of the learning environment and feedback (Bing-You, Bertsch, & Thompson, 1998; Brandt, 2008; MacDonald, 2001; Segers et al., 2008; Tillema & Smith, 2000; Weaver, 2006). Three of them found significant results. Bing-You et al. (1998) investigated whether medical students who participated in a workshop on giving effective feedback were more positive about the received feedback than students who did not participate in the workshop. The experimental group's scores were significantly higher on the post questionnaire. Tillema and Smith (2000) studied how students used feedback on the development of their portfolios. They showed that perceptions of feedback significantly influenced perceived outcomes. Segers et al. (2008) investigated how perceptions of the learning environment and feedback influenced approaches to learning. Their findings showed that more positive perceptions of quantity and quality of feedback increased their deep approaches to learning, and in addition, that inten-

tions to do something with the received feedback increased their deep approaches of learning.

Other reviewed articles were reviews of literature (Black & Wiliam, 1998a; Black & Wiliam, 1998b; Gibbs & Simpson, 2004; Hattie & Timperley, 2007; Mory, 2003; Swick et al., 2006). The conditions that support formative assessment described by Gibbs and Simpson (2004) were confirmed by Segers et al. (2008). Mory (2003) explicitly elaborated on effective feedback from a constructivist point of view. Effective feedback guides learners towards internal reality, facilitates knowledge construction, helping to build symbols, and is given in the context of human experience; gives general, mental construction 'tool kits', and the meaning within feedback message is determined by internal understanding.

Summarizing these review studies, effective feedback from a social constructivist point of view is task- and/or goal-directed, focuses on the learning process, specific, in time, frequent, neutral, unbiased, non judging, and supports a dialogue.

Effective feedback to teachers. From social constructivism, Landry et al. (2009) and Zwart et al. (2004) focused on teachers and Manouchechri (2002) and Brandt (2008) on student teachers. Zwart et al. (2004) and Manouchechri (2002) concluded that feedback is part of peer coaching and professional development and Brandt (2008) only investigated perceptions. Landry et al. (2009) showed that teachers involved in mentoring with extended feedback achieved the best outcomes as well as their students. The mentoring consisted of classroom visits, evaluating the classroom environment using the Teacher Behaviour Rating Scale, and follow-up mentoring sessions. However, it was unclear what exactly happened during the mentoring sessions.

2.3.2.6 Cognitive apprenticeship method

Feedback model. The expected model of the cognitive apprenticeship method is similar to the model of social constructivism (see Figure 2.4). Nevertheless, the articles did not show the expected complexity. Relationships were mostly described as being direct, except by Licklider (1995), who argued that the source of feedback, the feedback message, receivers, and the receivers' reflection interact together and influence the effect of feedback. In contrast to social cultural theory, meta cognitivism and social constructivism, the articles reasoning from cognitive apprenticeship method described (learning) outcomes more thoroughly.

Examination of model. Two articles examined relationships between feedback and outcomes. First, Landry et al.'s (2009) study showed that, teachers receiving mentoring and extended feedback significantly improved teacher strategies and student outcomes. Second, Licklider (1995) investigated perceptions of peer feedback

among eleven teachers and short term effects of the peer feedback on classroom instruction. Her findings showed positive short term effects in the classroom; however, it was unclear whether these effects are significant. In addition, teachers reported that they learned more from practicing instruction and giving feedback than from receiving feedback.

Four reviewed articles explored perceptions of learners. Roter et al. (2004) and Goodnough, Osmond, Dibbon, Glassman and Stevens (2009) concluded that students have positive beliefs about received feedback. Sharpe et al. (2003) and Yang and Liu (2004) revealed that (student) teachers believe they received too much positive feedback and preferred receiving constructive and negative feedback, while they were sharing experiences in an online environment.

Swick et al.'s (2006) review indicated what effective feedback is like: face-to-face, ongoing, mutual, timely, based on actual data, non subjective, and non summative.

Effective feedback to teachers. From the cognitive apprenticeship method, Licklider (1995), Yang and Liu (2004), and Landry et al. (2009) focused on teachers, Goodnough et al. (2009) on teachers and student teachers, and Sharpe et al. (2003) on student teachers. The studies of Goodnough et al. (2009), Yang and Liu (2004), and Sharpe et al. (2003) were similar: they investigated perceptions of (student) teachers participating in an online environment in which they discussed their experiences. Their findings indicated that the participants were positive about the online environment and the received feedback. In addition, participants from Yang and Liu's (2004) and Sharpe et al.'s (2003) studies agreed that they received too much positive feedback. Both Licklider (1995) and Landry et al. (2009) demonstrated positive results of feedback on teaching behaviours. In both cases, teachers were coached, either by a peer (Licklider, 1995) or by a mentor (Landry et al., 2009).

The initial aim of this chapter was to review research on feedback between teachers. Because it was expected that only a few relevant studies would be found (see Section 2.2.1), the review's scope also included feedback processes in classrooms. This section has specifically addressed the findings for effective feedback among teachers. In summary, feedback among teachers should be:

- from behaviourism: immediate, specific, and corrective
- from social cultural theory: timely and specific
- from social constructivism: in the context of mentoring
- from cognitive apprenticeship method: in the context of coaching.

No clear recommendations were provided from cognitivism and meta cognitivism.

2.4 CONCLUSIONS AND DISCUSSION

The ultimate aim of this chapter is to find indicators that can be used to develop an observational instrument for peer-to-peer teacher feedback. Two research questions were addressed. These research questions were formulated as follows: (a) To what extent does a learning theory influence characteristics of effective feedback? and (b) To what extent does a learning theory influence feedback processes?

The general conclusions and recommendations described here are built upon the reviewed articles. Only when a majority of authors recommended a specific characteristic for effective feedback, this characteristic was recorded into the conclusions and recommendations. So, suggestions from only one study were not incorporated. In addition, findings from other review studies were given more weight.

Findings from the *first* research question suggest that independent of a learning theory effective feedback is task- or goal-directed, specific, and neutral. In addition, there seem to be four rules of thumb, which reflect the majority of what is believed to be effective in three to five learning theories. First, feedback receivers should have an opportunity to engage in dialogue with feedback providers, except for behaviourism. Second, characteristics of the learners should be taken into account and the learners should be supported and respected, from cognitivism, social cultural theory, and meta cognitivism. Third, feedback should contribute to further improve learning, except for behaviourism. Fourth, timing of feedback should be immediate, according to behaviourism which contrasts the other learning theories, which mainly suggested that feedback should be given as soon as possible and when it is still relevant for the learners. Furthermore, each learning theory seems to lay different emphases on what effective feedback is. For instance, from meta cognitivism, it is important to leave the control with the learners; and from social constructivism, it is important to give constructive feedback.

Regarding the *second* research question, the examined feedback models mainly reflect the learning processes as they are postulated from all learning theories. Except for behaviourism, no articles investigated the whole learning processes. This finding can be explained from the straightforward feedback process in behaviourism, which is easier to study. The feedback processes in all other learning theories are more complex, which makes it more complicated to examine the whole process. In contrast to the first research question, this research question distinguishes proposed feedback from proven feedback. Based on the examination of the models, it can be concluded that feedback processes are more effective if feedback is:

- immediate, positive, and corrective in such a way that learners are guided to provide the right answer (extracted from behaviourism)

- focused on the task, specific, detailed, clear, corrective in such a way that learners are guided to give the right answer, and helping learners to close the gap between their actual and the desired performance (extracted from cognitivism)
- accurate, concrete, specific, focused on the task and/or goal, descriptive, frequently, and creating cognitive dissonance (extracted from social cultural theory)
- helping to become familiar with the gap between an actual and desired performance and to close the gap, descriptive, specific, timely, relevant, useful, sufficient, explorative, supportive, and respectful (extracted from meta cognitivism)
- task and/or goal-directed, focused on the learning process, specific, in time and frequent, neutral, unbiased, non judging, and encouraging dialogue (extracted from social constructivism)
- ongoing, mutual, timely, based on actual data, non subjective, non summative, and clear and concise directions for future change (extracted from cognitive apprenticeship method).

Some general rules of thumb were found; however, some guidelines are established that origin in only one learning theory. For instance, only from behaviourism, feedback should be timed immediately. This finding might be explained as follows. Behaviourism is the only learning theory that focuses on changing behaviour; others address the development of knowledge. This may have led to the established guidelines for timing and might explain the mixed results that are reported in feedback research (see for instance Mory, 2003 on timing of feedback).

Despite the general conclusions and rules of thumb, findings also show that different and sometimes contrasting characteristics of feedback are considered effective within one perspective. For instance, in behaviourism, Goodman et al. (2008) suggested that telling somebody what to do leads to the desired outcomes. On the other hand, Ferreira et al. (2007) concluded that supporting and evoking somebody to provide the right answer is more effective than telling them what to do. As a consequence, not all contrasting empirical findings can be explained by learning theory.

In this review, we have used learning theories as a way to determine what effective feedback among teachers is. The six learning theories provide a chronological perspective of the development of concepts of learning. We do not aim to determine which learning theory is 'better' than the others. We believe that teachers and researchers should become aware of the differences between the learning theories and choose the appropriate feedback mechanism for what they intend to learn their students and consequently implement a certain research context or teaching behaviours.

This chapter shows that feedback processes are complicated. Guidelines for giving effective feedback depend on many aspects: the learners, the tasks at hand, the

providers, the feedback message, the context in which feedback is given, and the interaction between these aspects.

2.4.1 Limitations

There are some limitations to this chapter. First, while some authors explicitly mentioned their learning perspectives, others were less clear from which learning theory they reasoned. In addition, some articles combined two learning theory perspectives and were assigned to both learning theories. Second, the learning theories themselves differ in clarity. The learning processes in behaviourism are obvious; however, learning processes in social constructivism and cognitive apprenticeship method are much more complicated. Consequently, few articles examined the feedback process as a whole. Finally, some characteristics of feedback lacked clear descriptions in the articles. These limitations influence the comparison of the studies' findings and the established guidelines.

2.4.2 Practical implications

A first practical implication for the professional development of teachers is that mentoring and peer coaching programs need to be implemented in schools. These kinds of programs are expected to reinforce the quality of teachers. Second, when teachers are given feedback, irrespective of whether this occurs in mentoring or peer coaching programs, feedback should be specific, clear, and unbiased. In addition, teachers should have the opportunity to engage in dialogue and should be respected and supported. The feedback should support them to further improve their learning processes and feedback should be given frequently. Third, teachers could benefit from these kinds of experiences and use these guidelines in their classrooms when giving feedback to their students. As such, the students can benefit from effective feedback that supports them to achieve better learning outcomes.

The initial aim of this chapter was to unravel indicators of effective feedback among teachers, which can be used to develop an observational instrument. The findings of this chapter suggest that several implications need to be taken into account. First, we intend to observe feedback in a context of learning from experiences, which aligns with social constructivism and cognitive apprenticeship method. However, the indicators for effective feedback among teachers in these two learning theories only suggested giving this feedback in a context of mentoring and peer coaching. No clear recommendations about characteristics of effective feedback among teachers were given. So to operationalize effective feedback, we need to rely on research on feedback to students. Second, several indicators are not observable, such as the characteristic 'sufficient' and the rules of thumb. Because we want to develop an observational instrument, choices need to be made about which indica-

tors can be operationalized into observable indicators. Third, feedback is a complex process and we want to acknowledge this complexity. So, the observational instrument needs to be able to capture this complexity and the empirical studies are conducted in naturalistic settings.

2.4.3 Future research

Within the context of our initial aim for this review, a major limitation in research on feedback between teachers is that no reviewed study investigated actual feedback processes between teachers by means of observations. This is a major challenge for future research. This dissertation takes up this challenge. In addition, in order to observe the feedback processes, an observational instrument has to be developed (see Chapter 4; Section 4.1.3), since such an instrument was not found in the reviewed articles.

The indicators regarding both research questions and the four rules of thumb (see Section 2.4) are used in Chapter 4 to operationalize feedback into six dimensions: (a) goal-directedness vs. non-goal-directedness, (b) specific vs. general, (c) detailed vs. non-detailed, (d) positive vs. negative, (e) corrective vs. non-corrective, and (f) immediate vs. delayed (see Section 4.1.1). These dimensions are the basis for the observational instrument that is used in the empirical studies (Chapters 4, 5, and 6).

In our forthcoming empirical studies, we adopt Licklider's (1995) and Landry et al.'s (2009) suggestions. These studies are conducted in peer coaching settings, in which teachers are of equal status, which connects to social constructivism and cognitive apprenticeship method. The feedback between teachers that we explore is given within the context of a peer coaching program, namely the Video Intervention Peer coaching procedure (VIP; Jeninga, 2003; see Section 1.4 for a detailed description of the program).

Feedback processes are complicated and many aspects interact with each other. Future research should acknowledge this complexity and try to comprehend it. In addition, researchers should be aware of learning theories and use these explicitly as a starting point for their studies and publications.

The development of our observational instrument is addressed in Chapter 4. First, Chapter 3 describes an explorative study in which a group of teachers participated. They applied the Video Intervention Peer coaching (VIP) procedure in an asynchronous environment. The online coaching processes were examined and the teachers were interviewed about their experiences with the online VIP procedure.

Chapter 3

Video Intervision Peer coaching in teacher professionalization: First online explorations

This chapter is based upon:

Thurlings, M., Kreijns, C., Bastiaens, T. J., & Stijnen, P. (2009). Video Intervision Peer coaching in teacher professionalization: First online explorations. IN: C. Maddux (Ed.). *Research highlights in information technology and teacher education 2009* (pp. 319–327). Chesapeake, VA: Society for information technology and teacher education (SITE).

3.1 INTRODUCTION

With the introduction of the Dutch law Professions in Education in 2006, teachers in the Netherlands are supposed to continuously develop themselves in their profession. Professional development can occur by formal education as well as in more informal ways, as long as there is a growth which is well for the profession. As such, professional development can take place in many different ways, from following traditional training to participating in a learning network. Professional development is also known as workplace learning (e.g., Billett, 2002). According to workplace learning theory, learning does not take place outside the workplace, but rather during the work itself. Consequently, learning is viewed as informal. Learning from and with colleagues at the workplace is growingly identified as more effective than for instance formal education (e.g., Billett, 2002; Meirink, Meijer, Verloop, & Bergen, 2006; Van Veen, Zwart, Meirink, & Verloop, 2010).

One approach of learning from and with colleagues is peer coaching. Peer coaching was introduced approximately 25 years ago by Showers and Joyce as a method for professional development in schools (1996). Ever since, many authors have developed methods for peer coaching (e.g., Licklider, 1995; McAllister & Neubert, 1995). A more recent method for peer coaching is the Video Intervention Peer coaching procedure (VIP; Jeninga, 2003; see also Section 1.4), with which teachers can improve their self-selected teaching behaviours in their classrooms.

3.1.1 Research questions

The study here presented is exploratory. The study focuses on a first experience with the VIP procedure applied in an online asynchronous environment. One group of teachers participated voluntary for six months, however, the interaction between them ended after about three months. In this chapter, we address the following research questions:

1. Which characteristics did the coaching process have during the online pilot?
2. How did the online pilot develop and why developed it as it did?

This chapter is outlined as follows. First, the VIP procedure (Section 3.2), its underlying pillars (Section 3.2.1), and reasons for the online application (Section 3.2.2) are described. Then, the methods for this pilot study are addressed (Section 3.3). Third, the results are presented (Section 3.4). Finally, we discuss the results and portray several important lessons learned (Section 3.5).

3.2 VIP PROCEDURE

The Video Intersession Peer coaching procedure (VIP) aims at the improvement of teacher classroom behaviour and at the development of an appropriate coaching attitude (Jeninga, 2003). Groups are formed, consisting of three or four teachers, who coach one another. The process of the VIP procedure has four main cyclic states and in order to facilitate this cyclic workflow, teachers fill out an Action Improvement Plan (AIP; Jeninga, 2003). In the online environment, participants have their own wiki, which is set up as the AIP.

The workflow starts in the *preparation* state. In this state, teachers select a teaching behaviour that they wish to improve. They have to videotape the problematic behaviour so that the video excerpts can be used as input for constructive online discussion. The teachers upload the video excerpt. In their AIP, or in other words, the wiki, they present an initial setup of the improvement goals (e.g., becoming more consistent in applying classroom rules) along with a strategy how to achieve these goals. Such a strategy will roughly describe the steps or phases and actions teachers believe they have to implement.

The second state of the workflow is the *peer coaching* state, in which the peer coaches coach the coached teacher. As each teacher in a group has his own wiki, the peer coaching becomes reciprocal. The peer coaching takes place within the wikis. The emphasis in the discussions is not on a heavy weighted highly structured reflection process for analyzing what exactly has happened and why, but on a solution-focused thinking process that uses a light weighted low structured reflection process, that is supported by open-ended questions from the peer coaches. The underlying assumption is that teachers tacitly know what is wrong in their behaviour when they view the video excerpt (Jeninga, 2003). Based on the discussion, a refined setup of goals, strategy, and actions is formulated and written down in the AIP.

Third, following the suggestions in the AIP, teachers perform an altered behaviour, which they, once again, have to videotape for evaluation. In addition to the videotaping, teachers have to comment on and evaluate their altered behaviour and write this down in their AIP. The evaluation is expressed in terms of satisfaction with the altered behaviour.

Subsequently, the *peer coaching* state is re-entered. The uploaded video excerpt illustrating the altered behaviour is discussed and so are the comments and the evaluations in the AIPs of the coached teachers. The peer coaches give feedback and the coached teachers have to give a final evaluation. Teachers who improved their behaviour (positive evaluation of the altered behaviour) close their AIP and may bring in their next problematic behaviour, thereby opening a new wiki and thus a new AIP. Teachers who did not improve their behaviour (negative evaluation of the altered behaviour) receive additional suggestions such as redefining the goal or

by formulating other strategies and actions. This whole process is repeated again and again until they have succeeded in reaching their goal.

3.2.1 VIP's pillars

The VIP procedure has five underlying pillars: video, intervision, peer coaching, solution-focused thinking, and the role of the process supervisor. During the past decades, the use of *video* in training programs for pre-service and in-service teachers has increased enormously. The video's potential for bridging the gap between theory and practice and the rapid improvement of technology explain this growth. Particularly, the new technology makes digital video and non-linear editing of the digital data on a simple desktop computer possible at low costs (Brophy, 2004). A common use of video in education is to show a model of good teacher behaviour (Sherin, 2004). Another way of using video is field recordings of student teachers. They are videotaped in order to give them feedback on their performance (Sherin, 2004). Despite the increased use of video, little research has been conducted on the effectiveness of the use of video in teacher education. A study by Sherin and Han (2004) did show that discussions in video clubs — these are meetings in which in-service teachers discuss video excerpts of their classrooms — change over time in topic and in the way the topics are discussed. Brophy (2004) concluded from several studies that video has a permanent value as a tool in teacher education. He suggested that it is important to build learning communities in which the videos can be viewed and discussed in a safe environment. Brophy (2004) also stressed that the emphasis should be on finding alternatives instead of judging, which he considered as a pitfall.

The second pillar is *intervision*. In the VIP procedure, intervision is described as giving suggestions and brainstorming about possible solutions for a problem. This contrasts the commonly agreed definition of intervision, which is teachers learning from and with one another in a small group (Visser, 2004). Moreover, intervision in the VIP procedure comes after peer coaching and solution-focused thinking. Only if coached teachers cannot find their own solutions, the peer coaches and process supervisors can use intervision.

The third pillar is *peer coaching*. Peer coaching is a process in which two or more teachers work together to reflect on their teaching practice in order to solve problems that they experience in their teaching practice (Robbins, 1991). Showers and Joyce (1996) showed that teachers participating in peer coaching teams are more willing to accept and implement changes in teaching strategies and curricula than teachers who participated in training programs. Furthermore, peer coaching appeared to affect not only teachers' skills and knowledge, but also the development of the school as a whole (Showers, 1985).

The VIP procedure is a *solution-focused thinking* method (Jeninga, 2003). Solution-focused thinking refers to looking forward in order to solve a practical on-the-job problem that teachers experience (Jackson & McKergow, 2002). Solution-focused thinking deals with what a teacher can change. An underlying assumption is that small steps make a difference. Solution-focused thinking differs from reflection, in which a problem is discussed into detail before a solution is found (Jackson & McKergow, 2002). An example of solution-focused thinking is the following question: "If we would visit your classroom tomorrow, what would we see which is different from what we see in the video excerpt?"

In order to allow the VIP procedure to function, the presence of a *process supervisor* is necessary (Jeninga, 2003). The most important role process supervisors have is modelling good coaching behaviour. Good coaching behaviour in the VIP procedure is seen as using solution-focusing thinking, or to be more precise, asking open-ended questions which helps the coached teachers formulating their goals, strategies, and actions more specifically (Jeninga, 2003). In addition, giving coached teachers feedback, instead of judging (see also Brophy, 2004), is considered appropriate. Furthermore, process supervisors can take a meta-perspective on the coaching behaviour of the peer coaches in order to reflect on this behaviour, either confirming or disconfirming. It is believed that by taking this meta-perspective, the peer coaches will develop coaching skills and coaching attitude.

Literature suggests that there are several factors, which either enhance or limit the success of peer coaching. The success of peer coaching depends on having time (Jeninga, 2003; Showers, 1985; Swafford, 1998), trust between the participants (Swafford, 1998; Wong & Nicotera, 2003), coaching skills of the participants (Swafford, 1998), and the preparedness of the participants (Bowman & McCormick, 2000; Wong & Nicotera, 2003). First, the participants in peer coaching should be given time for the meetings and for the activities they have to implement in order to prepare the meeting, for instance, selecting video excerpts. Second, the participants should trust each other. In other words, the atmosphere in the coaching group should be respectful, confidential, and collegial (cf. Brophy, 2004). Third, the participants should have the necessary coaching skills. Finally, the participants have to be well prepared to participate in peer coaching.

3.2.2 Online VIP procedure

This study presents a first exploration of the online VIP procedure in which a group of teachers was studied while they were using the online learning environment Moodle. There are several reasons to experiment with an online environment in this dissertation. First of all, there are technical advantages like the direct usage at the workplace (videotape the situation) and the easy exchange over the Internet with others. Secondly, there is the advantage that technology makes the peer coaches

and coached teacher not dependent anymore on a particular time and place. One can, for example, watch the video and give advice in Moodle whenever it is convenient. Thirdly, the Internet makes it also easier to find external people who can serve as a coach. Discussing problematic behaviour with colleagues at the same institute makes coaching much more threatening. For that reason an external coach is often preferred above a known person. Finally, we expect participants to share information, experiences, and knowledge and serve as a *Community of Practice*. According to Wenger and Snyder (2000), people in *Communities of Practice* share their knowledge and expertise in such ways that they find new approaches to problems.

In order to succeed in online courses, Duff and Quinn (2006) argued that students should have a realistic view of the course, have the necessary technical skills, and be committed to and motivated for the course. Furthermore, interaction should be consistent and structured because this enhances the relationship between the communicators (Morgan, 2006; Walther & Tidwell, 1995). In the online VIP procedure this means that the participants should have or acquire the requested technical skills, such as uploading video excerpts. They also should be motivated for and committed to the online peer coaching. Furthermore, the participants should know what they are supposed to be doing while peer coaching. Regarding the VIP procedure, this means that they should know what good coaching behaviour is (i.e., using solution-focused thinking and giving feedback) and apply these skills and attitude. Finally, they should interact at a consistent and structured pace in order to build a relationship between them.

3.3 METHODS

3.3.1 Participants

Three teachers volunteered as participants in the pilot (one male and two female). They had previous experience with the VIP procedure in face-to-face settings at their schools. Fictitious names are used to protect their privacy. Mark and Sara teach at two different vocational schools in the south of the Netherlands and Helen teaches at a secondary vocational school in Flanders, Belgium. Table 3.1 lists demographic data of the participants.

Four facilitators were involved (three male and one female). They were experienced in guiding teachers in the face-to-face VIP procedure. Their job was to organize a face-to-face introduction meeting and to provide an example of an AIP in the online environment Moodle. One of the facilitators acted as a process supervisor; however, he did not interfere within the wikis, but communicated via e-mail and phone with the teachers. All participants and facilitators were native Dutch speakers.

Table 3.1 Demographic data of the participants

Name (fictitious)	Age	Years of teaching experience	Age of participant's students
Mark	28	5	15 to 16
Helen	31	10	17 to 19
Sara	47	12	12 to 14

3.3.2 Instruments

In order to address the first research question, the wikis containing the participants' AIP were analysed. Section 3.3.4.1 provides a more detailed description on how the wikis were analysed.

In order to address the second research question, the participants were interviewed. The interviews were semi-structured and consisted of seven main categories of questions. The categories were:

1. general impressions;
2. opinions about a number of characteristics of the online VIP procedure;
3. experiences with enhancing factors for both peer coaching and online setting;
4. experiences with limiting factors for both peer coaching and online setting;
5. suggestions for improvement;
6. perceived outcomes, for instance learning effects;
7. opinions about the reasons for the abrupt end of the pilot.

3.3.3 Procedure

The pilot started in September 2006, with a face-to-face introduction meeting in which participants could meet and get to know each other. During the meeting, a hands-on course on Moodle was given. The intention of the pilot was to last for about six months, but the pilot stopped prematurely after three months. Each of the participants was interviewed after the pilot. Mark and Sara were interviewed face-to-face, while Helen was interviewed over the phone.

3.3.4 Data analysis

3.3.4.1 Observations

The content of the AIPs is analyzed both qualitatively and quantitatively and is compared with the objectives of the VIP procedure. Therefore, the data analysis of the

AIPs focused on the number and distribution of open-ended and closed questions and on the kind of feedback given by peer coaches.

The VIP procedure expects peer coaches to ask open-ended questions (e.g., “why”-questions) to encourage coached teachers to think about their goals, strategies, and actions. Contrastingly, evocative questions (e.g., “Why don’t you ... ?” or “If I were you ...”) are seen as non-appropriate, because solution-focused thinking does not suppose that suggestions are given. Closed questions, which are answered only by a “yes” or “no”, or a very short answer should not outnumber the open-ended questions.

Feedback can be given in a positive, negative, and constructive way (see Chapter 2). Positive feedback holds a confirmation of someone’s actions or behaviour. Negative feedback is the disapproval of someone’s behaviour. Constructive feedback is focused on improvement and concretely defined (Visser, 2004). It was determined what kind of feedback was given by the coach, and on whose behaviour — teacher or pupil(s) — the feedback focused.

3.3.4.2 Interviews

The transcripts of the note taking were e-mailed to the participants for a check because the interviews were not audio taped. Statements of the participants on the eight factors enhancing or limiting the success of online peer coaching (see Sections 3.2.1 and 3.2.2) were expressed in either plusses or minuses: When a participant expressed negativity about a factor, this was expressed in one or two minuses. When a participant expressed positivity about a factor, this was expressed in one or two plusses. When the answer was ambiguous, this was expressed in both a minus and a plus (Miles & Huberman, 1994). This same method was used for participants’ experiences with several characteristics of the online VIP procedure.

3.4 RESULTS

3.4.1 Observations

3.4.1.1 Examples of appropriate coaching behaviour

A first example of appropriate coaching behaviour is found in Helen’s first AIP. She described the context of her problem and defined her goal. Subsequently, Mark and Sara responded by asking several questions. Helen reacted to both Mark and Sara, first by answering their questions and then by refining her goal. A second example of appropriate coaching behaviour is the specific description of strategies Mark wrote down in his first AIP. It elaborated exactly what he wanted to do. He also

described the situations in which his plans might not work and how he would act in those cases, for instance, “It could happen that there is a queue [of students] at my desk. Then the students might start to annoy each other. So, I’ll make sure there are no more than two students at my desk”.

3.4.1.2 *Examples of non appropriate coaching behaviour*

A first example of non appropriate coaching behaviour is found in Sara’s first AIP. Sara did not write specific actions regarding the involvement of her students at the start of the lesson as she believed that “preparing some questions should be enough”. A second example is Sara’s reaction to Mark’s well thought-through plan in his first AIP. She wrote, rather judgmentally “I don’t think it is bothering the students if a teacher walks through the classroom and occasionally assists a student”.

3.4.1.3 *Misunderstanding and clarifying*

In Helen’s first AIP a misunderstanding arose and was clarified. Mark wrote in reaction to Helen’s goal (i.e., to not let herself be distracted by her students when she has planned a certain lesson): “I do not understand what the problem is ...” This might be due to cultural diversity, as in Belgium complete silence in the classroom is rather normal, whilst in the Netherlands a few chatting students would be accepted. Helen reacted by elaborating the context of her ideas and she made a comment which indeed is focused on the different school climates: “The students indeed are silent, but that is probably due to our (different) school climate”. In Sara’s first AIP another misunderstanding and clarifying cycle can be found. After Sara’s own feedback, Mark asked for clarity: “What do you want with the evaluation? Do you mean evaluating the lesson with your students, or do we have to evaluate the lesson?” Sara thanked Mark for his reaction and then answered Mark’s last question: “I could engage the students in the lesson by evaluating the last lesson by asking questions. [...]. If I start each lesson with an evaluation, I do not need to end each lesson with a summary. Do you understand?” Mark reacted: “I understand ...”

3.4.1.4 *Quantitative analysis of the AIPs*

Table 3.2 shows the number of questions asked and feedback given within the AIPs. In total, 47 questions were asked within the AIPs, of which 34% were open-ended questions. 51% were closed questions and 15% were evocative questions. Sara asked the most open-ended questions, followed by Mark and Helen. Helen and Sara together asked 83% of all closed questions. Sara alone asked half of the evocative questions. She also asked the most questions of all: 47% of all questions asked came from Sara. Helen asked 32% of all questions and Mark asked 21% of all questions.

So, even though Mark asked the least number of questions, he followed the intention of asking questions in the VIP procedure best.

Table 3.2 also shows that most feedback was positive. Especially Mark gave much positive feedback. Sara's only feedback was positive and focused on the pupils' behaviour. Helen wrote down one piece of negative feedback, which was focused on her own students: "The students are a bit too enthusiastic, which results in too much noise". Both Helen and Mark wrote constructive feedback in the evaluation part of their own AIPs. An example of constructive feedback in Mark's evaluation in his first AIP is as follows: "I would like to have students, who are capable of explaining well and clear, assisting their classmates".

Within the VIP procedure, feedback should be directed at the behaviour of the teacher, and thus should not be focused on behaviour of student(s), since the intention of the VIP procedure is to improve teachers' behaviour. Table 3.2 shows that slightly more feedback, both in total and per participant, was focused on the behaviour of pupil(s) than on that of the teacher.

Table 3.2 The number of questions asked and feedback given by each participant and in total within all AIPs

	Helen	Mark	Sara	Total
<i>Questions</i>				
Open	2	5	9	16 (34%)
Closed	11	4	9	24 (51%)
Evocative	2	1	4	7 (15%)
Total	15	10	22	47 (100%)
<i>Kind of feedback</i>				
Positive	3	9	1	13 (68%)
Negative	1	0	0	1 (5%)
Constructive	3	2	0	5 (27%)
Total	7	11	1	19 (100%)
<i>Focus of feedback content</i>				
Focused on teacher's behaviour	3	5	0	8
Focused on students' behaviour	4	6	1	11

3.4.2 Interviews

The participants answered differently to the question for describing the VIP procedure in their own words. Helen believed that the AIP is the same as the VIP procedure. Mark remembered that the VIP procedure is an abbreviation but did not recall which words the individual characters VIP stand for. Sara could not describe the VIP procedure and she wondered whether one needs to have videos for online peer

coaching: “When you have been a teacher for a long time, you know what somebody wants to say when you read his/her description”.

Table 3.3 summarizes the experiences of the participants with several characteristics of the online VIP procedure. Helen thought the electronic environment to be well organized, whilst Mark said it was unorganized. Sara just did not like to communicate online. All participants agreed that the four facilitators did a good job. Taping, cutting, and uploading of the video excerpts were experienced as difficult. Helen and Sara liked the AIP; however, Mark thought the AIP is too long. Finally, all participants liked the introduction meeting, because they were able to meet and to get to know each other. Therefore, an introduction meeting is necessary, according to Helen and Mark.

Table 3.3 Experiences with characteristics of the online VIP procedure

	Helen	Mark	Sara
Electronic environment	+	-	-
Facilitators	+	+	+
Video	+	++	--
AIP	+	-	+
Introduction meeting	+	+	+

Note. When a participant expressed negativity about a factor, this was expressed in one or two minuses. When a participant expressed positivity about a factor, this was expressed in one or two plusses. When the answer was ambiguous, this was expressed in both a minus and a plus (Miles & Huberman, 1994)

Table 3.4 summarizes the experiences with the enhancing and limiting factors. Each of the factors is now discussed.

Table 3.4 Experiences with enhancing and limiting factors

	Helen	Mark	Sara
Time	++	+-	--
Trust/Bonding	+-	+-	+-
Being prepared	+	+	+-
Coaching skills	+	+	+
Technical skills	+	+	--
Realistic view	-	-	+-
Motivation	+	+-	-
Continuous and structure in interaction	--	--	-

Note. When a participant expressed negativity about a factor, this was expressed in one or two minuses. When a participant expressed positivity about a factor, this was expressed in one or two plusses. When the answer was ambiguous, this was expressed in both a minus and a plus (Miles & Huberman, 1994)

Time Results showed that Helen took the time to participate. She logged in every other day. Sara and Mark pointed out, that they did not have enough time for dif-

ferent reasons. When asked what the main reason was for the abrupt end of the pilot, all participants reported time problems; as Mark put it: “giving priority to other things ... or I guess I should say more important things”.

Trust All participants agreed that they trusted each other. Mark told that Helen’s adequate way of reacting established trust. He also told that Sara’s inadequate way of reacting did not establish trust. Fair enough, he immediately admitted that his way of reacting was not adequately either. However, there was no real bonding between them, agreed the participants.

Preparedness According to the participants, their previous experiences with the VIP procedure made them well prepared. Sara, however, expressed that she did not feel prepared on her technical skills. Moreover, this feeling and because Sara thought communication in an electronic environment fails to convey emotions, Sara reported during her interview that she doubted whether she should have participated. She said: “Actually, I should have said ‘no’” [to participate in the pilot].

Coaching skills Because of their experience as coaches and because of their experience using the VIP procedure in face-to-face settings, the participants argued their coaching skills were of good quality. Though, as Table 3.2 and the previous examples (Sections 3.4.1.2 and 3.4.1.3) showed, the coaching behaviour of the participants was not always in alignment with what was demanded.

Technical skills Helen and Mark reported that the electronic environment was easy to handle. Mark expressed that he liked making a nice video excerpt, and therefore, he was willing to put a lot of effort in making them. Sara articulated that she was not used to communicate by computers: “the computer is not the medium for me to communicate”. She also admitted that she did not do her best to learn how to upload video excerpts and that she had to rely on others in order to accomplish this.

Realistic view Only Sara expressed that she had a realistic view: “I knew it was a pilot, and because of that, things may go wrong”. Helen reported she had had higher expectations and Mark told he had hoped participating would have been easier.

Motivation Helen was the most motivated participant. Mark was motivated, but probably for the wrong reason: he just wanted to help one of the facilitators. Because of the few reactions given by the two other participants in the AIPs, Helen’s motivation decreased.

Continuous and structure of the interaction The interaction was not continuous, and therefore the participants could not give each other timely feedback (e.g., Black & Wiliam, 1998a; see also Section 2.3.1.3). Peer coaches did not always react on the coached teacher’s contributions in the AIPs. And if they did, the coached teacher hardly ever reacted. In fact, this was only once the case. The interviews also threw a light on this matter. Helen reported that she tried to react the next day after she had read a contribution. But because Mark and Sara did not consequently post

messages, Helen gradually logged in less than she did before. After about a month, Helen logged in about once a week, whilst Mark had found time to participate and thus logged in more frequently. But, as Helen did not log in so often anymore and, probably because Sara did not either, the interaction came to an end.

None of the participants reported during the interviews that they learned from the peer coaching activities they used in the pilot. Helen said that gaining knowledge of the Dutch school system is an outcome for her. Sara reported that she learned to handle an electronic environment. Mark ironically said that he learned how to use Moviemaker: "That is probably all I learned". A quote of Mark seems to summarize the process: "... watching a video and coaching. That last bit is difficult, because when you ask a question, you have got to wait for an answer. When the answer finally comes, you hardly remember why you asked that specific question in the first place".

Finally, during the interviews, the participants expressed that they preferred face-to-face peer coaching to online peer coaching. Sara thought that the subject a teacher teaches and the age of the participants can make a difference in achieving successful online peer coaching. An argument that Sara gave in favour of online peer coaching is that the impersonality of an online environment could be secure. In her opinion, there are many teachers who are embarrassed to admit to their colleagues that they cannot handle a certain class. Therefore, these teachers would be able to talk about how to handle difficult classes within a safe, anonymous environment. Helen said that although she preferred face-to-face peer coaching, online peer coaching does not have to be rejected: "Independence of time and place is the trump card".

3.5 CONCLUSION AND DISCUSSION

In this chapter an explorative study is described, which was conducted in order to evaluate an online pilot of Video Intivision Peer coaching procedure (VIP; Jeninga, 2003). The fact that there were three participants means the amount of data is limited. Consequently, it is impossible to draw any conclusion on the online VIP procedure and how it compares to face-to-face the VIP procedure, yet, a comparison of face-to-face versus online VIP procedure is made in the study described in Chapter 4.

The early end of the pilot can be explained from a number of factors that are known from literature. The lack of continuous and structured interaction was mainly caused by the factors (a) time, (b) decreasing motivation and commitment, (c) low technical skills, and (d) lack of fully understanding the concept of the VIP procedure (see also Bowman & McCormick, 2000; Duff & Quinn, 2006; Jeninga, 2003; Morgan,

2006; Showers, 1985; Swafford, 1998; Walther & Tidwell, 1995; Wong & Nicotera, 2003). A similar finding is uncovered by Yang and Liu (2004). In their study, Taiwanese teachers participated in an online workshop directed at mathematic teaching. These teachers were compelled to post a message once a week, which they did. However, hardly any interaction took place. This lack of interaction was caused by a lack of time, the need to complete too many other assignments, the need for more clues in the messages to react to it, and too few experiences matched their own (Yang & Liu, 2004).

Explanations for these results can be found in three concepts: social presence, the Self-Determination Theory, and the Prisoner's Dilemma. First, Kreijns, Kirschner, and Vermeulen (submitted) suggested that social interaction influences social presence and vice versa. Social presence concerns feelings of the other persons' presence, more specifically, that the others are 'real' and lifelike in the online communication. Social presence was not addressed in the interviews, however, each participant indicated that it took quite a long time before the others reacted and, because of this, that the coaching processes did not really start up or got going. Seemingly, the lack of interaction would have led to lower feelings of social presence or the lower feelings of social presence led to fewer interactions.

Ryan and Deci's (2000) Self-Determination Theory provides a second explanation. This theory suggests that people have three psychological basic needs: (a) feeling of competence, (b) feeling of autonomy, and (c) feeling of relatedness. These needs "appear to be essential for facilitating optimal functioning of the natural propensities for growth and integration, as well as for constructive social development and personal well-being" (p. 68). If one of three needs is not fulfilled, people are less likely to be intrinsically motivated. Regarding the need for feeling competent, Sara, for example, did not feel competent in the required technical skills. Regarding the need for relatedness, Mark, for example, felt more related to the facilitators than to his peers, especially to the process supervisor. Furthermore, there was no real bonding between the participants. Regarding the need for autonomy, it is not clear if the participants felt restricted by the guidelines of the VIP procedure or that they indeed could act autonomously within these guidelines.

The final explanation for our results may be found in the Prisoner's Dilemma (Axelrod & Hamilton, 1981), which explains why spontaneous collaboration can cultivate. The Prisoner's Dilemma illustrates that one does not help another person, if one does not know whether the other person will help you in another occasion, paying of his guilt. The best strategy for dealing with the Prisoner's Dilemma is tit-for-tat, which means that in the first try one collaborates or invests and then, during each single next try, imitates the opponent's behaviour during the previous try. The tit-for-tat strategy has three prerequisites, which all should be met (Axelrod & Hamilton, 1981; Sloep, 2008). First, there should be no known end, which was the case during our pilot. Second, the players should know one another, which was debat-

able during this pilot. The participants had met once and argued that they trusted each other in a professional way, but there was no real bonding. Third, future meetings should be similar to the previous. In our pilot, the participants did not actually meet; however, the VIP procedure has a certain known cycle with steps that can be compared to one another. In addition, the participants of our pilot will probably never meet again, and therefore, investments left after guilt will not have to be paid back. To sum up, Helen started to invest, making the first appropriate step of the tit-for-tat strategy. However, the two other participants did not do so, and Helen changed her behaviour in accordance with Mark and Sara, playing along with the tit-for-tat strategy. Later on, Mark started to invest, but did not receive an exchange, since Helen was already copying his behaviour. Sara actually did not invest at all. So, investing in one another came to an end and so did the pilot.

3.5.1 Lessons learned

From our results several lessons learned or implications can be formulated:

- Participants should fully understand the concept of the VIP procedure and, consequently, know how they have to behave as a coached teacher and as a peer coach. Moreover, they should know what kinds of feedback are effective (see Chapters 4, 5, and 6).
- Participants should acquire the required level of coaching skills and attitudes. These coaching skills and attitudes are (a) encouraging coached teacher's reflection, (b) giving compliments, (c) using conversation skills, (d) encouraging the formulation of concrete goals and actions, and (e) encouraging the coached teacher's insight by asking questions on the consequences of certain behaviour, asking on the feasibility of certain made choices, and pointing at making small steps (cf. Jackson & McKergow, 2002).
- Participants should develop an appropriate coached teacher attitude. This attitude encompasses the following: (a) willing to be coached, (b) willing to learn, (c) willing to change, (d) willing to get to know oneself better, (e) willing to take responsibility for their own learning, and (f) trusting their peer coaches (see also Swafford, 1998; Wong & Nicotera, 2003).
- Participants should acquire the required level of technical skills. For example, they should learn how to use Moviemaker to edit the video excerpts.
- Participants should be trained to obtain the required online communication skills. For example, they should be made aware that non verbal cues cannot be transmitted by text-based e-mail and discussion groups and that, therefore, messages can become ambiguous and uncertain (Daft, Lengel, & Trevino, 1987).
- School leaders should provide the necessary facilities to teachers who wish to improve their teaching. For example, time should be allocated to these teachers (cf. Swafford, 1998).

- Participants should be made aware that online peer coaching takes time and that they should take the time to peer coach online. In addition, it might be necessary to make agreements on the time span for reacting on another person's contribution.
- The interaction should be continuous, structured, and not be broken by periods of 'silence', in order to support the relationship between the communicators (Morgan, 2006; Walther & Tidwell, 1995). In addition, Ryan and Scott (2008) found that increasing the role of the instructor in an online environment amplifies the possibilities for pre-service teachers to learn in an online environment. Consequently, in the online VIP procedure, the role of the supervisor has to increase.
- Participants should be made aware of the Prisoner's Dilemma and the tit-for-tat strategy, which is best for a successful online collaboration. This might overcome the issue of one person feeling as if he is investing everything, while the others do not invest at all.

Based on the first lesson learned (Section 3.5.1), the next study focuses on the interaction between participants in face-to-face VIP procedure, specifically, on feedback that they give each other. In Chapter 4, we combine literature and research on feedback in an observational instrument, that was pilot tested on four coaching conversations (Thurlings, Bastiaens, Stijnen, & Vermeulen, 2009). Preliminary results of this pilot test showed that this observational instrument helps in mapping the interaction between the participants (Thurlings et al., 2009).

Chapter 4

Development of the Teacher Feedback Observation Scheme: Evaluating the quality of feedback in peer groups

This chapter is based upon:

Thurlings, M., Vermeulen, M., Kreijns, C., Bastiaens, T. J., & Stijnen, P. (2012). Development of the Teacher Feedback Observation Scheme: Evaluating the quality of feedback in peer groups. *Journal of Education for Teaching*, 38(2), 193–208
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4.1 INTRODUCTION

Numerous studies indicated that feedback is an important learning tool and an essential element in learning (e.g., Hattie, 2009; Hattie & Timperley, 2007; Shute, 2008). Most studies focused on feedback given to students and its effect on student learning. However, these studies rarely considered feedback among teachers (Scheeler, Ruhl, & McAfee, 2004; see also Chapter 2). This is changing as society is struggling with impending shortages of highly qualified teachers, which has caused growing attention to teacher professional development (OECD, 2002). In 2006, the Dutch Ministry of Education enacted the Law on Professions in Education to address teacher shortages in the Netherlands. This law elaborated on which competencies teachers should possess and how continuous professional development can contribute to these competencies.

The study described in this chapter focuses on feedback that teachers give one another in peer groups as part of their professional development activities, which are oriented towards the improvement of teachers' class performance. The goals of this study are to (a) investigate the feedback process, (b) determine whether the feedback given is effective, and (c) explore which interventions could be implemented if feedback becomes less effective. This approach differs from that of Williams, Shibanuma, Matsuzaki, Kanayama, and Ito's (2008), who developed a feedback cycle for the communication between on-campus and community-based teacher training programmes. Their feedback cycle directed at local networking between organisations, whereas our approach focuses on the feedback among teachers. As such, we accept the challenge which was formulated in Chapter 2. Moreover, our approach differs from most feedback studies, which usually compare one-dimensional differences in feedback characteristics (e.g., immediate vs. delayed, Scheeler & Lee, 2002), in that this study aims to classify feedback processes into effective and ineffective patterns of feedback, thereby approaching feedback as a multi-dimensional process.

To study the process of feedback, it is necessary to have an instrument that can analyse the social interaction during feedback episodes. In particular, the instrument must be capable of identifying patterns of feedback that correspond to certain feedback acts, such as posing questions. The present feedback literature, however, does not report the existence of such an instrument. Therefore, we decided to develop the Teachers Feedback Observation Scheme (TFOS) to meet these needs. By using the TFOS, it becomes possible to accomplish this study's goals.

This chapter begins with an overview of feedback literature, providing insights into characteristics, conditions, and effects of feedback (Section 4.1.1). Informed by these insights, the first part of the TFOS was constructed (Section 4.1.3). To test the potential of the TFOS in peer groups of teachers, a particular method for peer coaching was applied, namely the Video Intervention Peer coaching (VIP) procedure

(Jeninga, 2003; Section 4.1.2; see Section 1.4 for a complete description). The implementation of the VIP procedure influenced the construction of the second part of the TFOS (Section 4.1.3). Before presenting the TFOS, this chapter discusses feedback literature as well as the VIP procedure. Then, the methodology is addressed (Section 4.2). Finally, the results of the pilot testing are presented and discussed (Section 4.3). The results are presented as an illustration on the usability of the TFOS; therefore, only preliminary conclusions can be drawn.

4.1.1 Review of the feedback literature

As was made clear in Section 4.1, research on feedback mainly focused on the learning of students (Hattie, 2009; Hattie & Timperley, 2007; see also Chapter 2). Consequently, definitions of feedback reflect this focus. For example, Hattie and Timperley defined feedback within the context of student learning as “information provided by an agent regarding aspects of one’s performance or understanding” (2007, p. 81). However, if feedback is connected with teachers’ learning through non-instructional professional development activities, feedback between learners can be defined as “information that allows for comparison between an actual and a desired outcome” (Mory, 2003, p. 746). Regardless of the definition used, feedback consists of at least one of the following four elements: (a) data on the actual performance of the learners, (b) data on the standard of the performance, (c) a mechanism for comparing the actual performance and the standard performance, and (d) a mechanism that can be used to close the gap between the actual and standard performance (Black & Wiliam, 1998a). Hattie and Timperley’s definition is based upon the first element, whereas Mory’s combines the first three elements.

The question regarding what effective feedback is, and consequently ineffective feedback, can be answered by synthesizing feedback literature into six dimensions. These dimensions are based upon the rules of thumb and conclusions as described in Chapter 2 (see Section 2.4). First, feedback can be directed at the task or goal (Black & Wiliam, 1998a) or at learners and their characteristics. Task- or goal-directed feedback is more effective than person-directed feedback (Hattie & Timperley, 2007). Second, feedback can be directed at a specific aspect (Mory, 2003) or at a general aspect. Specific feedback is more effective than general feedback and general advice on how to improve one’s actions in the future is effective (Black & Wiliam, 1998b). Third, feedback can be detailed or vague. Feedback that focuses on details is more effective than vague feedback (Scheeler et al., 2004). Fourth, feedback can be corrective (i.e., saying something is wrong and providing a specification of what is wrong and what to do to correct it) or non-corrective (i.e., saying something is wrong without further specification; Scheeler et al., 2004). Corrective feedback is believed to be more effective than non-corrective feedback. Fifth, feedback can be positive or negative. Although some researchers argued that feedback

should be positive (Scheeler et al., 2004), others argued that negative feedback can motivate learners (Schelfhout, Dochy, & Janssens, 2004), and some even argued that feedback is more effective when it is balanced between positive and negative comments (Weaver, 2006). Sixth, the timing of feedback can either be delayed or immediate. Immediate feedback is considered to be more effective than delayed feedback (Mory, 2003).

4.1.2 VIP Procedure

The Video Intervention Peer coaching procedure (VIP; Jeninga, 2003; see Section 1.4 for a detailed description) emphasizes reciprocal feedback in a peer group, that usually consists of three teachers. The VIP procedure defines two roles for the teachers, namely that of the coached teacher and that of the peer coach. Teachers switch between these roles. During each turn, there is one coached teacher, which implies that the other two teachers are peer coaches. By switching roles, each teacher will be the coached teacher once and the peer coach twice.

The VIP procedure can be regarded as a practical realization of the theoretical concept *Visible Learning*. This concept contains six signposts (Hattie, 2009, p. 238–239). Hattie argued that despite *Visible Learning* focuses on student learning, the concept is also applicable to teacher learning. Next, the VIP procedure is described, after which we illustrate how the *Visible Learning* signposts are transferred to teacher learning in the VIP procedure.

The VIP procedure consists of four main cyclic steps (Jeninga, 2003). In the first step, teachers decide which teaching behaviours they want to improve and they videotape this specific teaching behaviour.

In the second step, teachers meet in the first VIP session. Each teacher gets his or her turn as the coached teacher, while the two other teachers are peer coaches. The coached teachers briefly introduce the teaching behaviours that they want to improve and show the associated video excerpt. Subsequently, the peer coaches use solution-focused thinking (Jackson & McKergow, 2002), which supports the coached teachers in proposing a solution to tackle their teaching behaviours. At the end of each teacher's turn, the goals and actions are recorded in an Action Improvement Plan.

In the third step, teachers practice their formulated actions and videotape their altered teaching behaviours again, which are hopefully improved.

In the fourth step, teachers meet in a second VIP session and all teachers get their turn again. The coached teachers elaborate on their altered behaviour and show the newly-made video excerpt. The coached teachers give feedback, after which the peer coaches give their feedback. Next, the coached teachers evaluate their behaviour. The coached teachers give themselves a grade from 1 to 10 that expresses their satisfaction with respect to the extent that they have reached their

goal and they provide some explanation for this. In addition, the coached teachers are asked what they can do to raise this grade (e.g., giving an 8 instead of a 7). The feedback and evaluation are recorded in the Action Improvement Plan. Finally, the coached teachers decide if they are interested in examining another teaching behaviour or in further improving the current teaching behaviour. In the first case, the cycle begins again and, in the latter case, their goals and actions are readdressed, reformulated, or adapted, as if they were in the second step of the VIP procedure. The coached teachers then move to the third step.

Peer groups are guided by a process supervisor, whose task is to facilitate the teachers in the VIP sessions. Process supervisors act as chairmen during the sessions, model coaching behaviours, and reflect on the teachers' coaching behaviours (Jeninga, 2003). The process by which the *Visible Learning* signposts (Hattie, 2009) are transferred to the VIP procedure is shown in Table 4.1.

4.1.3 The Teacher Feedback Observation Scheme

The Teacher Feedback Observation Scheme (TFOS) is developed to analyse the process of giving feedback, given that feedback literature does not report the availability of such an instrument. Based on the dimensions describing the effectiveness of feedback (see Section 4.1.1), the TFOS considers characteristics, conditions, and effects of feedback. Five of the six dimensions that describe effectiveness of feedback are incorporated in the TFOS: (a) goal-directedness vs. person-directedness, (b) specific vs. general, (c) detailed vs. vague, (d) corrective vs. non-corrective, and (e) positive vs. negative. If feedback is goal-directed, specific, detailed, corrective, and balanced between positive and negative comments, then it is more effective than feedback that is person-directed, general, vague, non-corrective, and either too positive or too negative. The dimension of timing was not included in the TFOS for two reasons. First, in face-to-face settings, feedback is always communicated during the VIP session and adequate timing of feedback is difficult to observe. Second, in the virtual setting, it was not possible to detect when messages were posted due to technical issues.

Given the application of the VIP procedure in this study, two additional aspects are included in the TFOS. First, several types of questions are scored. The VIP procedure is based upon solution-focused thinking (Jackson & McKergow, 2002), which assumes that individuals can find their own solutions to their problems. This is facilitated by peer coaches who mainly ask open-ended, solution-focused questions. The peer coaches also facilitate the coached teachers in attaining a clear picture of their goals and concrete actions by asking clarifying questions and through continuous questioning. Therefore, solution-focused thinking emphasizes that judging and evocative questions do not fit into this process. Second, the VIP procedure supports teachers to find solutions to their problems. In other words, teachers are actually

Table 4.1 The transfer of Visible Learning signposts onto the VIP procedure

Hattie's signposts: feedback from teachers to students	The transfer of signposts into VIP procedure: feedback from teachers to teachers
Teachers are among the most powerful influences in learning. Teachers need to be direct, influential, caring, and actively engaged in teaching and learning.	Teachers are placed in the centre of the process. Their own teaching behaviours are discussed as well as how they can improve these behaviours. Teachers decide which teaching behaviours they want to improve and then act upon this. The peer coaches and process supervisor influence and support the coached teacher in their learning process.
Teachers need to be aware of what each student is thinking and knows, to construct meaningful experiences in the light of this knowledge, and have proficient knowledge and understanding of their content to provide meaningful and appropriate feedback, in such a way that each student moves progressively through the curriculum levels.	Teachers consciously engage in their goals and actions, which allows for meaningful experiences. These experiences are videotaped and commented on by coached teachers and peer coaches. Because of the cyclic workflow, the teachers will progressively move through their self-selected goals.
Teachers need to know the learning intentions and success criteria of their lessons, know how well they are attaining these criteria for all students, and know where to go next in light of the gap between students' current knowledge and understanding and the success criteria of 1) 'Where are you going?', 2) 'How are you going?', and 3) 'Where to next?'.	The goal and actions of the teachers are explicitly formulated, addressing the gap that they experience between their current performance and their desired performance. The three questions are addressed in the Action Improvement Plan: The goals of the teachers are formulated. In addition, the Action Improvement Plan guides the teachers during their progress by formulating the actions and evaluating their performance of the actions. During the evaluation, the Action Improvement Plan reinforces the teachers to think about alternative improvement actions that could possibly be better than the current one.
Teachers need to move from a single idea to multiple ideas, and to relate and then extend these ideas, in such a way that learners construct and reconstruct knowledge and ideas. It is not the knowledge or ideas, but the learner's construction of this knowledge and these ideas that is critical.	Constructing knowledge is thinking of alternatives, thinking of criticisms, proposing experimental tests, deriving one object from another, proposing a problem, proposing a solution, and criticizing this solution (Bereiter, 2002). These kinds of knowledge construction are all facilitated in the VIP procedure.
School leaders and teachers need to create school, staffroom, and classroom environments in which error is welcomed as a learning opportunity, discarding incorrect knowledge and understanding is welcomed, and participants can feel safe to learn, re-learn, and explore knowledge and understanding.	The VIP procedure is meant to be a safe environment. It is one of the tasks of the process supervisor to create such an environment.

engaged in problem solving. Peer coaches can give feedback on problem solving by providing hints or tips and asking guiding questions (Smith & Ragan, 1993).

The purpose of the TFOS is to identify feedback patterns. To detect these patterns, White's stages (2009) as well as Miles and Huberman's (1994) suggestions were used. The section data-analysis (Section 4.2.3) provides an explanation as to how this was performed.

4.2 METHOD

4.2.1 Participants

Thirteen teachers (five male, eight female) participated in the pilot study. They were assigned to three face-to-face groups and one virtual group. Table 4.2 shows demographic and other characteristics of the teachers, as well as to which group they were assigned. All teachers were given a fictitious name. The name of each group consisted of the first letters of these fictitious names. Teachers in the face-to-face groups worked at the same secondary school and the teachers in the virtual group were from three different special education schools.

A process supervisor facilitated the face-to-face groups. The process supervisor (male, aged 53) had previous experience in this position, was unfamiliar to the participants at the start of the study, and had no affiliations with the school. Between sessions, he was available to the participants for support and questions.

4.2.2 Procedure

All teachers had a face-to-face introduction meeting so that they could familiarize themselves with the VIP procedure. The face-to-face groups participated in three VIP sessions at their school. These sessions were videotaped, transcribed, and scored using the TFOS.

The virtual group used a Moodle environment that contained discussion wikis. These discussion wikis were formatted according to the structure of the Action Improvement Plan. The content of the discussions wikis was scored according to the TFOS.

Table 4.2 Demographics and other characteristics of the participants

Fictitious name	Gender	Age	Subject	Years of experience	School type	Country
<i>ABC group (face-to-face)</i>						
Ann	Female	39	English	3	Secondary education	NL
Britt	Female	29	Chemistry	4	Secondary education	NL
Chris	Male	23	English	1.5	Secondary education	NL
<i>DEFG group (face-to-face)</i>						
Diana	Female	53	Drama	15	Secondary education	NL
Eric	Male	31	Geography	4	Secondary education	NL
Frank	Male	49	Mathematics	7	Secondary education	NL
Gerald	Male	49	Biology	23	Secondary education	NL
<i>HIJ group (face-to-face)</i>						
Hedwig	Female	32	Philosophy	3.5	Secondary education	NL
Isabella	Female	47	Arts	3.5	Secondary education	NL
Joanna	Female	30	Dutch	2	Secondary education	NL
<i>KLM group (virtual)</i>						
Kate	Female	31	Society education	10	Special education	B
Linda	Female	47	Philosophy	12	Special education	NL
Martin	Male	28	Social skills, Dutch, English	5	Special education	NL

Note. NL = the Netherlands; B = Belgium.

4.2.3 Data-analysis

To investigate the inter-rater reliability of the TFOS, two independent researchers scored one randomly chosen session. Cohen's Kappa was used to determine the inter-rater reliability. Cohen's Kappa expresses to what extent the descriptions of the several dimensions and elements are univocally interpreted (Landis & Koch, 1977). The inter-rater reliability varied between 0.410 and 1.000; averaging 0.756, indicating that scoring using the TFOS is substantially reliable. Table 4.3 provides an

overview of the elements each utterance is scored upon according to the TFOS, their source, and the Cohen's Kappa.

Each session and wiki was scored using the TFOS. The transcripts and wikis of each teacher's turn at being the coached teacher were divided according to White's stages (2009). White developed a quality feedback process model, consisting of three stages: observational stage, analysis stage, and reflective stage. The observational stage "is derived from lecturers observing students while they are teaching on practicum" (2009, p. 128). In the VIP procedure, this stage is addressed in the second and fourth step (see Section 4.1.2), when the peer groups watch and discuss the video excerpt. In the analysis stage, the lecturers coach the students in formulating goals and actions to improve their practices. In the VIP procedure, this stage is mainly addressed in the second step. The reflection stage consists of a debriefing session, in which the lecturers give written and oral feedback to the students regarding the actions that they initiated. The VIP procedure's fourth step is similar to this stage.

The divided transcripts were placed into matrices, combining several matrices to be used in qualitative data-analysis (Miles & Huberman, 1994). By combining White's stages and Miles and Huberman's matrices, several patterns of feedback were discovered.

Table 4.3 An overview of the elements scored in the TFOS based on their source, including the Cohen's kappa between brackets

Based on feedback literature (Section 4.1.1 and Chapter 2)	Based on VIP procedure and solution-focused thinking (Jackson & McKergow, 2002)	Based on VIP procedure: Coaching problem solving (Smith & Ragan, 1993)
Goal- or person-directed (0.619)	Open-ended question (1.000)	Hints/tips (0.496)
Specific or general (0.556)	Closed question (1.000)	Guiding questions (0.843)
Detailed or vague (0.813)	Evocative question (1.000)	
Positive or negative (0.530)	Solution-focused question (1.000)	
Corrective or non-corrective (0.410)	Clarifying question (0.655)	
	Continued questioning (0.655)	
	Judging (1.000)	

4.3 RESULTS

The TFOS detects effective and ineffective feedback patterns. Effective and ineffective feedback patterns are defined based upon the literature review on feedback (Section 4.1.1 and Chapter 2) and in the review of the VIP procedure (Section 4.1.2). Effective feedback is goal-directed, specific, detailed, corrective, and balanced between positive and negative comments. Also, effective feedback includes asking open-ended, solution-focused, and clarifying questions. Ineffective feedback is per-

son-directed, general, vague, non-corrective, and either too positive or too negative. Additionally, ineffective feedback includes hinting, judging, and asking evocative questions.

This section holds three parts. First, effective patterns of feedback are described (Section 4.3.1). Then, ineffective patterns of feedback are discussed, including how these can be turned into effective patterns (Section 4.3.2). Finally, the role of the process supervisor is addressed (Section 4.3.3).

4.3.1 Effective patterns of feedback

In the observation stage, three patterns were discovered. *First*, the peer coaches and process supervisor tended to ask clarifying questions that elicited the coached teachers to elaborate on their video excerpts, in such a way that the coached teachers' feedback became more goal-directed, specific, and detailed. *Second*, if the coached teachers performed their actions well, then the peer coaches and process supervisor would give plentiful positive feedback in the fourth step of the VIP procedure (i.e., discussing the changed behaviour). *Third*, if the coached teachers were in the fourth step of the VIP procedure, before watching the video excerpt, the process supervisor would ask the coached teachers to repeat their goals and actions.

In the analysis stage, three patterns emerged. The *first* pattern emerged in the third session of the DEFG group. Diana (peer coach) provided two hints that might help Gerald (coached teacher). However, both times Gerald explained why these hints were not useful. Then, Diana remained silent during the rest of Gerald's turn. The *second* pattern exemplified how Steve (the process supervisor) guided the coached teachers in formulating their goals and actions, and hinted at what to videotape for the next session. Steve used the coaching technique of 'listening, summarizing, and continuous questioning', by repeating what the coached teachers intended to do and by asking questions like, "What helps you to actually do this?" or "How are you going to remember to implement these actions?" This led the coached teachers to become more goal-directed, specific, and detailed. In the *third* pattern, the coached teachers mentioned a situation that was similar to the behaviour to be improved. The peer coaches and process supervisor then asked questions that led the coached teachers to elaborate on the situation and on what the coached teachers' actions were. These actions were transferred to the recent behaviour. In this pattern, the same coaching techniques as described in the former pattern were implemented. An example of this pattern can be found in the DEFG group's first session. Diana (coached teacher) videotaped a class with many disruptive students. She had troubles with her classroom management. Her peer coaches and Steve then asked her whether she had less disruptive classes in which her class-

room management is better and what she did different in those classes. These actions were then recorded in Diana's Action Improvement Plan.

In the reflection stage, three patterns emerged. In some situations, the coached teachers immediately wanted to initiate a new goal with a new video excerpt. Then, Steve interrupted by asking the coached teachers to reflect on their former goal and to fill in the Action Improvement Plan. In other words, Steve ensured that the reflection stage was attended. *Second*, it appeared that the grade the coached teachers assigned did not depend on the length of the reflective stage, the amount of positive feedback given before they gave the grade or whether a coached teacher immediately wanted to initiate a new goal. The *third* pattern only emerged within the second and sometimes the third peer coaching sessions, in which the video with changed teacher behaviour was shown and discussed (i.e., the fourth step of the VIP procedure). To guide the discussion about this changed teacher behaviour, the Action Improvement Plan was used. Following this Action Improvement Plan, the coached teachers gave themselves with feedback, then received feedback from their colleagues, and, finally, evaluated the changed behaviour. After the evaluation, a new goal was formulated by the coached teachers, and their peer coaches applied solution-focused thinking. Steve steered this process, mainly by asking guiding questions.

4.3.2 Ineffective patterns of feedback

In the KLM group (the virtual group), it appeared that interaction only occurred once. The coached teachers mainly filled out their Action Improvement Plan. The peer coaches sometimes posted a reaction; however, there was only one case in which the coached teacher actually responded. In addition, feedback was given in less effective ways than in the face-to-face groups. In particular, many hints were provided, many evocative questions were posed, and judging appeared frequently (see also Chapter 3). To address the third aim of this study, the TFOS examined hinting, evocative questions, and judging within the face-to-face groups as well as whether these ineffective feedback patterns evolved into more effective feedback patterns.

Hinting occurred 43 times across the face-to-face sessions². Specifically, hinting occurred seven times in the observation stage, 32 times in the analysis stage, and four times in the reflection stage. In most cases, coached teachers turned hinting into more effective patterns of feedback. The coached teachers tended to agree with the hinting and then elaborated on the matter, sometimes followed by a discussion between the coached teachers and peer coaches as to the content of the hinting. If the coached teachers did not agree on the hinting, they explained why.

² These numbers are relative to the time of all sessions.

The peer coaches, who did not phrase a hint, also turned hinting into more effective feedback, by being positive. Finally, the process supervisor also interfered. Either he entered the next step in the process; for example, writing actions down in the Action Improvement Plan or he explained what coaching is.

Judging occurred 56 times across the face-to-face sessions. Specifically, judging occurred nine times in the observation stage, 33 times in the analysis stage, and 14 times in the reflective stage. In approximately half the cases, the coached teachers judged themselves. In the remaining cases, the judging was transformed into more effective ways of giving feedback. Several times, the coached teachers agreed and explained their thoughts about the contents of the judging from their peer coaches. In a few cases, the coached teachers weakened the judging. Furthermore, the peer coaches and the process supervisor, who did not judge, gave positive feedback. Finally, the process supervisor entered a new step in the process, for example, by asking the coached teachers to describe their planned actions. The judging remained ineffective only in one case. In the second session of the DEFG group, Eric (peer coach) judged Diana's (coached teacher) efforts in improving her classroom management. Then, Eric explained his own experience regarding temporarily expelling students from the classroom.

Evocative questions were posed 10 times across the face-to-face sessions. Specifically, two evocative questions were posed during the observation stage, six during the analysis stage, and two during the reflection stage. In most cases, the coached teachers provided an answer to the question. The process supervisor sometimes summarized what was said or turned to a next step in the process. Only in one case, in the second session of the DEFG group, was an evocative question posed to Gerald (coached teacher) by Eric (peer coach), which led Eric to answer the question himself. In sum, the TFOS indicated that in almost all cases, the ineffective patterns of hinting, judging, and evocative questions were turned into effective feedback patterns.

Some other ineffective feedback patterns emerged during the analysis stage. In two cases, one in which Diana was coached teacher and another in which Gerald was coached teacher (DEFG group's second session), Eric (peer coach) had awkward timing when he gave feedback. In both cases, Eric did not say much during the turns. At the end of the turn, when Steve already had suggested giving somebody else a turn as coached teacher, Eric interrupted and started asking questions. Another example of an ineffective feedback pattern was from Hedwig, who frequently tended to finish Isabelle's or Joanna's sentences in their turns as coached teachers. Finally, Steve slipped into an ineffective feedback pattern once. In the third session of the HIJ group, at the end of Hedwig's turn as coached teacher, Steve stated that there were only two minutes left in her turn. Then, Steve elaborated on his own experience as a teacher.

4.3.3 The process supervisor

An experienced process supervisor facilitated the face-to-face groups. The TFOS shows how he steered the process by asking guiding questions, how he reflected explicitly on the coaching behaviour of the participants, and how he interfered when feedback tended to become less effective. Steve (i.e., the process supervisor) led the VIP sessions by asking guiding questions, for instance: “Can you say once more what it is about?” and “Could you now record on your Action Improvement Plan what you are planning to do, in detail, when you go to teach that lesson?”

An example of how Steve reflected on the coaching behaviour and gave feedback is found in the third session of the HIJ group. During Hedwig’s turn as the coached teacher, Steve was silent, while Isabelle and Joanna coached Hedwig. After about 15 minutes, he interrupted the process by summarizing what had been said: “During the story, you [Hedwig] mentioned three aspects that you think are important, that you want to work on”. Steve repeated these three aspects and then reflected on the coaching and feedback process: “That question that Joanna posed made you think real hard about how you could try to perform those aspects”. During the remaining part of Hedwig’s turn, Steve steered the conversation in such a manner that these three aspects were all specified, so that Hedwig could record them in the Action Improvement Plan.

Steve intervened when feedback tended to become less effective, as is shown by an example of the ABC group’s first session. In Ann’s turn being the coached teacher, Chris (peer coach) summarized and analysed Ann’s goal: “[...] that is another moment when you need to start again. That costs loads of energy, while it may be better that before you start to give the instruction, you should ...” Then, Steve interrupted: “Hang on a minute. Your analysis is fine, but she [Ann] needs to draw the conclusion herself”. Subsequently, Steve took over the coaching and steered the process in such a manner that Ann drew the conclusion for herself. Steve also interfered in less effective feedback and encouraged the peer coaches to try again in a more effective way:

Coached teacher Britt: Yeah, I think, I should have said: ‘draw an atom’.

Peer coach Chris: Yes, maybe you should have done that.

Britt: Yes, but if I do so, they [the students] take out the old notes and they copy.

Chris: Then you say ‘you can’t use your notes, ask your neighbour student if you don’t know’.

Process supervisor Steve: Can I interrupt? Do you remember what the principle of coaching is?

Chris: Yes?

Steve: That is that you try, by asking questions, to support the other in thinking how to do better the next time.

Chris: Oh, yeah. I should have asked a question. So, how would you ...

4.4 DISCUSSION

The purposes of this study were to investigate the feedback process, to determine what effective feedback is, and to explore what interventions could be possible if feedback becomes less effective in face-to-face settings and in virtual settings. Based upon the literature review (Section 4.1.1 and Chapter 2), an instrument for observing feedback was developed: the Teacher Feedback Observation Scheme (TFOS). The TFOS was tested using videotaped sessions of three face-to-face groups and using one virtual group's wikis. All groups used the Video Intervention Peer coaching (VIP; Jeninga, 2003) procedure, which theoretically is a practical realisation of the theoretical concept of *Visible Learning* (see Table 4.1; Hattie, 2009). The data showed that, in practice, the VIP procedure realises the six signposts of *Visible Learning*. Therefore, the VIP procedure, at least in face-to-face settings, is a context in which teachers can give effective feedback to their colleagues. The TFOS supports this insight and can be used in other contexts in which teachers give feedback to each other, so that feedback patterns and their effectiveness in these contexts can be investigated. The pilot testing of the TFOS provides insights into the usefulness of the TFOS (Section 4.4.1) as well as preliminary insights into feedback and feedback patterns between teachers (Section 4.4.2).

4.4.1 Usefulness of the TFOS

The TFOS identifies five dimensions of feedback, two elements of feedback on problem solving, and five types of questions, thereby reflecting the feedback literature. The inter-rater reliability was substantial, though future studies may need to consider some elements for which Cohen's kappa was low (i.e., the dimensions of positive vs. negative and corrective vs. non corrective and hints). The TFOS, combined with the stages in the feedback process cycle (White, 2009), was able to categorize effective and ineffective feedback patterns in face-to-face groups as well as the virtual group.

To better understand feedback patterns, the TFOS could include other elements that emerged frequently during the sessions of the face-to-face groups. First, student-directedness and video-directedness can be added to the dimension goal-directedness vs. person-directedness. This addition appears to be context specific for the VIP procedure. Second, summarizing and acknowledging are both coaching skills that can positively affect the feedback process and could be added (Gallacher, 1997). Third, finishing a coached teacher's statement and providing an example of one's own classroom can be included, as they both emerged frequently. Nevertheless, it may be questioned whether these former activities enhance or hamper the process. Both seem to contradict solution-focused thinking (Jackson & McKergow, 2002), which may cause ineffective feedback patterns.

Another issue is that the TFOS only observes feedback. To better understand why some patterns are effective or not, the participants could be interviewed regarding their experiences during giving and receiving feedback. Thus, the TFOS is extended with a short questionnaire about how the feedback from each session was experienced and with an interview.

This pilot study indicates that feedback effectiveness does not depend primarily on how feedback messages are categorized, but rather on patterns or chains of combinations of the feedback dimensions, feedback on problem solving, and types of questions. Studies examining patterns of feedback are mainly conducted in the field of second language acquisition (Ashwell, 2000; Ferreira, Moore, & Mellish, 2007). Future research should investigate alternative methods of understanding the patterns found and why some are more effective than others. This knowledge can be used to instruct teachers as how to give more effective feedback to one another. In Chapter 5 (see Section 5.2.3), the TFOS will be adapted in accordance with the suggestions described in this section.

4.4.2 Feedback and feedback patterns: Results of the pilot study

The preliminary results indicate that the feedback process in the face-to-face groups is more effective than in the virtual group. A process supervisor guided the face-to-face groups in contrast to the virtual group. He steered the process by posing guiding questions, by modelling coaching behaviours (i.e., posing solution-focused, clarifying, open-ended questions), and by reflecting explicitly on the participants' coaching behaviours. Process supervisors can encourage effective feedback if they perform their role as intended. The results concerning feedback and feedback patterns cannot be generalized, due to the small research population and due to the fact that the conclusions are preliminary, because the TFOS was piloted.

Several patterns of feedback emerged in the face-to-face groups. If ineffective patterns of feedback occurred in the face-to-face groups, the participants would transform them into more effective patterns of feedback. Interactions in the virtual group did not occur, and therefore, such patterns could not arise. One possible explanation for the lack of social interaction in the virtual group is evident from the field of Computer Mediated Communication (CMC). According to CMC researchers, face-to-face conversations differ from conversations mediated by ICT, in that ICT limits the transfer of socio-emotional cues. These cues are necessary to create, sustain, and reinforce a positive group climate, in which a sense of community and committed social relationships exist. Feelings of community can increase the flow of information between group members, commitment to group goals, cooperation among the group members, and satisfaction with group efforts (Kreijns, Kirschner, & Jochems, 2003). Committed social relationships are a significant contributor to the effectiveness of information exchange (Warketin, Sayeed, & Hightower, 1997). In

sum, if social interaction and feedback is to occur in virtual groups, it is important to consider the limitations of ICT. Following Danchak, Walther, and Swan (2001), social awareness tools and training on writing virtual messages could be necessary to give effective virtual feedback. Future research could explore whether social awareness tools and training on writing virtual messages promote effective feedback. In the course of this dissertation, the influence of social presence on online feedback processes will be addressed (Chapter 6). Social presence concerns the feelings that other persons are real and lifelike in the online communication (Kreijns, Kirschner, Jochems, & van Buuren, 2011).

Future research could also investigate the learning outcomes of VIP participants in terms of their behaviour in the classroom. Learning outcomes are a key issue in feedback literature (Mory, 2003). Research has investigated how several types of feedback influence learning outcomes in different types of learning. It would be interesting to examine whether effective and ineffective patterns of feedback influence the teachers' behaviours in the classroom. This would provide additional insight into the effectiveness of types of feedback patterns among teachers.

4.4.3 Concluding remarks

This study was conducted to further expand the knowledge on feedback processes between teachers (see Scheeler et al., 2004), aiming to improve these processes. The literature review (Section 4.1.1 and Chapter 2) shows that feedback is a complex process with many confounding variables. This may explain the lack of an instrument that evaluates the quality of feedback. By constructing and validating such an instrument (i.e., the TFOS), important insights regarding effective feedback among teachers were found and directions for future research were established. In sum, the TFOS is suited to observe and categorize effective and ineffective feedback patterns in different settings (face-to-face and virtual). These insights lead to further improvement of teacher learning and teacher professional development. For instance, a recommendation for practice is that if teachers and schools choose to apply the VIP procedure, it requires a proficient process supervisor.

Furthermore, the results clearly indicate that the effectiveness of feedback does not primarily depend on how feedback messages are characterized, as is postulated in many feedback studies. The effectiveness of feedback depends on patterns or chains of interactions between providers and receivers, thereby organizing feedback into a multi-dimensional process. The pilot testing of the TFOS provides a solid argument for investigating alternative methodologies that examine the effectiveness of emerging feedback patterns.

Chapter 5

Investigating feedback on practice among teachers: Coherence of observed and perceived feedback

This chapter is based upon:

Thurlings, M., Vermeulen, M., Bastiaens, Th., & Stijnen, S. (in press). Investigating feedback on practice among teachers: Coherence of observed and perceived feedback. *Mentoring and Tutoring*.

5.1 INTRODUCTION

Benefits of feedback in supporting students' learning are confirmed in much research (Hattie, 2009; Hattie & Timperley, 2007; Mory, 2003; Shute, 2008). However, as Scheeler, Ruhl, and McAfee (2004) pointed out, there has been little investigation into feedback among teachers, which can serve as an effective tool for their professional development. As professional development is crucial for the quality of education (OECD, 2002), we aim to provide insights into (a) what effective feedback among teachers is like and (b) how teachers perceive feedback from their peer coaches.

5.1.1 Feedback among teachers

While research on feedback between teachers is scarce (Scheeler et al., 2004), we transfer ideas and definitions from previous studies on feedback from teachers to students to inform our own work and to provide insights on whether feedback given in hierarchical relationships can be adapted to feedback between peer coaches. In this study, feedback is described as "information that allows for comparison between an actual and a desired outcome" (Mory, 2003, p. 746). Characteristics of feedback can be synthesized along five dimensions (Thurlings, Vermeulen, Kreijns, Bastiaens, & Stijnen, 2012; see also Section 4.1.1):

1. Goal-directedness vs. person-directedness (Black & Wiliam, 1998a; Gibbs & Simpson, 2004);
2. Specific vs. general (Black & Wiliam, 1998a; Mory, 2003; Scheeler et al., 2004);
3. Detailed vs. non-detailed (Gibbs & Simpson, 2004; Scheeler et al., 2004; Weaver, 2006);
4. Positive vs. negative; (Scheeler et al., 2004; Schelfhout, Dochy, & Janssens, 2004; Weaver, 2006);
5. Immediate vs. delayed (Mory, 2003).

Drawing upon these dimensions, we can define effective and ineffective feedback. First, it is suggested that goal-directed feedback is more effective than person-directed (Black & Wiliam, 1998a; Gibbs & Simpson, 2004) or non goal-directed (Hattie & Timperley, 2007). Second, it is argued that specific feedback is more effective than general (Black & Wiliam, 1998a; Mory, 2003; Scheeler et al., 2004), though general advice on how to improve one's actions in the future is effective too (Black & Wiliam, 1998b; Weaver, 2006). Third, it is suggested that feedback that includes details is more effective than if it lacks details (Gibbs & Simpson, 2004; Scheeler et al., 2004; Weaver, 2006). Fourth, it is unclear whether positive feedback is more effective than negative. Some scholars argued that it should be positive (Scheeler et

al., 2004; Tillema & Smith, 2000), whereas others argued that negative feedback can motivate learners in their learning process (Schelfhout et al., 2004). Still others argued that when positive and negative comments are balanced, feedback is more effective (Weaver, 2006). Moreover, Hattie and Timperley (2007) suggested that feedback on the self level – irrespective of whether it is positive or negative – is not effective, because it does not provide information on how learners can improve their actions. Fifth, immediate feedback is considered more effective than delayed (Mory, 2003). In addition, delayed feedback is less effective than if it is still relevant for the learner (Black & Wiliam, 1998a; Scheeler et al., 2004).

Based on this literature, we assumed that goal-directed, specific, and detailed feedback that is neutral (neither positive nor negative) is more effective than non-goal/person-directed, general, vague, and either too positive or too negative feedback. The fifth dimension – timing – was not included in the study, because feedback was always communicated during the peer coaching sessions, and in addition, adequate timing is difficult to observe. When feedback is given in peer groups, such as in this research, the question arises how peer coaches (providers) can encourage the coached teachers (receivers) to be goal-directed, specific, detailed, and neutral and can simultaneously help them to avoid being person- or non-goal-directed, general, non-detailed, and either too positive or too negative.

We investigated a number of elements that may lead to effective feedback in peer groups as well as elements that may provoke ineffective feedback. These elements are based upon literature on coaching as well as the peer coaching program (Gallacher, 1997; Jackson & McKergow, 2002; Jeninga, 2003; Smith & Ragan, 1993; see also Chapter 4, Section 4.1.3 and Thurlings et al., 2012). Feedback elements were made operational as open-ended, closed, guiding, solution-focused, and evocative questions, continuous questioning, summarizing, acknowledging, judging, hinting, finishing sentences, and providing examples from one's own classroom or experience.

Based on the peer coaching program, we formulated expectations of the effectiveness of these elements. Effective elements strengthen the dimensions; that is, they push the feedback dimensions in the desired direction. Ineffective elements weaken the dimensions, pushing them away from the desired direction. We expected that (a) open-ended, closed, solution-focused, and guiding questions, continuous questioning, acknowledging, and summarizing would be effective and (b) hinting, judging, evocative questions, providing an example from one's own experience, and finishing sentences would be ineffective.

Perceived feedback was also included in the study. Perceived feedback is a factor that can support students' learning in formative assessment (Gibbs & Simpson, 2004). Gibbs and Simpson (2004) described that, in quantitative terms, sufficient feedback should be given frequently and should hold enough details. In qualitative terms, it should be focused on performances that learners can control. Further-

more, it should be appropriate for the tasks learners are performing and should consider learners' understanding of what they should be doing. Moreover, they argued that feedback should be received, attended to, and acted upon in such a way that student learning becomes optimal. If feedback is perceived in alignment with these conditions, Gibbs and Simpson (2004) suggested that student learning is reinforced.

In summary, we divided feedback into four dimensions and twelve elements. We assumed that feedback that is goal-directed, specific, detailed, and neutral (neither positive nor negative) is more effective than when it is non-goal/person-directed, vague, non-detailed, and either too positive or too negative. We studied the influence of the elements on the dimensions, expecting that (a) open-ended, closed, solution-focused, and guiding questions, continuous questioning, acknowledging, and summarizing are effective and (b) hinting, judging, evocative questions, providing an example from one's own experience, and finishing sentences are ineffective. In addition, perceived feedback was investigated. Furthermore, we attended to the coherence of observed and perceived feedback.

5.2 METHODS

5.2.1 Research context and questions

In this study, we focused on feedback among teachers within a specific professional development activity, namely the Video Intervention Peer coaching procedure (Jeninga, 2003; see also Section 1.4), implemented in two Dutch primary schools. Elements of this procedure are reciprocal peer coaching, videotaped lessons, solution-focused thinking, and a cyclic workflow consisting of two sessions. In the first session, goals are set and actions are formulated. In the second session, the performed actions are evaluated (Jeninga, 2003). The aim of the procedure is to guide teachers in improving their own teaching behaviours, for instance, being more consistent in applying the classroom rules. Process supervisors participate in peer coaching groups. These persons act as chairmen and model coaching behaviour using solution-focused thinking.

In the cyclic workflow, three phases were distinguished: (a) the observation phase, in which teachers watch and discuss each other's videos, (b) the analysis phase, in which they discuss and formulate goals and actions, and (c) the reflection phase, in which the teachers evaluate their changed teaching behaviours (White, 2009).

We formulated the following research questions:

1. To what extent do participants that receive effective feedback (as described in the theoretical framework) perceive this feedback as effective;

and to what extent do participants that receive ineffective feedback perceive this feedback as ineffective?

- a. To what extent is effective feedback given; which feedback elements are effective and which are ineffective; and are there differences imposed by the three phases of the coaching sessions?
- b. How did participants perceive feedback?

5.2.2 Participants

Twelve teachers from two Dutch primary schools participated in the program. At each of the schools, the peer coaching program (i.e., the VIP procedure) has previously been implemented under the guidance of our colleagues. We approached the schools and teachers to seek their involvement in the study. Hence, the study was conducted in a naturalistic setting.

Of the 12 participants, two were men and ten were women. Their mean age was 30.7 years old ($sd = 6.7$ years). The teachers were divided into four peer groups. Three groups (nine teachers) were from one primary school; the other group of three teachers was from another primary school. Each group was joined by a different process supervisor (two males; two females). All process supervisors and some of the teachers were experienced in applying the peer coaching program.

5.2.3 Observations

The peer coaching sessions were videotaped and transcribed. Subsequently, each teacher's turn being the coached teacher was divided into the phases of observation, analysis, and reflection (White, 2009). Next, the teachers' turns were analyzed using the Teacher Feedback Observation Scheme (TFOS), which was developed to observe feedback given within the peer coaching sessions and to determine its quality (Thurlings et al., 2012). The TFOS' inter-rater reliability was shown to be substantial (Thurlings et al., 2012; see Section 4.2.3). Cohen's Kappa – that expresses the inter-rater reliability (Landis & Koch, 1977) – averaged 0.765 with a minimum of 0.410 and a maximum of 1.000. The TFOS was based upon literature as described above (Section 5.1.1) and distinguished the four dimensions (goal-directedness, specificity, details, and positivity) and the 12 elements (e.g., open-ended and guiding questions, hinting, and summarizing).

The scoring of these dimensions and elements in each utterance of coached teachers and their peer coaches was conducted using Excel. The scoring of the dimensions was executed as follows:

- When an utterance was completely goal-directed, we assigned a score of 4.
- When an utterance was completely non-goal/person-directed, we assigned a score of -4.

- When an utterance was balanced between goal-directedness and non-goal/person-directedness, we assigned a score of 0.
- Between these extremes (+4 and -4) and the zero-point, a +2 and a -2 can be assigned.

This method resembled a Likert-type scale and was also applied for the other dimensions.

The feedback elements (e.g. closed questions, acknowledging, and judging) were assigned either a 1 or a -1, when the element respectively was expected to be effective (e.g. open-ended questions) and ineffective (e.g. hinting). By assigning either a 1 or a -1, the elements are easily distinguished from the dimensions.

As a result from the preliminary findings in Chapter 4 (Sections 4.4.1 and 4.4.2), the TFOS was optimized. The method for scoring the dimensions and elements was adapted. Furthermore, concerning the dimensions, the dimension *corrective vs. non-corrective* was deleted, because it hardly occurred, and, moreover, the dimension is less relevant to the coaching process. Concerning the elements, the element *clarifying question* was assimilated into continuous questioning, because both elements aim to gather more information on a given subject. Furthermore, *summarizing*, *acknowledging*, *finishing sentences*, and *providing an example from one's own experience* were added as feedback elements, following our suggestions as proposed in Section 4.4.1. In addition, the TFOS now includes questionnaires (Section 5.2.4) and an interview (Section 5.2.5) that aim to capture the participants' perceptions (see Section 4.4.1).

5.2.4 Questionnaires

After each peer coaching session, teachers completed a questionnaire by which we could examine how they perceived feedback within the session. Three subscales of the Assessment Experience Questionnaire (AEQ) were used to evaluate these perceptions (Gibbs & Simpson, 2003). The AEQ is based upon factors that support student learning (see Section 5.1.1). The three subscales were *quantity of feedback* ($\alpha = 0.693$), *quality of feedback* ($\alpha = 0.662$), and *what a student does with the feedback* ($\alpha = 0.614$). The Chronbach's α found in our sample were slightly lower than the ones Gibbs and Simpson found ($\alpha_{quantity} = 0.87$; $\alpha_{quality} = 0.77$; $\alpha_{do\ with\ feedback} = 0.74$), though their sample of almost 800 students was much larger than ours of 21 questionnaires (see Section 5.2.6).

The items were adapted to fit the peer coaching program. One item of the scale *quality of feedback* was eventually deleted because this improved Chronbach's α from 0.473 to 0.662 and because the item "The feedback mainly tells me how well I am doing in relation to others" was less relevant to the peer coaching program.

Therefore, the respective numbers of the items of the scales were eight, five, and eight. The items were answered on a five-point scale.

5.2.5 Interviews

After the observations and questionnaires were collected, we approached teachers by e-mail to elicit their participation in a semi-structured interview. The interview questions were discussed in the research group and were pilot tested. Based on the discussion and the pilot test, we slightly adapted the interview by altering the sequence of questions.

Seven teachers agreed to be interviewed by telephone. Each interview took about 20 to 30 minutes. By executing these interviews, we aimed to gather qualitative data on how teachers had experienced feedback. A report was made for each interview and sent to the individual teachers so that they could ensure their opinions were accurately reflected.

5.2.6 Data collection

Three of the four peer groups had two peer coaching sessions in which teachers went through the cyclic workflow once, thus, most teachers had two coaching turns. Two teachers were only present during one session and as a consequence did not complete the questionnaire. Another teacher was present during both sessions, however, she failed to complete the questionnaire after one of the sessions. The fourth peer group had three sessions, but each teacher was present only twice, which enabled each teacher of this group to experience the cyclic workflow once.

Each peer coaching session was videotaped. The videotapes were then transcribed. After each peer coaching session, the questionnaires were completed. Finally, the interviews took place. It was possible to connect the observations, questionnaires, and interviews to each individual participant.

Because most teachers had more than one turn being the coached teacher (they were present during both sessions), two observational videotapes were recorded for most teachers and they completed two questionnaires. There were two teachers who were not present during a session and they did not complete the questionnaire; another teacher did not complete her questionnaire after one session. Thus, we collected 21 sets of data consisting of observational videotapes and accompanying questionnaires.

5.2.7 Data-analysis

We performed non-parametric tests to address research questions 1a and 1b (see Section 5.2.1). Non-parametric tests are designed for small samples, such as ours,

that do not meet the assumptions for parametric tests (Field, 2005; Moore & McCabe, 2003).

We approached research question 1a in two main steps. After coding the observations using the TFOS, we performed Kruskal-Wallis tests – the non parametric counterpart of ANOVA (Baarda, De Goede, & Van Dijkum, 2007; Moore & McCabe, 2003) – in order to test whether the four feedback dimensions differed between the phases of observation, analysis, and reflection. We also performed additional Mann-Whitney tests – the non parametric counterpart of the *t*-test – because the mean ranks pointed at possible significant differences between the phases.

Second, for each phase of all teachers' turns, we made timeline graphics of the Excel files. By putting the scoring of the feedback dimensions as well as the elements on a timeline, we were able to determine if and how the elements affected the dimensions and to identify feedback patterns, following our own suggestions (see Section 4.4.1).

We determined the effectiveness of each feedback element by comparing the position of the dimensions in the utterances on the timeline before and after the element occurred. If the dimensions were higher after the element than before, the element was counted as effective. If the dimensions were equal to or lower than before the element occurred, the element was counted as ineffective. The effectiveness could not be determined for all elements (e.g., those elements in the first utterance of a coaching session), because there was no previous utterance with which we could compare the second utterance.

To approach research question 1b, we analysed the questionnaires and interviews. Concerning the questionnaires, we performed non-parametric Wilcoxon signed rank tests – the counterpart of the paired *t*-test (Baarda et al., 2007; Moore & McCabe, 2003). These tests investigated whether the perceptions of feedback changed from session to session. The semi-structured interview questions made it possible to compare participants' answers, showing similarities and differences amongst them.

In order to answer the main research question, we constructed a case-ordered descriptive meta-matrix (Miles & Huberman, 1994). We used the results of the questionnaires to construct four groups of cases within this meta-matrix. A summarized excerpt of this meta-matrix is shown in Table 5.5. Each case consisted of one teacher's individual scores on the three subscales of the AEQ and the findings of their individual observations from one session. There were 21 cases in total (see Section 5.2.6). The four groups were constructed based on the results of the questionnaires only, and we subsequently investigated whether the observation findings corroborated the findings of the questionnaires.

5.3 RESULTS

This section comprises four parts: results of the observations (research question 1a; Section 5.3.1); results of the questionnaires (research question 1b; Section 5.3.2); results of the interviews (research question 1b; Section 5.3.3); and, finally, the results of the case-ordered descriptive meta-matrix (main research question; Section 5.3.4).

5.3.1 Observations

In this section, we first present the results of the feedback dimensions (the first main step to answer research question 1a, see Section 5.2.7). Then, we address the number of feedback elements, and subsequently, we focus on the effectiveness of these feedback elements (the second main step to answer research question 1a, see Section 5.2.7).

5.3.1.1 Feedback dimensions

Table 5.1 shows the descriptives of the feedback dimensions. Regarding goal-directedness, the Kruskal-Wallis test showed that the dimension did not differ significantly among the phases ($\chi^2 = 2.239$, $df = 2$, $p = 0.326$). The mean ranks for this dimension were 21.17 for observation phases, 23.78 for analysis phases, and 29.00 for reflection phases. These mean ranks differed quite a bit, which may indicate potential differences between the phases. Therefore, additional Mann-Whitney tests were performed. However, there were no significant differences between the phases (observation – analysis: $U = 143.00$, $p = 0.547$; observation – reflection: $U = 67.00$, $p = 0.150$; analysis – reflection: $U = 76.00$, $p = 0.301$). This illustrated that the degree of goal-directedness did not differ between the phases.

The dimension of specificity did not differ significantly amongst the phases ($\chi^2 = 0.084$, $df = 2$, $p = 0.959$). The mean ranks for this dimension were 24.56 for observation phases, 23.28 for analysis phases, and 24.27 for reflection phases. The dimension of details differed significantly among the phases ($\chi^2 = 6.032$, $df = 2$, $p = 0.049$). The mean ranks for this dimension were 18.64 for observation phases, 24.83 for analysis phases, and 31.41 for reflection phases. This implied that in the observation phases fewer details were provided in the feedback than in the analysis phases and that fewer details were provided during the analysis phases than in the reflection phases. The dimension positivity differed significantly among the phases ($\chi^2 = 12.330$, $df = 2$, $p = 0.002$). The mean ranks for this dimension were 16.36 for observation phases, 25.42 for analysis phases, and 34.18 for reflection phases. This suggested that feedback in the observation phases was more neutral whereas in the

analysis phases more positive feedback was given and even more positive feedback was given in the reflection phases.

Table 5.1 Descriptives of the dimensions for each phase

Phases	M	SD	Minimum	Maximum	n (phases)	n (utterances)
<i>Goal vs. non-goal/person-directed</i>						
Observation	1.77	0.98	-0.007	4.00	18	335
Analysis	1.89	0.82	0.34	3.33	18	1,601
Reflection	2.15	0.83	0.19	3.11	11	479
<i>Specific vs. general</i>						
Observation	0.87	0.55	0.00	2.00	18	335
Analysis	0.74	0.38	-0.003	1.56	18	1,601
Reflection	0.83	0.46	0.17	1.78	11	479
<i>Detailed vs. non-detailed</i>						
Observation	0.95	0.49	0.29	2.00	18	335
Analysis	1.09	0.33	0.51	1.56	18	1,601
Reflection	1.34	0.53	0.17	2.13	11	479
<i>Positive vs. negative</i>						
Observation	0.06	0.11	-0.14	0.28	18	335
Analysis	0.17	0.17	0.00	0.61	18	1,601
Reflection	0.39	0.37	0.00	1.33	11	479

5.3.1.2 Feedback elements

Table 5.2 shows that most elements (e.g., closed questions, summarizing, and hinting) were given during the analysis phases. This is not surprising, because the analysis phases took more time than the other phases and as a consequence, more utterances were spoken. Generally, more expected effective elements were phrased than expected ineffective elements.

5.3.1.3 Effectiveness of feedback elements

The key questions here were (a) did expected effective elements lead to more effective dimensions and (b) did expected ineffective elements lead to more ineffective dimensions? The second column of Table 5.3 shows how many times the elements evoked the four dimensions to be more effective (*yes*) or not (*no*). The table indicates that in most cases the expected effective elements caused the dimensions to be more effective and that expected ineffective elements caused the dimensions to be less effective. Closed questions, summarizing, and acknowledging, however, had a different effect than was expected – the dimensions were not affected at all or they became less effective.

Table 5.2 Number of expected (in) effective elements for the phases

Feedback elements	Observation	Analysis	Reflection
<i>Expected effective elements</i>			
Guiding questions	52	115	78
Open-ended questions	16	142	52
Closed questions	55	217	67
Solution-focused questions	5	67	19
Continuous questioning	28	215	63
Summarizing	14	158	45
Acknowledging	8	66	35
<i>Expected ineffective elements</i>			
Evocative questions	3	13	3
Hinting	2	93	12
Judging	0	17	3
Finishing sentences	2	41	9
Providing own example	0	26	11

Table 5.3 The effectiveness of elements on dimensions within the phases

Feedback elements	Effectiveness	Observation	Analysis	Reflection
<i>Expected effective elements</i>				
Guiding questions	Yes	27	48	21
	No	12	37	27
Open-ended questions	Yes	11	106	44
	No	8	38	10
Closed questions	Yes	24	93	37
	No	28	125	36
Solution-focused questions	Yes	4	49	17
	No	1	20	5
Continuous questioning	Yes	18	147	49
	No	9	104	23
Summarizing	Yes	5	70	17
	No	6	74	24
Acknowledging	Yes	1	31	13
	No	8	45	23
<i>Expected ineffective elements</i>				
Evocative questions	Yes	1	6	2
	No	2	4	1
Hinting	Yes	1	38	5
	No	1	59	12
Judging	Yes	0	4	2
	No	1	12	1
Finishing sentences	Yes	1	14	2
	No	1	38	7
Providing own example	Yes	0	7	6
	No	0	20	5

Forty percent of the expected effective elements were indeed effective and 60% were not effective. Of the expected ineffective elements, 33% were effective and 67% were indeed ineffective.

A pattern that illustrates the percentages of effectiveness of the expected effective elements (i.e., 40–60%) emerged frequently in all teachers’ turns. This pattern shows that two or three expected effective elements were not effective and then a third or fourth element was effective. This often occurred with continuous questioning (see Figure 5.1).

The continuous questioning at point two influenced the dimension of goal-directedness to decrease and the other dimensions to remain at the same level (comparison of point one and three; see Figure 5.1). Likewise, the continuous questioning at point four did not influence the dimensions. They remained at the same level, and consequently, this continuous questioning was also not effective. However, the final continuous questioning at point six enhanced the dimensions of specificity and details to rise and did not influence the dimensions of goal-directedness and positivity. Therefore, this final continuous questioning was effective.

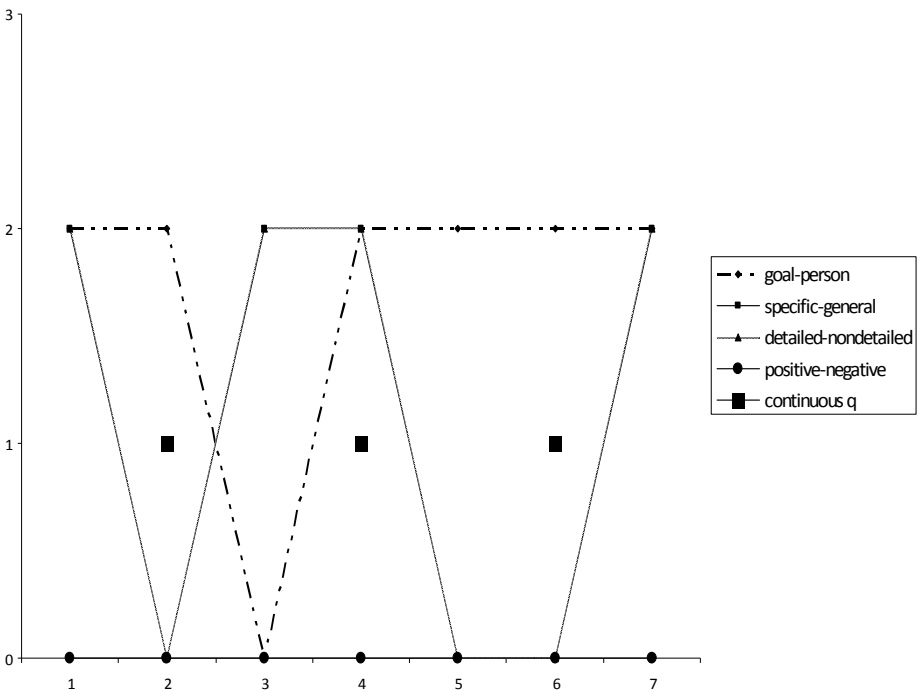


Figure 5.1 An example of the pattern of ineffective continuous questioning that turned into effective continuous questioning.

Note. The dimension specificity has the same line as the dimension details.

5.3.2 Questionnaires

Table 5.4 indicates that the participants' perceptions of feedback only changed slightly from session to session. None of these changes were significant ($Z_{quantity} = -0.962, p = 0.336$; $Z_{quality} = -0.414, p = 0.679$; $Z_{what\ to\ do\ with\ feedback} = -0.530, p = 0.596$). Quantity was perceived better than quality and the participants rated what they did with feedback slightly lower than its quantity and quality.

Table 5.4 Descriptives of the AEQ subscales

AEQ	M	SD	Minimum	Maximum	Number of items	n
<i>First questionnaire</i>						
Quantity	4.33	0.44	3.63	5.00	8	10
Quality	4.12	0.57	3.20	4.80	5	10
Do with feedback	4.01	0.29	3.63	4.50	8	10
<i>Second questionnaire</i>						
Quantity	4.43	0.32	4.00	5.00	8	9
Quality	4.18	0.56	3.00	4.80	5	9
Do with feedback	4.07	0.50	3.50	4.88	8	9
<i>Third questionnaire</i>						
Quantity	5.00	0.00	-	-	8	2
Quality	5.00	0.00	-	-	5	2
Do with feedback	4.13	0.71	3.63	4.63	8	2

5.3.3 Interviews

Four of the seven interviewed teachers said that they had positive experiences with feedback given in the sessions. The teachers held different views about how to define and describe effective feedback: three teachers described effective feedback as receiving hints on how to solve something; two teachers defined it as receiving compliments; and two teachers described it as receiving questions that support to find your own solution. In addition, teachers described effective feedback as a reflection, a reaction, and perspectives from colleagues. Teachers had a more similar opinion about ineffective feedback: it contained a hint that is unusable or it was too confronting. One teacher never had a negative experience with feedback. Furthermore, three teachers argued that feedback could never be ineffective, because one can always learn something. The teachers learned from the interplay of making video recordings of their teaching behaviours, the peer coaching from their colleagues who asked open-ended, solution-focused questions that guided the coached teachers to find their own solution, and receiving effective feedback.

5.3.4 Case ordered meta-matrix

By applying the meta-matrix, we examined whether effective observed feedback was also perceived as more effective than observed ineffective feedback. In the meta-matrix, four groups were discerned. In the *first* group, teachers had lower than average scores on the three AEQ subscales. This LLL group³ held six cases. Teachers in the *second* group scored lower than average twice and higher than average once on the AEQ subscales. This LLH group consisted of four cases. In the *third* group, teachers had two higher than average and one lower than average scores on their AEQ. This HHL group held five cases. Teachers in the *fourth* group had scores higher than average on all subscales of the AEQ. This HHH group consisted of six cases.

In order to discern whether these findings corroborate with the results of the observations, we chose a representative from each group (see Table 5.5). First, the average scores of these four representatives reflected the scores on the AEQ of their individual groups. Even though Yonathan (representative of the LLL group) received more expected effective elements than Patty (representative of the LLH group), the latter's ratio of effectiveness of the expected effective elements was much higher than the former. Only 30% of expected effective elements were effective in Yonathan's turn whereas the average was 40% and Patty had a ratio of 52% of effectiveness. However, the ratio of effectiveness of expected ineffective elements was favourable for Yonathan. His ratio was 37%, which was about average, while Patty's ratio was only 13%.

The main difference between Patty (representative of the LLH group) and Susan (representative of the HHL group) lies in the amount of received elements. Of all elements Patty received, 79% were expected to be effective, which was lower than average. Meanwhile, 94% of all elements Susan received were expected to be effective. The ratios of effectiveness of both expected effective and ineffective elements were quite similar for Patty and Susan.

The main difference between Susan (representative of the HHL group) and Venus (representative of the HHH group) lies in the ratio of effectiveness of the expected ineffective elements. Compared to an average of 33%, only 16% of all ineffective elements Susan received were effective, while 43% of all ineffective elements Venus received were effective.

³ The name of the groups is constructed based upon the scores on the AEQ, where /L/ means lower than average and /H/ means higher than average.

Table 5.5 Overview of the four representatives of the four groups of cases

Cross case matrix	Yonathan (LLL)	Patty (LLH)	Susan (HHL)	Venus (HHH)
<i>Perceived feedback</i>				
Quantity	<u>4.25</u>	<u>4.13</u>	5.00	4.75
Quality	<u>3.00</u>	<u>4.20</u>	5.00	4.80
Do with feedback	<u>3.50</u>	4.50	<u>3.63</u>	4.38
<i>Observed feedback</i>				
Expected effective vs. expected ineffective elements	89–11	<u>79–21</u>	94–6	87–13
Effectiveness vs. ineffectiveness of expected effective elements	<u>30–70</u>	52–48	50–50	54–46
Effectiveness vs. ineffectiveness of expected ineffective elements	37–63	<u>13–87</u>	<u>16–84</u>	43–57

Note. The participants' individual scores on the AEQ subscales are shown; the findings of their observed feedback are expressed in percentages.

Note. Underlined numbers are lower than average; italicised numbers are higher than average; non marked numbers are average.

5.4 DISCUSSION

In this chapter, we focused on observed and perceived feedback on practice among teachers and the coherence between them. We triangulated data from observations, questionnaires, and interviews with 12 Dutch primary school teachers. The teachers participated in a peer coaching program (Jeninga, 2003). We aimed to investigate whether observed effective feedback was also perceived as more effective than observed ineffective feedback and whether this observed ineffective feedback was perceived as less effective.

Effective feedback was defined as goal-directed, specific, detailed, and neutral; ineffective feedback was defined as non-goal/person-directed, vague, non-detailed, and either too positive or too negative. Because feedback was communicated in peer coaching sessions, feedback was continuously given by all participants, including the coached teachers. In order to investigate how participants can encourage each other to give goal-directed, specific, detailed, and neutral feedback and avoid non-goal- or person-directed, vague, non-detailed, and either too positive or too negative feedback, feedback elements were also studied. These elements (e.g., open-ended and guiding questions, acknowledging, and hinting) were expected to either heighten or lower the feedback dimensions. In order to observe feedback dimensions and elements, the Teacher Feedback Observation Scheme (TFOS; Thurlings et al., 2012) was used. In the observations, the three phases of observation, analysis, and reflection (White, 2009) were also used.

Concerning research question 1a, the results on the four feedback dimensions showed that the dimensions of details and positivity differed among the phases. Both dimensions were low in the observation phases, moderate in the analysis phases, and high in the reflection phases. Second, the results showed that more expected effective feedback elements were phrased than expected ineffective elements. Third, the average effectiveness of expected effective elements was 40% and the average effectiveness of expected ineffective elements 33%.

Contrary to our expectations based on previous literature, closed questions, summarizing, and acknowledging were generally not effective. Instead of asking closed questions, it may be better for peer coaches to try to formulate open-ended questions, because these questions were usually shown to be effective. Summarizing is probably not effective, because it wraps things up before turning to a new issue. Effective summaries were accompanied by an open-ended question, which provoked coached teachers to elaborate more and probably thereby affected the feedback dimensions. Acknowledging in itself may not be effective, but might be necessary in terms of relatedness (Ryan & Deci, 2000; see also Section 3.5). If coached teachers felt that their peer coaches acknowledged them in their goals, coached teachers were more receptive for questions, which helped them to tackle the problem. Most expected ineffective elements (67%) were indeed ineffective.

In general, teachers had positive perceptions of the feedback (cf. Goodnough, Osmond, Dibbon, Glassman, & Stevens, 2009; Yang & Liu, 2004). The interviews also indicated that teachers were positive about the feedback they received from their peer coaches. They had different views on what effective feedback is, but had similar views on what ineffective feedback is: an unusable hint or too confronting comments. Effective feedback was seen either as useful hints, perspectives from colleagues, compliments, questions, and a reflection or reaction.

The meta-matrix – of which a summarized excerpt was shown in Table 5.5 – used in order to address the main research question shows that the findings of the observations also differed between the representatives of the four groups, corroborating with the results of the questionnaires. In other words, if observed feedback was determined to be effective, the receiver perceived feedback as more effective than if observed feedback was less effective, and that feedback was perceived as less effective.

These results indicated that it is not only important to phrase expected effective elements, but also that they really are effective in terms of the dimensions. If these requisites are met, participants are more likely to perceive feedback as more effective, which in turn may lead to better learning outcomes.

5.4.1 Conclusions

The literature study, which mainly contained articles on teacher to student feedback, is confirmed for teacher-to-teacher feedback. This implies that effective feedback is similar for any kind of learner.

In addition, the elements of the peer coaching program are proven as an effective professional development activity: watching video excerpts, asking open-ended, solution-focused questions, acknowledging coached teachers, and helping them to tackle their goals are confirmed as parts of an effective feedback environment.

Furthermore, the expected effective feedback elements were overall effective and expected ineffective elements were overall ineffective. Our research indicates that two aspects are crucial when feedback is given in peer coaching programs. As an implication, we suggest that enough expected effective elements should be given and their actual effectiveness ratio should be 40% or more. In addition, if feedback providers phrase expected ineffective elements, it is important that these elements somehow provoke receivers to be goal-directed, specific, detailed, and neutral.

5.4.2 Future research

In future research, the interaction between the actual content of feedback and the effectiveness of the elements can be examined. In such a study, we may further explain why certain elements are sometimes effective and sometimes not.

In addition, it could be explored whether feedback providers matter. Do receivers react differently to feedback from their process supervisors or their peer coaches?

Finally, teachers preferred hints, though most hints were shown to be not effective. In future research, we plan to focus on how teachers experience receiving hints and whether there are different styles of providing hints: would an authority hint (e.g., "You should ...") or a constructive hint (e.g., "Maybe, you could ...") prove beneficial and what their effects on feedback processes would be.

Chapter 6

The importance of social presence and feedback in online peer coaching

This chapter is based upon:

Thurlings, M., Vermeulen, M., Bastiaens, Th., & Stijnen, S. (submitted). The importance of social presence and feedback in online peer coaching.

6.1 INTRODUCTION

Society is more and more influenced by a digital revolution and, consequently, online learning has taken an enormous leap (Bernard et al., 2004; Caballé, Daradoumis, Xhafa, & Juan, 2011; Murphy, Mahoney, Chen, Mendoza-Diaz, & Yang, 2006). For instance, learners can join Virtual Action Learning or courses at Open Universities. Major advantages of online learning are time and place independency and that learning can occur close to the workplace. In addition, online learning makes it possible to learn from and with external coaches. Finally, online learners can function as a *Community of Practice* in which they share information, experiences, and knowledge (Wenger & Snyder, 2000).

Feedback has long been recognized as an effective learning tool (Hattie, 2009; Hattie & Timperley, 2007; Mory, 2003). However, research on feedback in online learning environments mostly focuses on written, asynchronous feedback in language and writing education (e.g., Hyland & Hyland, 2006; Tuzi, 2004) or at student perceptions and preferences (e.g., Goodnough, Osmond, Dibbon, Glassman, & Stevens, 2009; MacDonald, 2001; Yang & Liu, 2004). Moreover, “in the literature on computer-supported cooperative work, feedback itself is rarely mentioned” (Geister, Konradt, & Hertel, 2006, p. 465).

In addition to the lack of research on synchronous feedback in online learning, research on feedback among (student) teachers is limited (Scheeler, Ruhl, & McAfee, 2004; see also Chapter 2). Therefore, in this study, we examine feedback processes in an online synchronous peer coaching program for student teachers. Moreover, this study builds on the lessons learned from Chapter 3 (see Section 3.5.1), especially by implementing a synchronous environment that allows continuous and structured interaction, which was a major pitfall in Chapter 3. Section 6.2.4 elaborates on how these and other lessons learned were incorporated in this study.

This study conceptualized feedback as a social interaction process (see Section 6.1.1). Social interaction processes are influenced by social presence (Tu, 2000; Tu & McIsaac, 2002). Social presence is considered as the notion that other persons are real in the online communication (Kreijns, Kirschner, Jochems, & van Buuren, 2011). Moreover, online interaction influences online learning, and therefore, it is expected that feelings of social presence affect feedback processes.

This chapter has two purposes. The first aim is to investigate the coherence of observed and perceived feedback; that is, whether student teachers who receive more effective feedback also perceive this to be more effective than student teachers who receive less effective feedback (research question one). The second aim is to explore whether feelings of social presence influence perceived (research question two) and observed feedback (research question three; see Section 6.1.4 for the research questions).

6.1.1 Feedback

In this research, feedback is defined as “information that allows for comparison between an actual and a desired outcome” (Mory, 2003, p. 746) and is constantly given by peer coaches and by coached teachers themselves. This conceptualization of feedback suggests that feedback is similar to and given within social interaction.

Because former research has shown that few studies elaborated on feedback among teachers (Scheeler et al., 2004), we performed a literature review to update and further explore the concept (Thurlings, Vermeulen, Kreijns, Bastiaens, & Stijnen, 2012; see also Chapters 2 and 4). This literature review characterized feedback in four dimensions: (a) goal-directedness vs. non-goal/person-directedness, (b) specific vs. general, (c) detailed vs. non-detailed, and (d) positive vs. neutral vs. negative (Thurlings et al., 2012). Based on this literature review, we assumed that goal-directed, specific, and detailed feedback that is formulated in a neutral manner is more effective than feedback that is person-directed, general, vague, and either too positive or too negative. Every participant in the online peer coaching program is admitted to these dimensions.

In addition to these dimensions, feedback was described as feedback elements. These elements are based upon literature on coaching as well as the peer coaching program (Gallacher, 1997; Jackson & McKergow, 2002; Jeninga, 2003; Smith & Ragan, 1993; see also Thurlings et al., 2012 and Chapter 5). Feedback elements were made operational for instance as solution-focused and evocative questions, summarizing, judging, and providing examples from one’s own experience. The elements are given by the peer coaches.

In the social interaction process, these elements can affect the feedback dimensions by either pushing the dimensions in the right directions, which means that the elements are effective or by pushing the dimensions away from the right directions, which means that the elements are not effective. Based on the peer coaching program, coaching literature, and a former study (Thurlings, Vermeulen, Bastiaens, & Stijnen, *in press*; see also Chapter 5), expectations of effectiveness of these feedback elements were formulated. Seven elements were expected to be effective: open-ended, closed, solution-focused, and guiding questions, continuous questioning, summarizing, and acknowledging. Five elements were expected to be ineffective: evocative questions, hinting, judging, finishing coached teachers’ sentences, and elaborating on one’s own experience.

Effective feedback is thus the combination of the four dimensions, the 12 feedback elements, and the influence of the elements on the dimensions.

6.1.2 Perceived feedback

Perceived feedback is a factor that can support learning in formative assessment (Gibbs & Simpson, 2004). Moreover, research in formative assessment has shown

that feedback perceptions affect approaches to learning (see e.g., Scouller, 1998; Segers, Gijbels, & Thurlings, 2008).

Gibbs and Simpson (2004) described that, in quantitative terms, sufficient feedback should be given frequently and should hold enough details. In qualitative terms, feedback should be focused on performances that learners can control. Furthermore, feedback should be appropriate for the tasks learners are performing and should consider learners' understanding of what they should be doing. Moreover, Gibbs and Simpson (2004) argued that feedback should be received, attended to, and acted upon in such a way that learning becomes optimal. If learners perceive feedback in alignment with these conditions, their learning is supposed to be reinforced (Gibbs & Simpson, 2004).

6.1.3 Social presence

Social presence has its foundations in computer-mediated communication theories and is defined as "the degree of salience of the other person in the interaction and the consequent salience of the interpersonal relationships" (Short, Williams, & Christie, 1976, p. 65). Social presence can be viewed from a technological stance or from a social stance (Kreijns et al., 2011; Schrader & Bastiaens, 2012). Short et al. (1976) supported the technological stance, which stated that the level of social presence is established on characteristics of the online environment, such as the level of media richness. On the other hand, others, such as Gunawardena (1995), suggested that the online environment plays no part and that the level of social presence is determined by social factors.

These stances are extremes to one another. Spears, Postmes, Wolbert, Lea, and Rogers (2000) suggested that social presence is established on a combination of technological and social factors. Not only the size of a webcam shot influences the level of social presence, but also whether the person who is shown is familiar. Contrary, if strangers talk about a subject that you find interesting, your feelings of social presence rise. We assumed that social presence is based on both technological and social factors. In this study, social presence is defined as the feeling of being aware of the other person in such a way that the other person seems 'real' in the online communication (Kreijns et al., 2011).

Social presence is a prerequisite for social interaction (Tu, 2000; Tu & Mclsaac, 2002). In turn, social interaction lies at the heart of social learning and is regarded as a requirement for collaborative learning (Hiltz, 1994; Slavin, 1995). We conceptualized feedback processes as social interaction. In these interactions, coached teachers and peer coaches are admitted to the dimensions and peer coaches give elements (see Section 6.1.1). Moreover, social presence is believed to contribute to the success of learning experiences (Garrison, Anderson, & Archer, 2000). However,

research has not yet addressed the role of social presence in these kinds of online feedback and social interaction processes.

6.1.4 Research questions

The first research question focuses on the coherence of observed and perceived feedback and is formulated as follows:

1. To what extent do student teachers that receive effective feedback (i.e., as described in Section 6.1.1) perceive this as effective; and to what extent do student teachers that receive ineffective feedback perceive this as ineffective?

Based on a former study, in which teachers in primary education applied the same peer coaching program in face-to-face settings (Thurlings et al., in press; see also Chapter 5), it is hypothesized that student teachers who receive more effective feedback also perceive this to be of better quantity and quality than student teachers who receive less effective feedback. In addition, these student teachers are expected to perceive feedback to be of lesser quantity and quality.

The second and third research questions direct at the influence of social presence on perceived and observed feedback. These questions are formulated as follows:

2. How does social presence relate to perceived feedback?
3. How does social presence relate to observed feedback? And do perceptions of feedback corroborate with these findings?

It is expected that higher feelings of social presence lead to higher perceptions as well as more effective observed feedback.

6.2 METHODS

6.2.1 Context

An online peer coaching program was implemented. The online peer coaching program encompasses reciprocal peer coaching, videotaped lessons, solution-focused thinking, and a cyclic workflow consisting of two sessions. In the first session, goals are set and actions are formulated. In the second session, the performed actions are evaluated (Jeninga, 2003; see Section 1.4 for a detailed description). Peer groups usually consist of three student teachers and a process supervisor. These persons act as chairmen and model coaching behaviour using solution-focused thinking. The program aims to guide student teachers in improving their own teaching behaviours, for instance, being more consistent in applying classroom rules.

The peer coaching program was applied using Skype 4.1. This is a voice-over-IP program that allows phone calls over the Internet. Skype facilitates conversations among 15 participants. Users only need a headset with a microphone.

6.2.2 Participants

Sixteen student teachers from one Dutch teacher education institute participated (six males; 10 females). They engaged in internships at schools. The students were divided into five groups and each group was under the guidance of one process supervisor (another student teacher). Nine student teachers indicated their age in the questionnaires and their mean age was 47 years ($sd = 7$ years).

The student teachers have had another career and decided to become teachers. They followed a one year customized postgraduate teacher education course, which allows them, when graduated, to teach at the upper levels of secondary education. The course encompassed subjects on pedagogies and pedagogical content knowledge and internships. During these internships they were usually fully responsible for their subject. Some of the students got paid. As such, the student teachers functioned as in-service teachers; however, they only lacked a degree.

6.2.3 Instruments

6.2.3.1 Observations

To determine the quality and effectiveness of feedback, we used the Teacher Feedback Observation Scheme (TFOS; Thurlings et al., in press; Thurlings et al., 2012; see also Chapters 4 and 5). The TFOS' inter-rater reliability was shown to be substantial (Thurlings et al., 2012). The TFOS identified the four feedback dimensions and 12 feedback elements. The scoring of these dimensions and elements in each utterance of coached student teachers and their peer coaches was done using Excel and was equal to the scoring method in Chapter 5.

The procedure of scoring of the dimensions was executed as follows:

- When an utterance was completely goal-directed, we assigned a score of 4.
- When an utterance was completely non-goal/person-directed, we assigned a score of -4.
- When an utterance was balanced between goal-directedness and non-goal/person-directedness, we assigned a score of 0.
- Between these extremes (+4 and -4) and the zero-point, a +2 and a -2 can be assigned.

This method resembled a Likert-type scale and was also applied to the other dimensions. The dimensions were scored in every utterance, including that of the coached teachers.

The feedback elements were assigned either a 1 or a -1, when the element respectively was expected to be effective and ineffective. By assigning either a 1 or a -1, the elements were easily distinguished from the dimensions. The elements were scored if they occurred. Elements were mostly given by peer coaches, however, if coached teachers given an element, it was also scored.

6.2.3.2 Questionnaires

The questionnaire consisted of two parts. The first part aims to investigate how student teachers had perceived feedback, similar to the questionnaires applied in Chapter 5. To evaluate perceived feedback, three subscales of the Assessment Experience Questionnaire (AEQ) were used (Gibbs & Simpson, 2003). These subscales were chosen, because they are based upon Gibbs and Simpson's (2004) factors that support learning (see Section 6.1.2). The three subscales are *quantity of feedback* ($\alpha = 0.58$), *quality of feedback* ($\alpha = 0.70$), and *what you do with the feedback* ($\alpha = 0.70$). The alpha's are in alignment with other studies that utilized the AEQ (see for instance Segers et al., 2008). The items were adapted to fit the peer coaching program. Therefore, the respective numbers of the items of the scales were eight, six, and eight. The items were answered on a five-point scale.

The second part of the questionnaire aims to explore social presence (Short et al., 1976). The 21 items that assessed social presence were part of a pilot test that intended to develop a new questionnaire for determining the degree of social presence (Kreijns & Kirschner, in preparation). A sample item is: "I have the feeling of co-presence with my communication partners". The items yielded an α of 0.922 and were answered on a seven-point scale.

6.2.4 Procedure and data collection

The online peer coaching program was introduced to the students during a face-to-face meeting at their teacher education institute. In alignment with the lessons learned formulated in Chapter 3 (Section 3.5.1), this meeting elaborated the goals, skills, and attitudes that the peer coaching program intends. Furthermore, demonstrations and manuals were provided that explain uploading of video excerpts and communicating via Skype. In addition, the participants were allowed to contact the researchers with questions about the VIP procedure and technical issues. In consultation with the teacher educators, the process supervisors were chosen. These were student teachers that had a background in coaching. Finally, the peer coaching took

place in a synchronous online environment, which allows continuous and structured interaction.

To facilitate the peer coaching sessions, Skype was used. Two groups had one session and three groups held two sessions. These sessions were scheduled instead of face-to-face meetings at the teacher education institute in order to facilitate the participants (aligning with lessons learned in Section 3.5.1). Furthermore, the process supervisors joined the sessions so that they could fulfil their roles as intended.

The peer coaching sessions were recorded and transcribed. Subsequently, the TFOS was applied to the transcriptions. After the peer coaching sessions, the questionnaire was e-mailed to the students.

A complete set of data consists of a recorded peer coaching session and an accompanying completed questionnaire from one coached student teacher. Such a complete set was needed to be able to address the research questions. Ten complete sets of data of eight participants were collected and analysed.

6.2.5 Data-analysis

To answer the research questions, the data-analysis consisted of six successive steps. Below, these steps are explained and linked to the three research questions and the Results section. In the *first* step, the descriptives for the results of the Assessment Experience Questionnaire (AEQ) subscales were calculated. The descriptives of the AEQ subscales attend to each research question and are presented in Section 6.3.1.

In the *second* step, three benchmarks for effective observed feedback were established. These benchmarks were established in order to determine which participants received more effective feedback and which participants received less effective feedback compared to a standard (i.e., the benchmark). The standards of effective feedback were constructed based on the observations in the ten sets of data.

The first standard was called *dimensions* and included the average scores of the four feedback dimensions. The second standard was called *ratio of elements* and was the ratio of expected effective and expected ineffective feedback elements – expressed in percentages. The third standard was called *ratio of effectiveness* and expressed (a) the ratio of effectiveness of expected effective elements and (b) the ratio of expected ineffective elements – both in percentages.

To determine these ratios, timeline graphics depicting the dimensions and elements were created (see also Section 5.2.7). The scoring of the dimensions as well as the elements was chronologically shown on these timeline graphics. The effectiveness of each feedback element (e.g., guiding questions, summarizing, and judging) was determined by comparing the positions of the dimensions on the timeline graphic in the utterances before and after the element occurred. If the dimensions were higher after the element than before, the element was counted as effective. If

the dimensions were equal to or lower than before the element occurred, the element was counted as ineffective. By adding up the effectiveness of the elements, separately for expected effective and expected ineffective elements, the ratios of effectiveness were calculated.

The difference between the second and third standards of effective feedback is that the second standard addressed the amount of feedback elements whereas the third standard attended to the effect of the elements on the dimensions. The results of the standards are presented in Section 6.3.1 and contribute to the first and third research questions.

In the *third* step, a case ordered descriptive meta-matrix (Miles & Huberman, 1994) was constructed. The meta-matrix was constructed based on the scores on the AEQ subscales and depicted participants' individual scores on the questionnaire starting with the lower than average scores and ending with the higher than average scores.

The meta-matrix was then supplemented with participants' individual scores of the observed feedback compared to standards of effective feedback. These individual scores were expressed in /L/ (lower than the standard), /A/ (average), and /H/ (higher than the standard) and were filled in the cross case descriptive meta-matrix. This method provided insights into the effectiveness of each participant's observed feedback compared to the whole research group.

In other words, the first and second step of the data-analysis were combined into the meta-matrix (third step), which together address the first research question. In order to answer this research question, it was explored whether the meta-matrix could be broken down into groups of similar data. The results of this matrix are presented in Section 6.3.1.

The *fourth* step investigated whether feedback perceptions relate to the standards of effective feedback. Non parametric Spearman correlation coefficients were calculated (Field, 2005). These results are presented in Section 6.3.1 and contribute to the first research question. These four steps combined provide an answer to the first research question.

The *fifth* step examined whether social presence relates to feedback perceptions and to the standards of effective feedback. Non parametric Spearman correlation coefficients were calculated (Field, 2005). These results are presented in Sections 6.3.2 (perceptions) and 6.3.3 (standards) and address the second and third research questions respectively.

In the *sixth* step, another case ordered descriptive meta-matrix was constructed (Miles & Huberman, 1994). This meta-matrix included the scores on the AEQ subscales, the social presence scale, and participants' individual scores compared to the three standards of effective feedback. In order to answer the third research question, it was explored whether the meta-matrix could be broken down into groups of

similar data. This matrix is presented in Section 6.3.3 and contributes to the third research question.

6.3 RESULTS

6.3.1 Research question 1: Coherence of perceived and received feedback

This section first addresses the descriptives of the AEQ and, secondly, sets the standards for effective observed feedback. Thirdly, the results of the cross case descriptive meta-matrix and Spearman correlations are presented.

Table 6.1 shows the descriptives for perceived feedback. The table shows that student teachers perceived feedback of good quantity and quality. In addition, they generally intended to do something with the feedback they received.

Table 6.1 The descriptives of AEQ subscales (n = 10)

AEQ	M	sd	Minimum	Maximum
Quantity of feedback	4.18	0.39	3.50	4.75
Quality of feedback	4.30	0.65	3.17	5.00
What you do with feedback	4.41	0.77	2.38	4.88

Table 6.2 shows the descriptives for the standard dimensions. The table shows that the dimensions were not pronouncedly high. Feedback was mostly goal-directed, though not very specific. Also, feedback was detailed for a fair amount and mostly formulated in a neutral manner.

Table 6.2 The descriptives of feedback dimensions (n_{utterances} = 966)

Dimensions	M	sd	Minimum	Maximum
Goal- vs. non-goal/person-directedness	1.53	0.70	0.65	2.53
Specific vs. general	0.48	0.40	-0.17	1.11
Detailed vs. non-detailed	0.95	0.51	0.34	1.40
Positive vs. negative	0.11	0.15	0.00	0.58

In the 922 utterances spoken in all coaching sessions, 511 expected effective feedback elements and 187 expected ineffective elements were observed. Consequently, the standard ratio of elements was 73–27%.

Concerning the standard ratio of effectiveness, of all expected effective elements 44% were indeed effective and 56% were not. Of all expected ineffective elements 30% were effective and 70% were indeed ineffective.

Table 6.3 shows the first case ordered descriptive meta-matrix that addressed the coherence between perceived and received feedback. Note that the sequence

of cases was made based on the AEQ, starting with the lower than average perceptions and ending with the higher than average perceptions. The individual scores on the ratio of elements and ratios of effectiveness seemed to follow the perceptions of feedback. More specifically, the list discerned three groups, and therefore, the list was broken down at two points.

Table 6.3 Results of the first cross case meta-matrix

Cases	AEQ			Standard Dimensions				Standard Ratio of elements	Standard Ratio of effectiveness	
	Quantity	Quality	What students do with feedback	Goal vs. non-goal directed	Specific vs. general	Detailed vs. non-detailed	Positive vs. negative	Expected effective vs. expected ineffective elements	Real effectiveness of expected effective elements	Real effectiveness of expected ineffective elements
Douglas	L	L	L	H	H	H	A	L	L	L
Liza	L	A	L	H	H	H	L	L	A	L
Thomas	L	L	H	H	H	H	L	L	A	H
Lauren	A	L	A	L	L	l/a	L	H	L	A
Dean	A	H	A	L	L	H	A	L	A	A
Amy2 ^a	L	H	H	H	H	h/a	H	A	L	L
Amy1	H	L	H	L	L	L	L	H	L	L
Karin2 ^a	A	H	H	H	H	H	L	H	H	A
Mary ^b	H	H	H	L	H	L	A	H	A	L
Karin1 ^a	H	H	H	H	H	h/a	L	H	H	H

Note. /L/ = lower than the standard, /A/ = average, /H/ = higher than the standard

a. Amy and Karin had two sessions and completed the questionnaire after both sessions

b. Mary did not receive any expected ineffective elements

The first breakpoint was between Amy’s second and her first session, where the ratio of elements changed from lower than average or average to higher than average. The second breakpoint was between Amy’s first and Karin’s second session. Not only the ratio of elements was more effective, but also the ratios of effectiveness were.

Thus, these findings indicate that participants who received more effective feedback, for instance Karin, also perceived feedback to be more effective than participants who received less effective feedback, for instance Douglas, who also perceived feedback to be less effective. However, the scores on the dimensions

were fuzzy and seemed to not corroborate with these findings. The Spearman correlation coefficients provided several nuances.

Spearman correlation coefficients were calculated in order to further investigate relationships between the observation and questionnaire findings. Only significant correlations at p -value < 0.10 are presented. First, the ratio of elements correlated significantly with perceptions of feedback quantity ($r_s = 0.869$, $p = 0.001$). This indicated that if more expected effective elements were provided, the student teachers also perceived feedback of better quantity. Moreover, the dimension of details correlated with the ratio of elements ($r_s = -0.842$, $p = 0.002$) and perceived quantity ($r_s = -0.771$, $p = 0.009$). This indicated that fewer details were discussed, if more expected effective elements were given and feedback was experienced as of better quantity. Third, the ratio of effectiveness of expected effective elements and perceived quality of feedback correlated significantly ($r_s = 0.554$, $p = 0.097$). This implied that if more expected effective elements turned out effective, feedback was also perceived as of better quality. Finally, the ratio of effectiveness of expected effective elements correlated significantly with the dimension of specificity ($r_s = 0.571$, $p = 0.084$). Also, the ratio of effectiveness of expected effective elements correlated significantly with the dimension positivity ($r_s = -0.711$, $p = 0.021$), indicating that feedback was formulated in a more neutral manner when the ratio of effectiveness of expected effective elements was higher.

6.3.2 Research question 2: Social presence and feedback perceptions

Table 6.4 shows the Spearman correlation coefficients and their one tailed p -values for social presence and feedback perceptions. Social presence ($m = 5.34$; $sd = 0.65$) correlated negatively with perceptions, and in addition, social presence and perceptions of feedback quantity correlated significantly ($r_s = -0.508$, $p = 0.067$). This implied that higher feelings of social presence did not lead to higher perceptions. These findings contradicted the expectations.

Table 6.4 Spearman's correlation coefficients and their p -values ($n = 10$)

Correlations	Social presence
Quantity of feedback	-0.508 (0.067*)
Quality of feedback	-0.116 (0.375)
What students do with feedback	-0.080 (0.413)

* Significant at 0.10

A thorough analysis of Spearman's correlations at the item level provided a more nuanced view. Higher feelings of the other person's presence, for instance, led stu-

dent teachers to be more inclined to listen to feedback, they thought that feedback was given in time, and they felt more support to improve and reflect on the formulation of their goals and actions. In addition, if student teachers thought that they were present in the perception of the others, they were more willing to improve their actions. These findings were in alignment with the expectations.

An exception to these findings was that if student teachers thought the others could *feel* their presence, the feedback perceptions became lower. Maybe, *feeling* their presence crossed a border, suggesting that the student teachers felt as if the others were too close, instead of keeping a certain distance.

Other correlations at the item level showed that if student teachers felt nobody was listening, they did not feel supported and felt feedback that supports to improve their actions lacked. These findings supported the expectations, yet, they took a reversed perspective: lower feelings of social presence led to lower feedback perceptions.

Some examples of these significant correlations are provided in Table 6.5. The first two rows show the findings that were in alignment with the expectations, the third row addresses the exception, and the final row attends the reversed findings.

Thus, social presence influenced feedback perceptions; however, the item analyses show that it is necessary to make nuances.

Table 6.5 Examples of significant Spearman's correlation coefficient at the item level of the AEQ subscales and the social presence scale (n = 10)

Item social presence	Item AEQ	Spearman's correlation coefficient
I feel that my communicating partners are 'real' physical persons.	Whatever feedback I get comes too late to be useful.	0.648*
I think that my communication partners feel that I am a 'real' physical person.	The feedback does not help me to formulate new goals.	0.648*
I think that my communication partners can <i>feel</i> my presence.	The feedback comes back very quickly.	-0.679*
I feel that my messages are absorbed in a huge empty space.	If my learning goal is not formulated specifically enough, I don't receive much guidance in what to do about it.	-0.714*

Note. Negatively formulated items were reversed before correlations were calculated.

* Significant at 0.05.

6.3.3 Research question 3: Coherence of social presence, perceptions, and observed feedback

Table 6.6 shows the second meta-matrix that incorporates social presence, feedback perceptions, and the participants' individual scores compared to the standards for received feedback. The order of cases resembles that of Table 6.3. This is based upon Table 6.4, which showed that social presence correlated negatively with per-

ceptions of feedback. Furthermore, social presence correlated negatively significantly with the ratio of elements ($r_s = -0.600, p = 0.067$). This implied that if higher feelings of social presence were experienced, less expected effective elements were given. Table 6.6 shows that participants that had higher than average feelings of social presence are at the lower half of the list and that participants that had lower than average feelings of social presence are on the upper half of the list.

Table 6.6 Results of the second cross case descriptive meta-matrix

Cases	AEQ			Standard Dimensions					Standard Ratio of elements	Standard Ratio of effectiveness	
	Social presence	Quantity	Quality	What students do with feedback	Goal vs. non-goal directed	Specific vs. general	Detailed vs. non-detailed	Positive vs. negative	Expected effective vs. expected ineffective elements	Real effectiveness of expected effective elements	Real effectiveness of expected ineffective elements
Douglas	L	L	L	L	H	H	H	A	L	L	L
Liza	H	L	A	L	H	H	H	L	H	A	L
Dean	H	A	H	A	L	L	H	A	L	A	A
Thomas	H	L	L	H	H	H	H	L	L	A	H
Amy2 ^a	H	L	H	H	H	H	h/a	H	A	L	L
Lauren	H	A	L	A	L	L	l/a	A	H	L	A
Amy1	A	H	L	H	L	L	L	L	H	L	L
Karin2 ^a	L	A	H	H	H	H	H	L	H	H	A
Karin 1 ^a	L	H	H	H	H	H	h/a	L	H	H	H
Mary ^b	L	H	H	H	L	H	L	A	H	A	L

Note. /L/ = lower than the standard, /A/ = average, /H/ = higher than the standard

a. Amy and Karin had two sessions and completed the questionnaire after both sessions

b. Mary did not receive any expected ineffective elements

This list was also broken down at two points that discern three groups. The first breakpoint was between Amy’s second session and Lauren, where the ratio of elements changed from lower than average or average to higher than average. The second breakpoint was between Amy’s first and Karin’s second session, where the standard ratio of effectiveness changed from lower than average or average to higher than average. Similar to the findings of Table 6.3, the dimensions seemed to not corroborate with the other findings.

Thus, social presence relates negatively to observed feedback: if higher feelings of social presence were perceived, the ratio of elements and ratios of effectiveness were lower than average. Similar to the findings described in Section 6.3.1, the ratio of elements and ratios of effectiveness corroborates with the perceptions.

6.4 DISCUSSION

In this study, we focused on the interplay of observed and perceived feedback and the influence of feelings of social presence. In a naturalistic setting, student teachers engaging in synchronous online peer coaching were observed and they filled in questionnaires about their perceptions of given feedback and social presence.

The finding that perceived feedback corroborates with observed feedback was also found in a former study (Thurlings et al., in press; see also Chapter 5), in which 12 primary school teachers applied the same peer coaching program, yet in face-to-face settings. In both studies, participants who received more effective feedback also perceived it to be of better quantity and quality than participants who received less effective feedback. In turn, participants who received less effective feedback perceived it to be of lesser quantity and quality. Therefore, the hypothesis of the first research question is confirmed.

In the recent study, the results of the feedback dimensions did not align with this finding. The study in Chapter 5 did not address the dimensions in relation to the coherence of observed and perceived feedback. In both studies, elements, such as open-ended questions and summarizing, seemed to have more effect on perceptions than feedback dimensions. Elements were mostly given by others whereas receivers were admitted into the dimensions. Probably, elements are experienced as an impulse, which receivers can experience as either positive or negative. These impulses influence feedback perceptions.

Because earlier research showed that perceptions of feedback have an effect on learning (Gibbs & Simpson, 2004; Scouller, 1998), learning by our participants, who received more effective feedback and who perceived this feedback as of better quantity and quality, would have been more optimal. Moreover, these results are confirmed by the significant non-parametric Spearman correlations between perceived quantity of feedback and the ratio of elements and between perceived quality of feedback and the ratio of effectiveness of expected effective elements.

The finding that social presence relates negatively to feedback perceptions contradicted the expectations and the hypothesis should have been rejected. However, a closer examination of correlations at the item level demonstrated a more nuanced view. When participants felt the others were present and felt these others felt their own presence, they were more inclined to listen and reconsider their actions, and they felt more support. The opposite was also found: If participants felt as if nobody

was listening, they did not feel supported and they perceived less feedback was given. These results imply that the social presence scale holds different subscales, which should be treated as such in the data analysis. Due to a small sample, techniques like factor analysis could not be performed and a larger sample is needed.

Both cross case meta-matrices discerned three groups based on break points. The break points in both meta-matrices were equal: the ratio of elements and the ratios of effectiveness became above the standard. These findings show that it is not only important to give more expected effective elements than expected ineffective elements, but also that these are really effective and that if expected ineffective elements are given, they somehow need to strengthen the dimensions too (see also Sections 5.4 and 5.4.1).

Furthermore, when teachers give each other feedback, it is important that they ask open-ended and solution-focused questions, use continuous questioning after summarizing, and avoid hinting, judging, finishing sentences, and telling from one's own experience. Consequently, feedback becomes a dialogue (see also Licklider, 1995), where teachers acknowledge, respect, and listen to each other. When implementing the peer coaching program as intended, effective feedback seems guaranteed, because the program provides for these opportunities.

Because research on online learning had not yet addressed the effects of feedback, especially in teacher professional development, our study offers valuable insights on feedback processes in these activities. Moreover, this study suggests that teacher professional development activities can be reinforced by applying ICT tools.

Future research could investigate (a) why certain feedback elements turn out effective or not, (b) the role of social presence in online feedback processes among (student) teachers, (c) whether feedback processes in other types of (online) coaching develop similarly to the ones found in this study, and (d) learning outcomes of the peer coaching program and relate these to feedback processes.

One conclusion is that coherence of feedback observations and feedback perceptions exists in synchronous online peer coaching. Second, feedback elements have more effect on feedback perceptions than feedback dimensions have on the perceptions. In addition, social presence influences these feedback processes; however, the social presence scale was part of a pilot test and needs further validation so that more profound claims can be made. Finally, the findings disclose many opportunities for online learning and online teacher professional development. The advantages of applying ICT tools, that is, time and place independency, close to the workplace, learning from external coaches, and functioning as a community of practice, can therefore be fully exploited by teachers and other learners.

Chapter 7

General discussion

7.1 INTRODUCTION

This dissertation has shown that feedback among teachers supports them in their professional development activities. Feedback was approached as a multi-dimensional process. A peer coaching program, namely the Video Intervention Peer coaching procedure (VIP; Jeninga, 2003), was implemented in three different conditions. These conditions were asynchronous online, face-to-face, and synchronous online.

The main aim was to examine feedback processes among teachers in face-to-face and online peer coaching (i.e., the VIP procedure) as part of their professional development. Seven research questions were formulated (see Chapter 1, Section 1.6), that for the sake of clarity are clustered in three main themes and these are addressed as such in this chapter: (a) review perspective on feedback theory (Section 7.1.1), (b) design perspective (Section 7.1.2), and (c) integrated discussion of effective feedback (Section 7.1.3). Subsequently, strengths and limitations are addressed (Section 7.2). Finally, suggestions for future research (Section 7.3) and implications for practice (Section 7.4) are described.

7.1.1 Review perspective on feedback theory

The systematic literature review (Chapter 2) provided insights into effective feedback characteristics and processes. These characteristics and processes largely depend on learning theories from which learners are facilitated. Feedback processes in behaviourism and cognitivism are straightforward, in contrast to feedback processes in social constructivism and the cognitive apprenticeship method, where feedback processes are complicated and many factors influence and mediate the process. While the reviewed studies reasoning from behaviourism and cognitivism reflect the straightforward processes, reviewed studies from social constructivism and the cognitive apprenticeship method do not always acknowledge the complexity of learning processes.

Recently, Dysthe, Lillejord, Wasson, and Vines (2011) distinguished two models of electronic feedback (e-feedback): (a) an authoritative model, which reflects the traditional transmission view of education, in which “the teacher ‘owns’ the knowledge and the student receives it” (p. 244; quotation marks are original) and (b) based on Vygotsy’s ideas, a dialogical model, which is primarily horizontal and where new knowledge emerges from dialogue. Dysthe et al. (2011) suggested that “students in higher education in the dialogical model benefit from being exposed to divergent voices and conflicting perspectives” (p. 254). The e-feedback in such an environment supports the transition of these divergent voices and conflicting perspectives. Whereas most reviewed studies from Chapter 2 seem to have followed the authoritative model, this dissertation follows the dialogical model. In our studies, teachers were not obliged to tackle certain teaching behaviours and to execute

certain actions, but were coached by multiple peers and were allowed to find their own solutions and actions, which fitted them best.

The systematic literature review (Chapter 2) also provided indications for effective feedback among teachers. The review shows that studies mostly focused on the perceptions of the teachers or manipulated feedback to reach a certain outcome. No reviewed study observed feedback processes among teachers.

The aim of this dissertation was to investigate peer-to-peer feedback processes among teachers from social constructivism and cognitive apprenticeship method and tried to do so by applying a multidimensional approach to feedback processes. In this approach, five dimensions of feedback were distinguished: (a) goal-directedness vs. non-goal-directedness, (b) specific vs. general, (c) detailed vs. non-detailed, (d) corrective vs. non-corrective, and (e) positive vs. negative. These five dimensions were synthesized from several studies that focused on feedback to students and feedback to teachers (see Chapter 2 and Section 4.1.1). Based on these reviewed studies, it was assumed that goal-directed, specific, detailed, corrective, and neutral feedback is effective and that non-goal-directed, general, non-detailed, and non-corrective feedback that is either too positive or too negative is not effective. Feedback was also operationalized in feedback elements, such as open-ended and continuous questions and hints.

The studies described in Chapters 5 and 6 showed that this theoretical operationalization of feedback corroborates with teachers' perceptions of feedback. If feedback was determined to be effective from a literature perspective, this feedback was also perceived as more effective. Vice versa, feedback that was determined to be ineffective was perceived as less effective. This finding supports the theoretical notions of what effective feedback is. Thus, even though hardly any research has investigated feedback processes between teachers, research findings on feedback from teachers to students are applicable to feedback processes between teachers. In other words, the same kinds of feedback characteristics are effective in teacher professional development as in student learning.

Findings from Chapters 5 and 6 also indicated that teachers generally were positive about the feedback they received. This aligns with earlier findings of Goodnough, Osmond, Dibbon, Glassman, & Stevens (2009), Yang and Liu (2004), and Sharpe et al. (2003), who conducted studies on feedback perceptions in online environments and also concluded that (student) teachers are positive about the feedback they received.

Three former studies also used social constructivistic or cognitive apprenticeship point of view (Landry, Anthony, Swank, & Monseque-Bailey, 2009; Licklider, 1995; Scheeler et al., 2004). Landry et al. (2009) and Licklider (1995) drew similar conclusions: mentoring respectively peer coaching are appropriate situations for teacher professional development. However, Landry et al. (2009) and Licklider (1995) did not report on what happened during these mentoring or peer coaching

meetings. In contrast, our studies examined feedback processes in peer coaching sessions and perceptions of that received feedback. Essentially, the dissertation contributes at Licklider's (1995) and Landry et al.'s (2009) by exploring what happened during peer coaching sessions.

Scheeler et al. (2004) concluded in their review on performance feedback to teachers that "(a) feedback is better than no feedback, (b) immediate feedback is better than delayed feedback, and (c) feedback that is immediate, specific, positive, and corrective holds the most promise for bringing about lasting change in teaching behaviour" (p. 68). This dissertation has shown that feedback that is goal-directed, specific, detailed, and neutral (neither positive nor negative) is effective and that feedback that is non-goal-directed, vague, non-detailed, and either too positive or too negative is ineffective. In addition, open-ended, solution-focused, and guiding questions and continuous questioning were shown to positively affect feedback. Hinting, judging, closed questions, finishing sentences, and providing an example from one's own classroom or experience were shown to negatively affect feedback. Furthermore, acknowledging and continuous questioning after summarizing seem to have a positive influence.

Moreover, several elements of the peer coaching program are likely to change teaching behaviours. First, the program was shown to be a practical realization of *Visible Learning* (Hattie, 2009; see Chapter 4). Second, video excerpts of teachers' own teaching behaviours were used, that, in a recent study of Seidel, Stürmer, Blomberg, Kobarg, and Schwindt (2011), were shown to have a positive effect on noticing and to support teachers to have an active experience. Third, reciprocal peer coaching is considered to reinforce changing teacher behaviours (Ackland, 1991; Bowman & McCormick, 2000; Bruce & Ross, 2006; Showers, 1985).

Our studies show that feedback is a complex process because of many confounding variables. The receivers' characteristics, interpretations, and perceptions, the feedback message, the providers, and so forth all play a part. This dissertation attempted to provide insights into this complex processes by taking a multidimensional perspective on feedback and examining teachers' perceptions. It contributes to the main part of feedback processes, namely the interaction between receivers, providers, and feedback messages. Based upon the findings from the studies, it can be concluded that teacher professional development can be reinforced if situations that allow teachers to give feedback such as peer coaching are more systematically implemented in schools.

7.1.2 Design perspective

In Chapter 4, the development of an observational instrument was addressed. This Teacher Feedback Observation Scheme (TFOS) was developed based upon findings from Chapter 2. The TFOS distinguished five feedback dimensions and several feed-

back elements (see Section 4.1.3). In Chapter 4, the TFOS was pilot tested and the inter-rater reliability of the dimensions and elements was established. Based on this study's experiences, the TFOS was modified. The dimensions and elements were adapted in three ways.

First, the dimension *corrective vs. non-corrective* had to be deleted because corrective feedback does not align with what the VIP procedure intends: to use solution-focused thinking in order to guide coached teachers to find their solutions to their problematic teaching behaviours. Corrective feedback generally means that providers tell receivers what to do (Goodman, Brady, Duffy, Scott, & Pollard, 2008; Scheeler et al., 2004). As a probable consequence of this definition, the dimension hardly occurred during the sessions that were analysed in Chapter 4.

Second, the element *clarifying questions* had to be assimilated into the element *continuous questioning*, because both elements ask for additional information on a given subject. The coding scheme that explains the definitions of each dimension and element was adapted in such a way that *continuous questioning* would also allow for scoring clarifying questions.

Third, the elements *summarizing*, *acknowledging*, *finishing sentences*, and *providing an example from one's own classroom or experience* had to be included. These elements frequently occurred in the peer coaching sessions that were analysed in Chapter 4. This inclusion was done because it was likely that these elements would occur in other VIP sessions as well and consequently they might influence the process. Including these elements made it possible to examine their influence.

Another adaption of the TFOS was that the influence of each element on the dimensions was determined by using timeline graphics (see Sections 5.2.7 and 6.2.5). This adjustment of the TFOS made it possible to scrutinize each element and its influence, which was not the case in Chapter 4, where larger chunks of the sessions were summarized into effective and ineffective patterns of feedback. In addition, the timeline graphics made it possible to reveal how much and which feedback elements were effective or not. If the TFOS would be further developed, the analysis method from Chapter 4 might be incorporated into that from Chapters 5 and 6. In other words, it could be examined what the influence of a combination of the elements is in larger chunks of the peer coaching conversations.

The final adaption of the TFOS was the inclusion of questionnaires and interviews to study the participants' perceptions of received feedback. Consequently, it could be explored if coherence between observed and perceived feedback existed. Perceived feedback has been examined in many other studies (see Chapter 2) and is believed to influence perceived learning (Gibbs & Simpson, 2004; Scouler, 1998; Segers, Gijbels, & Thurlings, 2008). The questionnaires used Likert-type questions and the interview was semi-structured. As such, the perceptions of the participants were explored both quantitatively (i.e., by means of the questionnaire) and qualita-

tively (i.e., the interview). The adapted TFOS was implemented in the studies in Chapters 5 and 6.

The TFOS includes elements that were observable, and as a consequence, characteristics of feedback such as sufficient, credible or constructive are not included. However, such characteristics are considered to influence the process (See Chapter 2), yet, we believe they function more within the perception of the receiver than within the feedback message. Therefore, it was decided to include the questionnaire into the TFOS. By applying mixed methods, we were able to investigate feedback processes from several viewpoints. In future research, it would be worthwhile to consider elements that can not be observed and to include these kinds of elements in a questionnaire or a stimulated recall interview. In such an interview, the video or audio is played back to the participant and the interviewer can ask specific questions to unravel the participants' thoughts at the moment the feedback was given (Fox-Turnbull, 2009).

A concomitant symptom of the TFOS is that it takes time: the sessions need to be transcribed, the transcriptions need to be coded, the timeline graphics need to be made and examined, and the questionnaires and interviews need to be analysed. However, our findings show that this time was worthwhile.

7.1.3 Integrated discussion of effective feedback

Four empirical studies were conducted, in which groups of teachers were observed who participated in a peer coaching program: the Video Intervention Peer coaching procedure (VIP; Jeninga, 2003; see Section 1.4). The VIP procedure is based upon solution-focused thinking (Jackson & McKergow, 2002) and implements reciprocal peer coaching in a peer group of three teachers. Video recordings of their own classes are used, which was recently shown to have a more positive effect on noticing and to support teachers to have a more activating experience than watching another teacher's video (Seidel et al., 2011). The VIP procedure applies a cyclic workflow, which incorporates a *Plan Do Check Act* cycle (PDCA; Deming, 2000) that consists of two sessions. In the first session, the goal of each teacher and the accompanying actions are formulated. In the second session, the executed actions are evaluated. The peer groups are joined by a process supervisor, who chairs the sessions, reflects explicitly on the coaching behaviours of the teachers, and can interrupt if the coaching no longer is in alignment with the procedure's intentions.

Each study was conducted in a naturalistic setting. The settings differed from asynchronous online (Chapter 3), to face-to-face (Chapters 4 and 5), and to synchronous online (Chapter 6). Table 7.1 provides a summary of the individual studies.

Table 7.1 Summary of findings from each study

		Chapter 3	Chapter 4	Chapter 5	Chapter 6
Setting	Asynchronous online	x			
	Face-to-face Synchronous online		x	x	x
Participants		3 teachers	12 teachers	12 teachers	16 student teachers
		Special education	Secondary education	Primary education	Secondary education
Methods	Observations	x	x	x	x
	Questionnaires			x	x
	Interviews	x		x	
Major results		-Lack of interaction: time, motivation, skills, and attitude -Lessons learned	-Validated TFOS -Effective feedback patterns -Ineffective feedback patterns and how to transition to effective patterns -Role of process supervisor	-Coherence of observed and perceived feedback -74% of all elements expected to be effective -40% expected effective elements indeed effective -33% expected ineffective elements effective	-Coherence of observed and perceived feedback -73% of all elements expected to be effective -44% expected effective elements indeed effective -30% expected ineffective elements effective -Social presence influences feedback processes

This section (Section 7.1.3) integrates the findings of the studies by arranging them into four topics: asynchronous online, synchronous, written, and oral feedback (Section 7.1.3.1), patterns of feedback (Section 7.1.3.2), social presence (Section 7.1.3.3), and process supervisors (Section 7.1.3.4).

7.1.3.1 Asynchronous, synchronous, written, and oral feedback

The study described in Chapter 3 showed that asynchronous online interaction is influenced by many factors, such as a lack of time and required technical skills. Because hardly any interaction occurred, it was almost impossible to observe feedback

processes. However, the interviews provided insights into what factors determine this lack of interaction, which was summarized into several lessons learned.

These lessons learned (see Section 3.5.1) were incorporated into the study described in Chapter 6. Especially implementing a synchronous communication tool instead of an asynchronous online tool ensured that the interaction between the participating student teachers became continuous and structured, which allowed to observe the feedback processes. The study described in Chapter 6 shows that online synchronous feedback is promising, which contrasts the findings of Chapter 3.

Bernard et al. (2004) concluded in their meta-analysis on (a)synchronous distance education and classroom learning that synchronous distance education yields higher learning outcomes than asynchronous distance education. In addition, students generally prefer classroom learning to distance education. Moreover, drop-out rates in asynchronous distance education are larger than drop-out rates in synchronous distance education. Similarly, Ocker and Yaverbaum (1999) showed that learning outcomes in asynchronous learning are equal to face-to-face learning, yet participants in the face-to-face groups are more satisfied with the processes than participants in the asynchronous groups. Findings from Chapters 3 and 6 concur with Bernard et al.'s (2004) and Ocker and Yaverbaum's (1999) conclusions: feedback processes are more effective in the synchronous settings, and in addition, participants from the study described in Chapter 3 all preferred face-to-face coaching above online coaching.

Despite the finding that synchronous learning is more effective than asynchronous learning (Bernard et al., 2004), many advantages of asynchronous learning are reported. For instance, Watt, Walther, and Nowak (2002) mentioned the advantages of "store-and-forward capacity" (p. 2), membership from all over the world, and members are able to thoroughly think through their messages (see also Im & Lee, 2003; Lapadat, 2002). Lapadat (2002) added that in asynchronous discussions everybody can contribute and messages are more to the point.

On the other hand, Yang and Liu (2004), Holmes (2004), and Lapadat (2002) acknowledged that asynchronous discussions need to be supported, which corresponds with the findings from Chapter 3. Yang and Liu (2004) suggested that time, effort, support, and initiative are necessary for successful asynchronous discussions. Holmes (2004) indicated that ill-structured tasks and the presence of an instructor support to discuss asynchronously. Lapadat (2002) proposed that clear purposes, a safe online environment, and provoking higher order skills are elements of successful asynchronous discussions. Several of these suggestions are incorporated into Chapter 3's lessons learned (Section 3.5.1).

Another difference between the settings was that the feedback was *written* (Chapter 3) or *orally* delivered (Chapters 4, 5, and 6). Five studies from the review (Chapter 2) focused on written, oral, and/or e-feedback. First, Kluger and DeNisi (1996), reasoning from cognitivism, suggested that oral feedback reduces the ef-

fects of Feedback Interventions, because oral feedback tends to direct at meta task processes. Their Feedback Intervention Model indicated that feedback on task learning processes is more effective than feedback on task motivation and meta task processes, because feedback on task learning levels aims more directly on the tasks at hand. Following Kluger and DeNisi's findings, the learning outcomes for the participants in Chapter 3 would have been more beneficial than for our other participants. However, our studies were all conducted from a social constructivistic and cognitive apprenticeship point of view, and these learning theories envision different learning and feedback processes than cognitivism (see Chapter 2). Moreover, most feedback was goal-directed and not focused on meta task processes.

Four other studies explored written, oral and/or e-feedback in the context of online language education (Hyland, 2001; Morra & Asis, 2009; Tuzi, 2001, 2004; Weaver, 2006). Tuzi (2001, 2004) listed differences between oral and e-feedback. Oral feedback gives pressure to respond quickly; e-feedback does not provide such pressure. Oral feedback conveys non verbal cues; e-feedback does not (see also Walther & Tidwell, 1995). Oral feedback is more personally intrusive and creates a greater sense of involvement, while e-feedback is more distant and has a greater sense of anonymity. Finally, oral feedback provides an opportunity to negotiate meaning and e-feedback in online settings does not provide this opportunity (see also Weaver, 2006). In Weaver's study (2006), misunderstandings of written feedback easily arose, because feedback was too vague or too general. Similarly, several misunderstandings indeed arose in the coaching processes described in Chapter 3 (see Section 3.4.1.3). Moreover, the results of Chapter 4 showed that the given feedback in the virtual group was mostly ineffective (see Section 4.3.2). In addition, the participating students in Weaver's (2006) research pointed out that they sometimes did not fully understand often used expressions in written feedback. Hyland (2001) and Morra and Asis (2009) showed that students often work individually and are reluctant to contact their tutors. Moreover, students in Morra and Asis' (2009) study who received on tape feedback argued that they felt less distant to their teachers. In our studies, the participants in Chapter 3 seemed to be working on their own; indeed, there was hardly interaction between them. Based upon these findings, it can be concluded that oral (face-to-face and synchronous online) feedback is more effective for learning processes than written asynchronous feedback and that if written asynchronous feedback needs to be effective, recommendations of this and other research must be implemented, such as a training on writing online messages.

7.1.3.2 Patterns of feedback

The studies described in Chapters 4, 5, and 6 explored how the feedback elements (e.g., open-ended and guiding questions, hinting) affected the feedback dimensions

(i.e., goal-directed vs. non-goal-directed; specific vs. general; detailed vs. non-detailed; corrective vs. non-corrective; positive vs. negative). Chapter 4 focused on patterns of feedback elements that influenced the feedback dimensions. Both effective and ineffective patterns were studied. Regarding the ineffective patterns, it was investigated if and how these were turned into effective patterns. In most cases, the ineffective patterns were turned into effective patterns by peer coaches, the process supervisor, or coached teachers themselves. On the other hand, findings from Chapters 5 and 6 showed that in most cases the expected ineffective elements were indeed ineffective (67 – 70%). However, a major difference between these studies is that in Chapter 4 larger chunks of the coaching conversations were analysed, whereas in Chapters 5 and 6 the influence of each element in a smaller chunk of the conversation was studied.

Chapters 5 and 6 examined how each feedback element influenced the feedback dimensions. Because we used about the same methodology in Chapters 5 and 6, the ratio of feedback elements and ratio of effectiveness can be compared. Table 7.1 shows that the findings on the ratio of feedback elements (74 – 73%) and ratios of effectiveness (40 – 44%; 33 – 30%) were similar. It seems a coincidence that about three-quarters of given feedback elements are expected to be effective, that about two-third of given expected effective feedback elements are indeed effective, and that about one-third of given expected ineffective feedback elements are effective. This implies that feedback providers should try again to encourage feedback receivers to become more goal-directed, specific, detailed, and neutral, which in turn leads to higher perceptions of feedback and presumably better learning outcomes. Thus, the effectiveness of feedback seems to depend on patterns rather than on one dimensional aspects. Chapters 4, 5, and 6 have shown that patterns of feedback emerge in different settings. In Chapter 3, in the asynchronous online environment, such patterns did not emerge, which was caused by lack of interaction. This conclusion suggests that it does not matter if the first time around feedback receivers do not become more goal-directed, specific, detailed, and neutral after feedback providers phrase expected effective feedback elements. Such a distribution may further be examined by conducting Markov chains (see Section 7.3 for a further elaboration).

Giving feedback does not only mean that specific feedback elements should be phrased. An attitude of respect to the receivers is necessary and receivers should be open minded to the feedback to come (Luft, 1969). It may well be that such an attitude and certain feedback elements influence each other reciprocally: if feedback providers and receivers have such an attitude, the right feedback elements will follow and if the appropriate elements are given, providers and receivers adopt such an attitude.

7.1.3.3 *Social presence*

Chapter 6 focused on social presence (Short, Williams, & Christie, 1976). Social presence is believed to influence social interaction and learning (Tu, 2000; Tu & Mclsaac, 2002) and is considered as the feeling of being aware of the other person in such a way that the other person seems 'real' in the online communication (Kreijns, Kirschner, Jochems, & van Buuren, 2011). A social presence scale (Kreijns & Kirschner, in preparation) was included in the questionnaires. Contrary to the expectations, higher feelings of social presence did not lead to higher perceptions of feedback quantity and quality. An item level analysis showed that individual items of the social presence scale did however relate to perceptions of feedback quantity and quality in alignment with the expectations. Likely, the social presence scale encompasses different subscales, which can only be determined by means of factor analysis, for which a larger sample is needed. Based upon these findings it can be concluded that social presence affects feedback processes, however, the social presence scale needs to be validated and implemented in future research in such a way that more profound claims about its influence can be made.

In the other online setting in Chapter 3, the social presence scale was not completed by the participants. Nevertheless, the interview results provide indications that the participants did not have high feelings of social presence. The participants agreed that much time elapsed before new messages were posted and therefore the interaction process did not start up or kept going (see Section 3.5).

7.1.3.4 *Process supervisors*

Chapter 4 shows the importance of an excellent process supervisor, who guides the sessions, models solution-focused thinking, reflects explicitly on the coaching behaviours, interrupts when coaching behaviours tend to become less effective, and encourages peer coaches to give effective feedback. It can be concluded that the process supervisor has major influence on the feedback patterns. The other studies did not explicitly examine the process supervisor's role. In Chapter 3, a process supervisor was not present in the online environment and Chapters 5 and 6 did not report on the process supervisors.

7.2 STRENGTHS AND LIMITATIONS

A first strength of this dissertation is that the four empirical studies were conducted in naturalistic real life settings and mixed methods were used. Moreover, we have acknowledged the complexity of feedback processes instead of setting up randomized control trials that tend to be isolated and simplified (Martens, 2010; Reeves, 2006). Second, the participants of each study were employed in different school levels, from primary schools, to secondary schools, to special education, to student teachers. As a consequence, we were able to recognize how teachers from different school levels give and receive feedback and, in a greater perspective, think about their professional development. Finally, because we wanted to examine feedback processes, qualitative analyses were implemented. Therefore, we were able to reveal valuable insights into teachers' feedback processes; on the other hand, each study had a small number of participants.

Another strength is that in each study the VIP procedure was implemented and used as a context to observe feedback processes. As a consequence, all teachers received the same kind of opportunity and could profit from the procedure's elements. On the other hand, the findings might have been a consequence of the implementation of the VIP procedure.

Most peer groups in the studies had a different process supervisor because the VIP procedure was implemented in different schools. If all groups would have had the same process supervisor, it might have been controlled for. Yet, different process supervisors might have made it possible that different feedback patterns – both effective and ineffective – emerged and could be studied.

The TFOS is an observational instrument that distinguished feedback dimensions and elements that are based upon literature. The TFOS does not focus on aspects such as trust and credibility, which are considered to influence feedback processes (Ilgen, Fisher, & Taylor, 1979). Indications on such aspects are revealed in the interviews, but it might be worthwhile to investigate these kinds of aspects more systematically.

The studies examined the interaction between receivers, providers, and feedback messages, which is a major part of feedback processes. Learning outcomes were not addressed in the studies, because the feedback processes were studied in depth.

7.3 SUGGESTIONS FOR FUTURE RESEARCH

This dissertation has left some unanswered questions, for instance, the role of the process supervisor. Chapter 4 has found indications on the importance of a proficient process supervisor; however, the other studies did not explicitly focus on this

person. A future study could explore how different process supervisors perform in the peer coaching sessions and what their influence on the feedback processes is.

The study described in Chapter 3 could be repeated in order to establish conditions that support asynchronous feedback. A larger sample is needed and factors such as social presence could be incorporated. The role that social presence plays in online peer coaching was not fully understood in Chapter 6. In addition, the lessons learned formulated in Chapter 3 (see Section 3.5.1) would need to be taken into account when such a research is conducted.

In two different communication settings (face-to-face and synchronous online; Chapters 5 and 6), the same relations of effective elements and effectiveness of these elements were found (see Table 7.1 and Section 7.1.3.2). To further explore these relations, it could be investigated why certain feedback elements have a positive effect on the dimensions or not, for instance by focusing on whether different types of open-ended questions have a different kind of effect, such as “why” and “how”. Another possibility is to examine if the person giving feedback makes a difference, for instance, the process supervisor or the peer coaches. In addition, stimulated recall interviews could be implemented, that take into account the thoughts of the participants.

Furthermore, patterns of feedback could be examined by means of Markov chains (Frasconi, Soda, & Vullo, 2002; Rabiner, 1989). Markov chains describe specific states, the chances that these states remain the same, and the chances that a state flows through another state. An example is the weather: three states are sunny, cloudy, and rainy. Based on averages established since the weather was logged, it can be determined what the chances are that tomorrow will be sunny again, tomorrow will be cloudy again, or tomorrow will be rainy again. Furthermore, it can be determined that tomorrow it will rain after a cloudy day, or that tomorrow it will be sunny after a rainy day, and so forth. Based on these chances, it can be predicted what people will do tomorrow: go to the beach, to a shopping mall, or to a cinema. This example shows an overt Markov chain. Markov chains can also be hidden, for instance, in conversations, as Soller has shown (Soller & Lesgold, 2000; Soller, Wiebe, & Lesgold, 2002). These hidden Markov chains can also be used to investigate how the feedback elements emerge during peer coaching and how they influence the feedback dimensions.

Another area for future research could examine feedback processes as a whole. Future studies could examine (learning) outcomes of peer coaching and relate these to feedback patterns. In addition, the TFOS could be adapted in such a way that it also distinguishes unobservable elements (e.g., trust or credibility) or personality traits (e.g., self efficacy, locus of control or goal orientation).

Another area for future research is to explore whether the findings from the studies can be generalized. For instance, future research could apply the TFOS to other coaching settings, for instance, supervision or coaching that does not use

video excerpts. As such, it can be examined if the same relations between elements and the effectiveness of these elements emerge in these kinds of settings.

A final area for future research could systematically focus on non verbal cues in face-to-face and online settings. What role do non verbal cues play in the feedback processes? Would it be more effective to look somebody in the eyes? Which kind of gestures do feedback providers use? In the context of online feedback, it can be studied if feedback providers make any gestures when sitting behind their computers. Are these gestures similar to those made in face-to-face settings?

7.4 IMPLICATIONS

When feedback is given between teachers, it is important that providers adopt an attitude of respect to receivers and receivers should be open minded to the feedback to come. From there on, providers should elicit goal-directed, specific, detailed, and neutral feedback by phrasing feedback elements that were shown to do so, such as open-ended, guiding, and solution-focused questions and continuous questioning after summarizing. Feedback providers should try to avoid to judge, to hint, to finish sentences, and to provide examples from their own experiences. Moreover, feedback providers should keep on trying to provoke effective feedback, because our findings indicate that achieving effective feedback sometimes takes more than one attempt. In addition, a cycle of planning, acting, and evaluating should be incorporated, which allows for changes in teacher behaviours.

If feedback is given in online settings, it is likely more effective in synchronous online environments. This implication suggests that the often cited advantage of place and time independence is restricted to place independence. Yet, in the recent society where social media are more and more incorporated into human life, time independence can not easily be rejected. So, if feedback needs to be given in place and time independent environments, it is important to, for instance, agree on reaction time and to train on how written feedback is transmitted (see also Section 3.5.1).

Even though we did not aim to investigate the peer coaching program (i.e., the VIP procedure; Jeninga, 2003), the studies show that the VIP procedure is a promising system to lead to teacher professional development. The procedure's system follows the signposts of *Visible Learning* (Hattie, 2009; Chapter 4, Section 4.1.2) and facilitates effective face-to-face and synchronous online feedback (Chapters 4, 5, and 6). However, teachers seem to keep themselves from participating in the procedure. First, they argue that it takes too much time, which can be solved by implementing social media. Second, teachers seem to be afraid of viewing themselves or being viewed by their colleagues, which can be resolved by deploying proficient process supervisors. Teachers should step over these thresholds, where there are many

opportunities for them to further develop themselves to become and remain professional teachers.

Generally, this dissertation implies that teacher professional development activities benefit from an attitude of respect and openness, a cycle of planning, acting, and evaluating, and feedback processes. Such teacher professional development activities should be implemented in schools more systematically, so that these activities lead to professional teachers that are capable of providing quality education to their students.

Appendix

APPENDIX

Table 1 Overview of the articles with a behaviouristic point of view on learning

Authors	Type of article	Description
Werts et al. (1995)	Meta analysis	Summarizing the existing research on instructional feedback in special education.
Lambert (2000)	Conference proceedings	How can teachers correct errors of pupils who read orally and what is the effect of intervention training?
Scheeler and Lee (2002)	Empirical study	Coaching preservice teachers on attaining an instruction method via Bug in Ear (BIE). What type of feedback is more effective for attaining the instruction method and how did the participants experience the BIE?
Ferreira et al. (2007)*	Empirical study	What type of corrective feedback is given in second language acquisition classroom and what does that imply for second language acquisition via computer learning?
Goodman et al. (2008)	Empirical study	Does the BIE support the accuracy and delivery rates of an instructional method by preservice teachers and would these rates continue if BIE was faded?

* was also assigned to cognitivism

Table 2 Overview of the reviewed articles with a cognitivistic point of view on learning

Authors	Type of article	Description
Luft (1969)	Theoretical notion	Presenting the JOHARI window, that explains how an individual or group can think about his behaviour.
London and Smither (1995)	Theoretical notion and empirical study	Reviewing the research on multisource feedback, synthesizing the research into a model of multisource feedback, and investigating how multisource feedback is applied in organisations.
Kluger and DeNisi (1996)	Meta analysis	Synthesizing the research on Feedback Interventions into the Feedback Intervention Theory (FIT) and preliminary testing FIT.
Ashwell (2000)	Empirical study	In which order should teachers give content and form feedback on students' writing in second language acquisition and is it necessary to separate content feedback from form feedback?
Hyland (2001)	Empirical study	What kinds of feedback are given in a distance education course, which is perceived by students as most helpful, how did students use the given feedback, and what kinds of feedback do teachers see as most helpful?
Ross and Tronson (2005)	Conference proceedings	How do students react to different types of tutor feedback on a first draft of writing?
Ferreira et al. (2007)*	Empirical study	What type of corrective feedback is given in second language acquisition classroom and what does that imply for second language acquisition via computer learning?
Shute (2008)	Meta analysis	Reviewing research on formative feedback at a task level and providing guidelines of formative feedback based on the review.
Morra and Asis (2009)	Empirical study	What are the effects of on-tape feedback and written feedback on a writing assignment in the context of English as foreign language?

* was also assigned to behaviourism

Table 3 Overview of the reviewed articles with a social cultural point of view on learning

Authors	Type of article	Description
Brinko (1993)	Literature review	Reviewing literature to extrapolate feedback giving practices to postsecondary teachers to improve their teaching.
Chi (1996)	Literature review and empirical study	Considering the contributions of tutor and tutee in human tutoring and presenting a case study of human tutoring to assess what specific knowledge has been learned.
Oliver (2000)	Empirical study	Do differences exist in giving negative feedback in second language acquisition according to a) age and b) type of lesson?
Chi et al. (2001)	Empirical study	Which approach (tutor centred, tutee centred, and interaction) is more effective in human tutoring?
Lehrman-Waterman and Ladany (2001)	Empirical study	Developing and validating a self-report measure that assesses the supervisee's experiences of evaluation activities (i.e. goal setting and feedback).
Tuzi (2001)	Conference proceedings	Description of a study of electronic feedback given by teacher and peers in second language acquisition.
Ovando (2005)	Empirical study	How can aspiring school leaders develop their instructional leadership to deliver constructive, written feedback?
Chin (2006)	Empirical study	Developing a framework that represents classroom talk and questioning in science. How do teachers use questioning to develop students' understanding of science and how do teachers give feedback?
Tang and Chow (2007)	Empirical study	How was feedback communicated during post-observation conferences within teacher practice supervision?
Blatt et al. (2008)	Empirical study	Exploring the usefulness of interaction analysis in assessing feedback processes.
De Kleijn et al. (2009)	Conference proceedings	Investigating the relation between teacher-student relationship in thesis supervision and perceptions of feedback.
Yeh and Lo (2009)	Empirical study	Developing an online annotation system for learning writing in another language. Does the online annotation system lead to more effective error correction in writing assignments in English as foreign language?

Table 4 Overview of reviewed articles with a meta-cognitivist point of view on learning

Authors	Type of article	Description
Ilgén et al. (1979)	Literature review	Reviews how feedback affects individuals in organisations and presents a four stage model on how individuals process feedback.
Sadler (1989)	Meta analysis	Reviewing formative feedback.
Nicol and McFarlane-Dick (2006)	Theoretical notion	Proposes seven principles of good feedback in self-regulated learning.
Timperley and Parr (2007)	Empirical study	Describing how two premises of a project of literacy professional development support the success of the project.
Hawk and Shah (2008)	Theoretical notion	Extending Butler and Winne's model of feedback in self-regulated learning into a practical and useable model for faculty.

Table 5 Overview of reviewed articles with a social constructivist perspective on learning

Authors	Type of article	Description
Black and William (1998a)	Meta analysis	Reviewing the literature on classroom formative assessment.
Black and William (1998b)	Theoretical notion	Is there evidence that improving formative assessment raises standards? Is that evidence that there is room for improvement? Is there evidence about how to improve formative assessment?
Bing-You et al. (1998)	Empirical study	How does an intervention workshop affect feedback given to medical students? How can medical students actively participate in obtaining optimal feedback?
Tillema and Smith (2000)	Empirical study	How do students use feedback information provided to them in distinctly framed portfolios?
McDonald (2001)	Empirical study	How do distance education learners perceive feedback on a writing assignment?
Manouchehri (2002)	Empirical study	How does peer collaborative reflection impact individual preservice teachers? How do peers contribute to one another's development of professional knowledge?
Mory (2003)	Literature review	Reviewing the feedback literature, showing the complexity of feedback.
Zwart et al. (2004)	Theoretical notion	Presenting a model of learning activities that teachers can perform to develop their knowledge, skills and attitude.
Schelfhout et al. (2004)	Empirical study	If, and in what ways, can a 'learning enterprise' constitute a powerful learning environment aimed at teaching students certain cooperative skills in a entrepreneurial context?
Gibbs and Simpson (2004)	Theoretical notion	How does assessment influence student learning behaviour and outcomes? Synthesizing literature into ten conditions about how assessment influences student learning behaviour and outcomes.
Swick et al. (2006)*	Theoretical notion	Reviewing various assessment tools used in postgraduate medical training and reviewing the literature on these tools.
Weaver (2006)	Empirical study	Carrying out a qualitative and quantitative study which focuses on student attitudes, beliefs, and perceptions in relation to written feedback given by tutors.
Hattie and Timperley (2007)	Literature review	Reviewing feedback literature and presenting a model of effective feedback. Using the model to elucidate some discussions about feedback.
Brandt (2008)	Empirical study	Examining tutor and peer post-teaching practice feedback for preservice teachers. Identifying eight critical factors in giving and receiving feedback.
Segers et al. (2008)	Empirical study	Investigating the relationship between students' perceptions of a portfolio assessment and their approaches to learning.
Landry et al. (2009)*	Empirical study	How do mentoring and feedback affect teachers' writing skills instruction?

* was also assigned to cognitive apprenticeship method

Table 6 Overview of reviewed articles with the perspective of cognitive apprenticeship method

Authors	Type of article	Description
Licklider (1995)	Empirical study	Investigating the effects of peer coaching inservice model on teachers' use of a teaching technique. Determining the influence of components of the model on teachers' effective use of the technique. Examining teachers' perceptions of the model.
Sharpe et al. (2003)	Empirical study	Is it feasible to combine MDCV (Multipoint Desktop Video Conferencing) and making and streaming of teaching video clips? What are technological and administrative arrangements required to optimize these arrangements? Do the making, showing, and discussion of these teacher video clips during MDCV conferences assist teacher trainees to reflect on their teaching?
Yang and Liu (2004)	Empirical study	Investigating the use, effectiveness, and value of an online workshop for teachers.
Roter et al. (2004)	Empirical study	Exploring the acceptability and use of an innovative video feedback program in medical education.
Swick et al. (2006)*	Theoretical notion	Reviewing various assessment tools used in postgraduate medical training and reviewing the literature on these tools.
Goodnough et al. (2009)	Empirical study	Exploring a triad model (i.e. two preservice teachers and one cooperating teacher) of coaching. What types of co-teaching emerge and what are (dis)advantages of the triad model?
Landry et al. (2009)*	Empirical study	How do mentoring and feedback affect teachers' writing skills instruction?

* was also assigned to social constructivism

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Summary

Feedback has long been recognised as an effective tool for student learning. We presume that feedback is an essential tool for learning processes of any learner, and consequently, for teachers in their professional development as well. However, few studies have focused on feedback among teachers. In addition, few studies have explored what characteristics of feedback are effective for learning processes in online environments.

Therefore, this dissertation aims to further understand feedback processes among teachers in both face-to-face and online conditions. The studies took place within a specific professional development context, namely a peer coaching program: the Video Intervention Peer coaching (VIP) procedure. The VIP procedure encompasses video excerpts of teaching behaviours, reciprocal peer coaching under the guidance of a process supervisor, a cyclic workflow, and solution-focused thinking. The VIP procedure was implemented in several conditions: in an asynchronous online environment, in face-to-face settings, and in a synchronous online environment. The main research goal is to examine what characteristics of feedback are effective in each of these settings.

In **Chapter 2**, the concept feedback is theoretically explored. The first research goal is to determine what characteristics make feedback effective for learning. In the chapter, the proposition that characteristics of effective feedback and feedback processes depend on the learning theory is explored. Indeed, learning theories describe how learning processes develop and each learning theory lays different emphases. The second research question focuses on providing insights into effective feedback characteristics and feedback processes among teachers. A systematic literature review was conducted, in which six learning theories were distinguished: behaviourism, cognitivism, social cultural theory, meta cognitivism, social constructivism, and cognitive apprenticeship method. Findings of the first research question show that some characteristics are considered effective reasoning from each learning theory: effective feedback is task- or goal-directed, specific, and neutral. Second, several characteristics are considered effective reasoning from three to five learning theories. Based on these findings, four rules of thumb were formulated: (a) learners should have the opportunity to engage in dialogue, (b) characteristics of learners should be taken into account and they should be respected and supported, (c) feedback should support to further improve learning, and (d) feedback should be given frequently and when it is still relevant to the learners. Third, some characteristics of feedback are considered effective reasoning from only one theory, as was expected. For instance, behaviourism suggested that feedback should be timed immediately and meta-cognitivism indicated that feedback should support the “learning to learn” processes. Regarding the second research question, it is concluded that studies mostly focused on perceptions of (student) teachers about received feedback or manipulated feedback to unravel its effectiveness. However, no study investigated feedback processes among teachers by means of observation.

This finding indicates a major challenge for future research. This dissertation took up that challenge by empirically observing feedback among teachers in their professional development activities. Especially, we reasoned from social constructivism and cognitive apprenticeship method, because these learning theories connect to peer-to-peer feedback among teachers. The conclusions and recommendations of this chapter were summarized into a number of indicators, that lay the foundations for a to be developed observational instrument.

Chapter 3 describes an explorative study in which the VIP procedure was implemented in an asynchronous online environment, in which the participants were independent of place and time. A group of teachers was supposed to participate for six months, but the interaction gradually decreased and ended after about three months. This study's aims are to (a) characterise the online coaching skills and (b) to explore how the online pilot developed. The coaching skills were observed and the participants were interviewed. It is concluded that the coaching skills were mostly not in alignment with what the VIP procedure intends. Many evocative questions were posed, misunderstandings arose, and slightly more feedback focused on the students' behaviour rather than on the teachers'. The decreasing interaction was caused by, among others, lack of time, decreasing motivation, low technical skills, and lack of fully understanding the concept of the VIP procedure. Based on these results, it is decided to implement the VIP procedure in face-to-face settings, that allow continuous and structured interaction, which in turn allows us to observe feedback processes.

The first goal of **Chapter 4** is to develop an observational instrument that is capable of determining the effectiveness of feedback. The second goal is to generate preliminary results regarding patterns of effective and ineffective feedback. The observational instrument, the *Teacher Feedback Observation Scheme* (TFOS), is developed based on the conclusions, rules of thumb, and indicators that were established in Chapter 2. The TFOS distinguishes five dimensions of feedback: (a) goal-directedness versus non-goal-directedness, (b) specific versus vague, (c) detailed versus non-detailed, (d) corrective versus non-corrective, and (e) positive versus negative. In addition, the TFOS incorporates elements, such as open-ended, guiding, and evocative questions and hinting, that were based on the VIP procedure and coaching literature. To determine the inter-rater reliability, two independent researchers tested the TFOS. The inter-rater reliability was substantial. In this study, three groups of teachers participated in three face-to-face VIP sessions and a fourth group implemented the VIP procedure in an asynchronous online environment. The TFOS was used to analyse these face-to-face and online sessions. Preliminary results show that open-ended, guiding, and continuous questioning ascertain effective patterns. Ineffective patterns, such as hinting and asking evocative questions, emerged but were usually turned into more effective patterns by all participants. In the online group, interaction hardly occurred and feedback was mostly ineffective.

Finally, the TFOS shows the influence of the process supervisor on the feedback processes: the process supervisor steers the sessions, he interrupts when feedback tends to become less effective, and encourages the teachers to give effective feedback. Firstly, it is concluded that the TFOS is a promising instrument for observing feedback among teachers. This does not mean that the TFOS should not be further adapted. Second, face-to-face peer coaching seems to be more suitable for giving effective feedback than asynchronous peer coaching.

Chapter 5 aims to investigate the coherence between observed and perceived feedback. In this study, the VIP procedure was implemented face-to-face in two schools and four peer groups participated. The TFOS was adapted, following suggestions put forward in Chapter 4. The dimension corrective versus non-corrective was deleted, because corrective feedback does not align with the VIP procedure's philosophy. Furthermore, some feedback elements were added, such as summarizing and finishing sentences, because these emerged often and might influence feedback processes. The adapted TFOS was used to analyse two or three VIP sessions of each group. To further examine the influence of each element on the dimensions, expectations of effectiveness of the elements were formulated, based on results of the former study and on literature. It was expected that, for instance, open-ended questions and summarizing would make the dimensions more effective (i.e., more goal-directed, more specific, more detailed, and neutral) and that, for instance, hinting and judging would make the dimensions less effective or even ineffective (i.e., more non-goal-directed, more vague, less detailed, and too positive or too negative). For each feedback element it was determined whether it positively influenced the dimensions or not, or in other words, did the elements act as was expected? The effectiveness of observed feedback was determined on a combination of feedback dimensions, the number of feedback elements, and the effect of the elements on the dimensions. After each session, the participants completed questionnaires that focused on their perceptions of received feedback. After the trajectory, they were interviewed to gather qualitative data on their experiences. Results show that the feedback dimensions were generally effective. This indicates that in most cases feedback was more goal-directed, more specific, more detailed, and neutral than non-goal-directed, vague, lacking details, and too positive or too negative. Furthermore, the feedback elements mostly acted as expected. For instance, open-ended questions were mainly effective and judging was mostly ineffective, in line with the expectations. Closed questions, summarizing, and acknowledging, however, did not have the expected effect. Teachers were overall positive about the received feedback. It is concluded that participants who received more than average effective feedback – assessed on the observations (observed feedback) –, also perceive this as more effective (perceived feedback) than participants who received less than average effective feedback. Moreover, these latter participants also perceived feedback as less effective. The differences between these participants lay not

only in the amount of effective feedback elements, but also in the effectiveness of these elements.

Similar to Chapter 5, the study described in **Chapter 6** aims to investigate the coherence between observed and perceived feedback. In contrast to the former study, the VIP procedure was implemented in a synchronous online environment, in which participants are independent of place but not of time. A factor that is considered to influence online communication is *social presence*. Social presence is the feeling that other people in the online setting are lifelike and real. This factor was one of the explanations for the premature end of the pilot in Chapter 3 and therefore in Chapter 6, the influence of social presence on the coherence of observed and perceived feedback is examined. Sixteen student teachers participated. Five peer groups used the synchronous online environment and had one or two sessions. The TFOS was used to analyse these sessions, in the same way as it was in Chapter 5. The participants filled in questionnaires after each session, that were equal to the questionnaires completed in Chapter 5. The questionnaires also included a social presence scale. Results show that, equal to Chapter 5, the feedback dimensions were generally effective and that feedback elements were mostly in alignment with the expected influences. Student teachers were overall positive about the received feedback. The coherence between observed and perceived feedback was also found in this study. Individual items of the social presence scale correlated with perceived feedback in alignment with the expectations: more feelings of social presence related to more satisfaction with feedback quantity and quality.

Chapter 7 draws six conclusions. The first conclusion is that effectiveness of feedback depends more on patterns of multi-dimensional feedback characteristics than on one dimensional characteristics. The second conclusion is that process supervisors have a major influence on feedback processes among teachers. The third conclusion is that social presence affects feedback processes, however, the social presence scale needs to be validated and implemented in future research in such a way that more profound claims about its influence can be made. The fourth conclusion is that oral (face-to-face and synchronous online) feedback is more effective for learning processes than written asynchronous feedback and that if written asynchronous feedback needs to be effective, recommendations of this and other research must be implemented. Some examples of these recommendations are that teachers should be facilitated by their school leaders by allocating time and space and that training can support to learn how written online messages are perceived by the receiver. The fifth conclusion is that even though hardly any research has investigated feedback processes between teachers, research findings on feedback from teachers to students are applicable to feedback processes between teachers. The final conclusion is that teacher professional development is reinforced if situations that allow teachers to give feedback such as peer coaching are more systematically implemented in schools.

Samenvatting

Feedback wordt sinds lange tijd erkend als een effectief middel voor het leren door leerlingen. We vermoeden dat feedback een essentieel onderdeel is voor het leerproces van iedere lerende en dus ook voor leraren in hun professionele ontwikkeling. Er is echter weinig onderzoek gedaan naar feedback tussen leraren. Daarnaast hebben weinig studies zich gericht op welke feedbackkenmerken effectief zijn voor leerprocessen in online leeromgevingen.

Daarom is het doel van deze dissertatie feedbackprocessen tussen leraren in zowel face-to-face als online condities beter te begrijpen. Het onderzoek heeft plaatsgevonden in een specifieke professionaliseringscontext, namelijk het Video Intervisie Peer coaching (VIP) model. Het VIPmodel omvat video-opnames van lerarengedrag, wederzijdse peer coaching onder leiding van een procesbegeleider, een cyclische werkwijze en oplossingsgericht denken. Het VIPmodel werd in verschillende condities geïmplementeerd: asynchroon online, face-to-face en synchroon online. Het overkoepelende onderzoeksdoel is te bestuderen welke kenmerken van feedback effectief zijn in deze drie condities.

In **Hoofdstuk 2** is het begrip feedback theoretisch verkend. De eerste onderzoeksvraag is te bepalen welke kenmerken van feedback effectief voor het leren zijn. In het hoofdstuk wordt de veronderstelling onderzocht dat kenmerken van effectieve feedback afhankelijk zijn van de aangehangen leertheorie. Immers, leertheorieën beschrijven hoe leerprocessen verlopen, waarbij iedere leertheorie andere accenten legt. De tweede onderzoeksvraag richt zich erop inzichten te verkrijgen over effectieve feedbackkenmerken en feedbackprocessen tussen leraren. Er is een systematische literatuurstudie uitgevoerd, waarin zes leertheorieën werden onderscheiden: het behaviorisme, het cognitivisme, de handelingspsychologie, het metacognitivisme, het sociaal constructivisme en de cognitieve vakmanschapmethode. De resultaten van de eerste onderzoeksvraag laten ten eerste zien dat bepaalde feedbackkenmerken vanuit alle leertheorieën als effectief worden bestempeld: effectieve feedback is taak- of doelgericht, specifiek en neutraal. Ten tweede wordt een aantal kenmerken vanuit drie tot vijf leertheorieën als effectief beschouwd. Op basis hiervan zijn vier algemeen geldende richtlijnen geformuleerd: (a) lerenden moeten de kans krijgen in dialoog te treden, (b) er moet rekening gehouden worden met kenmerken van de lerenden en zij moeten gerespecteerd en ondersteund worden, (c) feedback moet het verder verbeteren van het leren ondersteunen en (d) feedback moet regelmatig gegeven worden zodat het relevant is voor de lerenden. Ten derde worden, zoals verwacht, bepaalde kenmerken van feedback vanuit maar een leertheorie als effectief beschouwd. Zo wordt, redenerend vanuit het behaviorisme, verondersteld dat feedback meteen gegeven moet worden en vanuit het meta-cognitivisme, dat feedback het “leren te leren” moet ondersteunen. Wat betreft de tweede onderzoeksvraag is geconcludeerd dat studies vooral gericht waren op percepties van (student)leraren over feedback of op het manipuleren van kenmerken van feedback om de effectiviteit bloot te leggen. Geen enkel onderzoek

gebruikte echter observatietechnieken om feedbackprocessen tussen leraren te bestuderen. Dit betekende een aanzienlijke uitdaging voor verder onderzoek. In deze dissertatie is deze uitdaging aangegaan door feedback tussen leraren in hun professionele ontwikkelingsactiviteiten empirisch te observeren. Daarbij werd uitgegaan van het sociaal constructivisme en de cognitieve vakmanschapmethode, omdat die leertheorieën het beste aansluiten bij *peer-to-peer feedback* tussen leraren. De conclusies en aanbevelingen van dit hoofdstuk zijn samengevat in een aantal indicatoren, die de basis vormden voor een te ontwikkelen observatie-instrument.

Hoofdstuk 3 beschrijft een exploratieve studie, waarin het VIPmodel in een asynchrone online omgeving werd ingezet, waarbij de deelnemers onafhankelijk van plaats en tijd waren. Een groep leraren zou zes maanden deelnemen, maar de interactie tussen hen nam geleidelijk af en stopte na ongeveer drie maanden. De doelen van deze studie zijn om (a) de online coachingsvaardigheden te typeren en (b) in kaart te brengen hoe de pilot zich ontwikkelde. De coachingsvaardigheden werden geobserveerd en de deelnemers werden geïnterviewd. Er is geconcludeerd dat de coachingsvaardigheden over het algemeen niet overeenkwamen met de intenties van het VIPmodel. Er werden veel suggestieve vragen gesteld, de deelnemers begrepen elkaar niet altijd en feedback was iets meer gericht op het gedrag van leerlingen dan op het lerarengedrag. De oorzaken van de afnemende interactie waren onder meer tijdgebrek, afnemende motivatie, ontbrekende technische vaardigheden en onbegrip over de bedoelingen van het VIPmodel. Op basis van deze resultaten is besloten het VIPmodel in face-to-face condities in te zetten die constante en doorlopende interactie mogelijk maken en die daarmee de kans bieden om feedbackprocessen nader te observeren.

Het eerste doel van **Hoofdstuk 4** is om een observatie-instrument te ontwikkelen dat de effectiviteit van feedback kan bepalen. Het tweede doel is om eerste inzichten te genereren over patronen van effectieve en niet-effectieve feedback. Het observatie-instrument, de *Teacher Feedback Observation Scheme* (TFOS), is ontwikkeld, gebaseerd op de conclusies, algemeen geldende richtlijnen en indicatoren uit Hoofdstuk 2. De TFOS onderscheidt vijf dimensies van feedback: (a) doelgerichtheid versus niet-doelgerichtheid, (b) specifiek versus algemeen, (c) gedetailleerd versus niet-gedetailleerd, (d) correctief versus niet-correctief en (e) positief versus negatief. Daarnaast omvat de TFOS een aantal feedbackelementen, zoals open, richtinggevende en suggestieve vragen en tips geven, die gebaseerd zijn op het VIPmodel en coachingsliteratuur. Om de inter-beoordelaarbetrouwbaarheid te bepalen, testten twee onafhankelijke onderzoekers de TFOS. De inter-beoordelaarbetrouwbaarheid was voldoende. In deze studie namen drie groepen leraren deel aan drie face-to-face VIP-sessies en een vierde groep paste het VIPmodel toe in een asynchrone online omgeving. De TFOS werd gebruikt om deze face-to-face en online sessies te analyseren. De eerste resultaten laten zien dat open en richtinggevende vragen evenals doorvragen effectieve patronen van feedback versterken. Ineffectieve

ve patronen, zoals tips geven en suggestieve vragen stellen, kwamen voor, maar werden meestal door alle betrokkenen in de face-to-face groepen omgebogen naar meer effectieve patronen. In de online groep was er weinig interactie en was de feedback veelal ineffectief. Ten slotte liet de TFOS de invloed van de procesbegeleider op het proces zien: de procesbegeleider stuurt de coachingssessies, hij grijpt in als de feedback minder effectief lijkt te worden en stimuleert de docenten om effectieve feedback te geven. Er is in de eerste plaats geconcludeerd dat de TFOS een veelbelovend instrument is om feedback tussen leraren te observeren. Dit neemt niet weg dat het instrument doorontwikkeld moet worden. Ten tweede lijkt face-to-face peer coaching een meer geschikte context om effectieve feedback te geven dan asynchrone peer coaching.

Hoofdstuk 5 is erop gericht om de coherentie tussen geobserveerde en gepercipieerde feedback te onderzoeken. In deze studie werd het VIPmodel face-to-face ingezet op twee scholen en er hebben vier groepen leraren deelgenomen. De TFOS werd aangepast op basis van suggesties gegeven in Hoofdstuk 4. De dimensie correctief versus niet-correctief werd verwijderd, omdat correctieve feedback niet strookt met de filosofie van het VIPmodel. Verder werd een aantal feedbackelementen toegevoegd, zoals samenvatten en andermans zinnen afmaken, omdat deze vaak voor bleken te komen en wellicht de feedbackprocessen beïnvloedden. De aangepaste TFOS werd gebruikt om twee of drie VIP sessies van iedere groep te analyseren. Om de invloed van de feedbackelementen op de feedbackdimensies nader te bestuderen werden er, op basis van de resultaten uit de vorige studie en literatuur, verwachtingen opgesteld ten aanzien van de effectiviteit van de feedbackelementen op de dimensies. Er werd bijvoorbeeld verwacht dat open vragen stellen en samenvatten de dimensies effectiever zouden maken (i.e., meer doelgericht, specifiek, gedetailleerd en neutraal) en, bijvoorbeeld, dat hints geven en negatief beoordelen de dimensies minder effectief of zelfs ineffectief zouden maken (i.e., minder doelgericht, vager, minder gedetailleerd, en meer positief of meer negatief). Van ieder element werd bepaald of het de dimensies effectiever maakte of niet, met andere woorden, had het element de verwachte uitwerking of niet? De effectiviteit van geobserveerde feedback werd bepaald op basis van een combinatie van feedbackdimensies, het aantal feedbackelementen en de effectiviteit van de elementen op de dimensies. Na iedere sessie vulden de deelnemers een vragenlijst in over hun percepties van de ontvangen feedback. Na afloop van het traject werden de deelnemers geïnterviewd om kwalitatieve data over hun ervaringen te verzamelen. De resultaten laten zien dat de feedbackdimensies over het algemeen effectief bleken te zijn. Dat wil zeggen dat feedback gemiddeld meer doelgericht, specifiek, gedetailleerd en neutraal was dan niet-doelgericht, algemeen, vaag en ofwel heel positief of heel negatief. Verder hadden de meeste feedbackelementen de verwachte uitwerking. Zo waren open vragen gemiddeld vaak effectief en was negatief beoordelen vaak ineffectief, in lijn met de verwachtingen. Gesloten vragen, samenvat-

ten en erkennen hadden echter niet de verwachte positieve uitwerking op de dimensies. De leraren waren over het algemeen tevreden met de ontvangen feedback. Er is geconcludeerd dat deelnemers die gemiddeld meer effectieve feedback kregen – vastgesteld op basis van de observaties (geobserveerde feedback) – deze als meer effectief ervoeren (gepercipieerde feedback) dan deelnemers die gemiddeld minder effectieve feedback kregen. Bovendien percipieerden deze laatste deelnemers de feedback ook als minder effectief. De verschillen tussen deze deelnemers lagen niet alleen in het aantal verwachte effectieve elementen, maar ook in de effectiviteit van deze elementen.

Net zoals Hoofdstuk 5, richt de studie in **Hoofdstuk 6** zich erop de coherentie tussen geobserveerde en gepercipieerde feedback te bestuderen. In tegenstelling tot het vorige hoofdstuk werd in deze studie het VIPmodel in een synchrone online omgeving ingezet, waarbij de deelnemers wel afhankelijk van plaats, maar niet afhankelijk van tijd waren. Een factor waarvan verondersteld wordt dat die online communiceren beïnvloedt is *social presence*. Social presence is het gevoel dat de anderen lijfelijk en echt aanwezig zijn in de online communicatie. Deze factor was een van de verklaringen voor het voortijdige einde van de pilot in Hoofdstuk 3 en daarom is in Hoofdstuk 6 de invloed van social presence op de coherentie tussen geobserveerde en gepercipieerde feedback onderzocht. Zestien studentleraren namen deel. Vijf groepen gebruikten de synchrone online omgeving en hadden een of twee peer coachingssessies. De TFOS werd op dezelfde manier als in Hoofdstuk 5 gebruikt om deze sessies te analyseren. Na iedere sessie vulden de studentleraren een vragenlijst in, die gelijk was aan die van de studie uit Hoofdstuk 5. De vragenlijst werd aangevuld met een social presence schaal. De resultaten laten zien dat, net zoals in Hoofdstuk 5, de feedbackdimensies over het algemeen effectief waren en dat de feedbackelementen meestal de verwachte uitwerking hadden. De studentleraren waren over het algemeen tevreden met de ontvangen feedback. De coherentie tussen geobserveerde en gepercipieerde feedback werd ook in deze studie gevonden. Individuele items van de social presence schaal correleerden met gepercipieerde feedback zoals verwacht: meer gevoelens van social presence hingen samen met meer tevredenheid over de kwantiteit en kwaliteit van feedback.

Hoofdstuk 7 trekt zes conclusies. De eerste conclusie is dat de effectiviteit van feedback meer afhangt van patronen van multi-dimensionale feedbackkenmerken dan van één dimensionale karakteristieken. De tweede conclusie is dat procesbegeleiders van grote invloed zijn op feedbackprocessen tussen leraren. De derde conclusie is dat social presence feedbackprocessen beïnvloedt, maar de social presence schaal dient gevalideerd en in verder onderzoek gebruikt te worden zodat meer gegronde uitspraken over deze invloed gedaan kunnen worden. De vierde conclusie is dat mondelinge (face-to-face en synchroon online) feedback effectiever voor het leerproces is dan geschreven asynchrone feedback en dat als geschreven asynchrone feedback effectief moet zijn, aanbevelingen van dit en ander onderzoek moeten

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worden geïmplementeerd. Voorbeelden van deze aanbevelingen zijn dat leraren in tijd en ruimte gefaciliteerd moeten worden door hun schoolleiders en dat trainingen kunnen helpen om te leren hoe geschreven online teksten overkomen bij ontvangers. De vijfde conclusie is dat ondanks dat weinig onderzoek feedbackprocessen tussen leraren heeft bestudeerd, onderzoeksresultaten over feedback van leraren aan leerlingen toepasbaar zijn op feedbackprocessen tussen leraren. De laatste conclusie is dat de professionele ontwikkeling van leraren versterkt wordt als situaties waarin leraren elkaar feedback kunnen geven, zoals peer coaching, meer systematisch in scholen worden geïmplementeerd.

Publications

Publications

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- Thurlings, M. Vermeulen, M., Bastiaens, Th., & Stijnen, P. (submitted). The importance of social presence and feedback in online peer coaching.
- Thurlings, M. & Vermeulen, M., Bastiaens, Th., & Stijnen, P. (submitted). Understanding feedback: A learning theory perspective.

Conference contributions

- Thurlings, M., Bastiaens, T. J., Stijnen, P. J. J., Houtmans, T., & Kreijns, C. (2008, juni). Online Video, Intervisie en Peer coaching (VIP) bij leraren: Een eerste evaluatie. Poster gepresenteerd op Onderwijs Research Dagen, Eindhoven.
- Thurlings, M., Kreijns, K., Bastiaens, T. & Stijnen, P. (2009). Video Intervention Peer Coaching in teacher professionalization: First online explorations. IN I. Gibson et al. (Eds.), *Proceedings of Society for Information Technology & Teacher Education International Conference 2009* (pp. 1118-1125). Chesapeake, VA: AACE.
- Thurlings, M., Bastiaens, T. J., Stijnen, P., & Vermeulen, M. (2009, mei). Video Intervisie Peer coaching: Een beschrijvend onderzoek [Video Intervention Peer coaching: A descriptive study]. Paper gepresenteerd op Onderwijs Research Dagen, Leuven, België.
- Thurlings, M., Kreijns, C., Bastiaens, Th., Stijnen, P., & Vermeulen, M. (2009, August). Online peer coaching for teacher professionalization: First explorations. Poster presented at the JURE, Amsterdam.
- Thurlings, M., Vermeulen, M., Bastiaens, T. J., & Stijnen, P. (2009, November). Teachers providing each other feedback within reciprocal peer coaching: What does the literature say, and what does the practice say? Paper presented at the EAPRIL, Trier.

- Thurlings, M., Vermeulen, M., Bastiaens, T. J., & Stijnen, P. (2010, juni). Hoe kunnen we feedback beter begrijpen? Een leertheoretisch perspectief op feedbackliteratuur. Poster gepresenteerd op Onderwijs Research Dagen, Enschede.
- Thurlings, M., Vermeulen, M., Bastiaens, T. J., & Stijnen, P. (2011, April). Investigating feedback among teachers: Focusing on observed and perceived feedback. Poster presented at the AERA, New Orleans, LA.
- Thurlings, M., Vermeulen, M., Bastiaens, T. J., Stijnen, P., & Kreijns, C. (2011, juni). Feedback tussen docenten in opleiding: Over geobserveerde en gepercipieerde feedback. Paper gepresenteerd op Onderwijs Research Dagen, Maastricht.

Curriculum Vitae

Marieke Thurlings was born September 16, 1982 in Eindhoven, the Netherlands. She attended pre-university education at the Lorentz Casimir Lyceum in the same city, where she graduated in 2001. In 2002, she started studying Education and Child Studies at the University of Leiden, where she graduated in Educational Studies (BSc in 2005 and MSc in 2006). Marieke's master thesis explored the relationship between students' perceptions of their assessment practice and their approaches to learning.

In 2007, she began as a PhD candidate at the Ruud de Moor Centrum⁴ of the Open University in the Netherlands. During her PhD project, she was also employed in various projects in collaboration with schools. These projects all focused on the professional development of teachers at the workplace. She presented her research at national (ORD) as well as international (JURE, EAPRIL, AERA) conferences.

Marieke Thurlings werd op 16 september 1982 geboren in Eindhoven. Ze volgde het VWO op het Lorentz Casimir Lyceum in dezelfde stad, waar ze in 2001 haar diploma behaalde. In 2002 startte ze met de studie Pedagogische Wetenschappen aan de Universiteit Leiden, waar ze afstudeerde in de richting Onderwijskunde (BSc in 2005 en MSc in 2006). Marieke's masterscriptie bestudeerde de relatie tussen student-percepties van hun assessmentpraktijk en hun studieaanpak.

In 2007 begon ze als promovenda bij het Ruud de Moor Centrum⁵ van de Open Universiteit. Tijdens haar promotietraject was ze ook werkzaam in verscheidene projecten in samenwerking met scholen. Deze projecten waren gericht op de professionele ontwikkeling van leraren op de werkplek. Ze presenteerde haar onderzoek op nationale (ORD) en internationale (JURE, EAPRIL, AERA) congressen.

⁴ Since April 24, 2012, the Ruud de Moor Centrum has proceeded under the new name LOOK (Scientific Centre for Teacher Research)

⁵ Het Ruud de Moor Centrum is vanaf 24 april 2012 verder gegaan onder de nieuwe naam LOOK (Wetenschappelijk Centrum Leraren Onderzoek)