Peer feedback in teacher professional development

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Chapter 1

Introduction

1.1 The problem

Teacher professional development (TPD) is very important for decreasing teachers' turnover rate and improving teachers' teaching expertise. In various types of TPD programmes, peer feedback is commonly used as a learning activity for teachers, because it can provide valuable learning resources and triggers participants' reflection and behavior change (Briere, 2015; Butler & Yeum, 2016; Chien, 2017; Ma, Xin, & Du, 2018; Pearce et al., 2019). In previous research, positive effects of these peer feedback-based programmes have been shown. For example, Chien (2017) explored a TPD programme involving 16 in-service primary English teachers and found that teachers' pedagogical knowledge and pedagogical content knowledge improved. Ma, Xin, and Du (2018) studied learning outcomes of an online personalized learning programme involving peer feedback on both teaching plans and teaching videos and found that teachers' learning participation, lesson design skills, and teaching practice improved. Visone (2019) examined a peer feedback-based programme called 'collegial visits'. Based on interviews and rubric scores of 13 participants, positive effects were found on improving participants' instructional practices, increasing teachers' collective ownership of the school, and helping teachers to view colleagues as resources for learning. However, in previous research, the general characteristics of TPD programmes have mostly been focused on, instead of studying in detail the core element of these programmes, i.e. peer feedback. Therefore, a more in-depth understanding of how teachers may learn from peer feedback and how they interact with each other when providing feedback is still needed.

In addition, teacher peer feedback is usually implemented differently in the programme where it is embedded. For example, Iacono, Pierri, and Taranto (2019) examined written peer feedback on teaching plans in a blended course for 166 mathematics teachers and found that the written peer feedback enabled the participating teachers to improve their role as an instructional designer. Another example is a one-year TPD programme studied by Zan and Donegan-Ritter (2014) where peer feedback was implemented monthly in a one-to-one manner to promote reciprocal information sharing and support between peer teachers. Moreover, peer feedback can also be included in some online TPD programme. In an online education programme for physical education teachers, Sato and Haegele (2018) used tools such as bulletin board discussion and E-book reports to help physical education teachers provide written feedback on peers' lesson plans. These various types of

practices of teacher peer feedback may prevent us from building an generic knowledge of how peer feedback is implemented in TPD programmes. Furthermore, these differences highlight the need to integrate previous practices of peer feedback and provide a theory framework that future researchers and practitioners can use to improve their design of teacher peer feedback activities.

Thus this dissertation seeks to generalize the various practices of teacher peer feedback and to contribute to a better understanding of some specific aspects about peer feedback in a Chinese TPD programme. First, a literature review is conducted to model teacher peer feedback implemented in previous research (Chapter 2), and then four aspects of a peer feedback-based TPD programme are studied in the context of Chinese vocational education and training (VET), i.e. the effects of the programme (Chapter 3), teachers' learning mechanisms (cognitive and behavioural processes in learning) through peer feedback (Chapter 4), the appraisals of feedback receivers (Chapter 5), and the characteristics of feedback from expert teachers (Chapter 6).

1.2 Context of this dissertation

1.2.1 Novice teachers and their development in Chinese vocational education

Chinese vocational education and training (VET) is introduced as the main context of this dissertation. Our research topic is very relevant to the unique context, where novice teachers encounter severe problems and many peer feedback-based TPD programmes are implemented.

In China, the reputation of VET is lower than general secondary education, and this cultural prejudice reduces students' intention to enroll in a VET school (Li & Xu, 2018; Gu, 2012). Students who go to VET schools usually have a lower academic performance and learning motivation than those who go to general secondary schools. Research has shown that VET teachers in China encounter more difficulties in motivating students, managing the classroom, adapting their teaching to students' levels, and adjusting their expectations of students' performance (Ma et al., 2018; Ren, 2018). Moreover, many Chinese articles have indicated a low teaching efficacy and high turnover intention of Chinese vocational school teachers (Bian & Zhang, 2019; Tong et al., 2008). For instance, 51.1% of the 276 Chinese VET teachers included in the study of Bian and Zhang (2019) reported an intention

to leave the teaching profession, and it was found that age, working pressure, working intensity, opportunities for promotion, the social status of VET, student numbers and student ability are significantly associated with VET teachers' intentions to leave the profession. Therefore, various peer feedback-based TPD programmes are often carried out in China to help novice VET teachers to survive for their first years. However, these activities have been more frequently studied in general schools (Cui, 2012; Yang, Ran, & Zhang, 2020; Zheng et al., 2019) instead of in VET schools. Thus a deeper look into the practices of teacher peer feedback in the VET context can not only provide us a better understanding of peer teacher feedback in general, but also could show how the specific local context may influence teachers' learning through peer feedback.

1.2.2 The TPD programme in the current study

The empirical studies (Chapters 3-6) in this dissertation are carried out within the Standard Training Programme for Novice Vocational School Teachers in Shanghai (China), which is an annual programme developed by the Shanghai Municipal Education Committee and the Institute of Vocational Education and Training of Tongji University (Shanghai, China). The main purpose of the programme is to improve novice teachers' professional development in order to increase their retention in vocational schools. The programme includes three training modules: 1) Training on teaching practice, which is implemented mainly in the form of peer feedback; 2) theories of VET, which is a series of lectures on the current situation and development of VET, VET pedagogy, and educational psychology in VET; 3) professional ethics, which consists of lectures on the topic of classroom management, theories of moral education, and student-teacher interaction. The programme duration is around nine months, from October to July. Novice teachers attend the programme activities on a Wednesday almost every week except for the holidays.

In regards to the teaching practice module, every novice teacher has three sessions to present their teaching (in the form of teaching video, lesson plan, and live classroom teaching), and then after the presentation, each of the presenters has an individual meeting with a group of two to four expert teachers. During the meeting, expert teachers will provide feedback to the novice teacher based on their observation of the presentation. The title 'expert teacher' is granted by local educational committees because of teachers' long teaching experience and outstanding contribution. Although expert teachers have the title, they can still be regarded as peers because they are mostly full-time in-service teachers, and there is

no formal power relation between expert and novice teachers in the programme.

1.3 Aims and research questions

The main purpose of this dissertation is to provide both an integrated framework for the practices of teacher peer feedback and an in-depth understanding of teacher peer feedback in the Chinese VET context. The first study in this dissertation is carried out in the form of a literature review. It aims at modelling the implementation of peer feedback and providing fundamental information for future studies. The next four empirical studies are conducted in the Chinese VET context, and they separately focus on the effect of a peer feedback-based programme, teachers' learning mechanisms through peer feedback, participants' evaluations on feedback, and the characteristics of expert feedback. The main research questions of the five studies are:

- How is peer feedback implemented in TPD?
- What is the effect of a peer feedback-based TPD programme on novice teachers' sense of efficacy and professional engagement?
- How can novice teachers' learning in novice-expert interaction be characterised in the context of Chinese vocational education?
- How do novice teachers in Chinese vocational education appraise expert feedback in a TPD programme?
- How do expert teachers provide feedback to novice teachers in a TPD programme in the context of Chinese vocational education?

1.4 Conceptual framework

1.4.1 Teacher peer feedback

In this dissertation, we define teacher peer feedback as information shared among teachers regarding aspects of one's teaching performance, teaching plan, and practical issues. This definition is based on Hattie and Timperley's (2007) definition of feedback in general, i.e. "information provided by an agent (e.g., teacher, peer, book, parent, self, experience) regarding aspects of one's performance or understanding" (p.81).

'Teacher peer feedback' is used as the main concept throughout the dissertation because we want to particularly focus on peer feedback activities and provide

in-depth understanding of some specific issues involved in peer feedback, rather than examining the general TPD programme. Moreover, 'teacher peer feedback' can cover various types of teacher learning activities conducted in previous studies. For example, teacher learning activities such as 'peer review of teaching', 'peer evaluation', 'teaching demonstration' and 'peer coaching' (Chien, 2017; Iacono, Pierri, & Taranto, 2019; Jin et al., 2019; Ma, Xin, & Du, 2018; Sanetti et al., 2019) all involve peer feedback as an essential component. By studying the conceptualizations and results from these studies in detail, we can come to a more comprehensive understanding of teacher peer feedback and how it is embedded in the context of a TPD programme.

1.4.2 Novice-expert interaction

In addition to teacher peer feedback, novice-expert interaction is also an important topic in this dissertation, especially for the empirical studies (Chapters 3-6). In our research context, novice-expert interaction can be regarded as a main teacher learning activity involving peer feedback. As reported in section 1.2.2, the empirical studies in this dissertation are all conducted in a TPD programme in the context of Chinese VET, where expert teachers are invited to observe novices' teaching and provide feedback. Expert teachers are regarded as peers in the current context because they are mostly full-time in-service teachers, and there is no formal power relation between expert and novice teachers. The main characteristic of teacher peer feedback in novice-expert interaction is that feedback is always provided to novice teachers by expert teachers who have a lot of teaching experience. The fundamental hypothesis behind this activity is that feedback from a more experienced peer can lead to a positive learning outcome for novice teachers. For example, some studies have proven that experts were able to provide scaffolding at the right moment to improve learners' second language learning (Gánem-Gutiérrez & Gilmore, 2018; Lee, 2008). The unique setting of novice-expert interaction may affect teachers' relationship-building to some extent, however, it is the feedback that matters most, while the matching of peers is only one of many variables.

1.5 Outline of the dissertation

This dissertation is aimed at providing an in-depth understanding of both general and specific aspects of peer feedback in a Chinese TPD programme for VET teachers. Five studies are conducted with a different focus, i.e. implementation

models of peer feedback, effects of the programme, teachers' learning mechanisms through peer feedback, teachers' evaluations of feedback, and the characteristics of expert feedback (see Table 1.1).

Table 1.1 The overview of each chapter in the dissertation

Chapter	Foci	Method	Sample size	Main research questions
2	Implementation models of teacher peer feedback	Systematical review	29	How is peer feedback implemented in TPD?
3	The effect of the TPD programme	Questionnaires	83	What is the effect of a peer feedback-based TPD on novice teachers' sense of efficacy and professional engagement?
4	Learning mechanisms of peer feedback in the TPD context	Open-ended interview and audio recordings of peer interaction	4	How can novice teachers' learning in novice-expert interaction be characterised in the context of Chinese vocational education?
5	Novice teachers' appraisal of the feedback they received	Semi-structured interviews	12	How do novice teachers in Chinese vocational education appraise expert feedback in a TPD programme?
6	Characteristics of feedback provided by expert teachers	Audio recordings of peer feedback sessions	30	How do expert teachers provide feedback to novice teachers in a TPD programme in the context of Chinese vocational education?

Chapter 2 is focused on implementation models for teacher peer feedback. In this chapter, the results from a systematic review involving 29 articles on practices of teacher peer feedback are described. The review study is aimed at generalizing findings from previous studies into implementation models and to identify factors that may affect teacher learning effects. The following two research questions guide the literature review: *1) How is peer feedback implemented in TPD programmes? 2) Which factors affect the effect of teacher peer feedback in the context of TPD?* To

answer these questions, empirical studies were sought published during 2000-2020 with the term 'peer feedback' and 'teacher' in combination (all synonyms of these two terms are also searched, i.e. 'peer evaluation', 'peer review of teaching', 'peer coaching', 'mentor' and 'educator'). The searching process yielded 3873 results, and after two rounds of screening, 29 articles remained, which are analyzed in light of the research questions.

In Chapters 3 to 6, the results of four empirical studies are reported. All the empirical studies are conducted in a TPD programme in the context of Chinese VET, where peer feedback is provided to novice teachers by expert teachers. Specifically, in **Chapter 3**, the effects of a comprehensive TPD programme that includes teacher peer feedback as one of their learning activities are examined. Teachers' sense of efficacy and professional engagement are regarded as the main indicators of teachers' learning outcomes. Two specific research questions are formulated: *1) What is the effect of the TPD programme on novice teachers' sense of efficacy? 2)What is the effect of the TPD programme on novice teachers' professional engagement?* A pre- and post-test control group design is used to study these research questions. Participating teachers (n = 41) in the TPD programme and non-participating teachers (n = 42) with a similar background and teaching experience are both surveyed twice, at the beginning and the end of the programme (the duration is nine months). The differences between teachers who participate and do not participate in the programme are compared by multivariate analysis of co-variance and paired samples *t*-tests.

In **Chapter 4**, the learning mechanisms (i.e. cognitive and behavioral process through learning from peer feedback) of participants in the current TPD programme are explored. Specifically, this study sought to answer the question: *How can novice-teachers' learning in novice–expert interaction be characterised in the context of Chinese vocational education?* Qualitative data from four participating teachers are collected, i.e. audio recordings of one open-ended interview and three novice-expert feedback meetings from each novice teacher (in total, four interviews and 12 feedback meetings were recorded on audio). These four novice teachers are all participants in the TPD programme, and they participate in this study voluntarily. A three step bottom-up coding process adapted from grounded theory is conducted to generalize the qualitative data.

Chapter 5 focuses on novice teachers' appraisal of feedback they received from experts. The research question is: *How do novice teachers in Chinese vocational education appraise expert feedback in a TPD programme?* To answer this question,

12 novice teachers are interviewed about their appraisals of 10 type of feedback (extracted from a pilot study) which are frequently mentioned by expert teachers in the programme. The qualitative data is coded and categorized based on novice teachers' different concerns when appraising expert feedback. This chapter provides an insight into how novice teachers think of the feedback they received from expert teachers during peer feedback.

In **Chapter 6**, the focus shifts the perspective from novice teachers towards the feedback features, and the different features in the feedback dialogues provided by different groups of expert teachers are compared. The following questions guide this article: *1) What are the characteristics of feedback that experts provide in novice-expert interactions in the teacher learning context? 2) How does expert feedback differ between expert teachers of general subjects and expert teachers of vocational subjects? 3) How does expert feedback differ between expert teachers who teach the same subjects as novice teachers and expert teachers who teach different subjects as novice teachers?* Data is collected by recording the peer feedback sessions where a group of expert teachers observes the novices' teaching video and provides feedback. In total, 30 audio records are collected, and each one lasted 30-40 minutes. The feedback feature framework (Nelson & Schunn, 2009) is used to code the feedback dialogues. According to this framework, each feedback dialogue can be characterized based on eight different features. Based on the percentages of eight features in each dialogue, descriptive statistics and an independent *t*-test are used to compare the differences between the feedback provided by different types of expert teachers.

Finally, **Chapter 7** provides a summary and general discussion of the whole dissertation.

Chapter 2

Implementation Models of Teacher Peer Feedback: A Systematic Review

This chapter was submitted in an adapted form as:

Jin, X., Tigelaar, D., van der Want, A., & Admiraal, W. (under review). Implementation models of teacher peer feedback: A systematic review.

Abstract

Although the effects of teacher professional development (TPD) programmes involving peer feedback have been previously examined, peer feedback has been implemented differently in these programmes. Consequently, it is necessary to provide an overview of how peer feedback is implemented in TPD programmes, and which factors determine teacher-learning effects. Based on a systematic literature search, 29 articles were selected and reviewed. Four implementation models of teacher peer feedback are distinguished (i.e., lesson study-based peer feedback, research-initiated peer feedback, supervisor-guided peer feedback, and self-regulated peer feedback). Meanwhile, we identified five factors that influence teacher learning through peer feedback (i.e., characteristics of participants, training and supervision, schedule and duration, support and tools, and characteristics of feedback). These findings lead to suggestions on how to further improve the implementation of peer feedback in TPD programmes for teachers.

2.1 Introduction

Peer feedback is a commonly implemented element in many teacher professional development (TPD) programmes, and its effect on teacher learning has been examined in previous studies (Chien, 2017; Iacono, Pierri, & Taranto, 2019; Jin et al., 2019; Ma, Xin, & Du, 2018; Sanetti et al., 2014). These studies not only indicate the positive effects of teacher peer feedback but they also show different practices and various factors that influence teacher learning through these peer-feedback activities. These practices and influential factors have led to many different descriptions of peer feedback, without giving much information about how it has been included in the programmes. Therefore, to improve the future implementation of peer feedback in TPD programmes, a more generalised understanding of these different practices is needed. In this study, the literature on teacher feedback will be reviewed to build implementation models (i.e., the structure and procedure of peer-feedback activities, which consists of different aspects of the practice of peer feedback, such as the contexts, components, phases, and participants) and to identify those factors that may affect teacher learning through these programmes.

2.2 Peer feedback in TPD programmes

In the current study, we use the term 'teacher peer feedback' to cover all teacher-learning activities that include peer feedback as the main component. To do so, we further defined teacher peer feedback according to Hattie and Timperley (2007), who defined feedback as "information provided by an agent (e.g., teacher, peer, book, parent, self, and experience) regarding aspects of one's performance or understanding" (p. 81). In this definition, two main elements can be identified: the agent and the aspects of performance on which the feedback is provided. In teacher peer feedback, the feedback agent is a teacher who provides feedback to peers based on not only teaching performance and understanding but also their teaching plans and practical issues (Ma, Xin, & Du 2018; Zan & Donegan-Ritter, 2014).

Teacher peer feedback is a common component in many TPD programmes and it has been found to support teachers' improvement of teaching. For example, Ma, Xin, and Du (2018) examined the learning outcomes of an online personalised learning programme involving peer feedback based on both teaching plans and teaching videos. Based on the analysis of peer feedback conversations, revised lesson plans, and teaching videos, the authors found that peer feedback improved the teachers' programme participation, teaching design skills, and in-practice teaching abilities.

Iacono, Pierri, and Taranto (2019) embedded written peer feedback on a teaching plan in a blended course for mathematics teachers, and found that feedback on their teaching plan enabled the teachers to improve their instructional design skills. Briere et al. (2015) investigated the effects of a within-school consultation intervention, where veteran teachers provided performance feedback to new teachers. The authors found that new teachers increased their rate of specific praise. In summary, the results of these studies show that peer feedback can be an effective and crucial element in TPD programmes.

Teacher peer feedback is generally implemented differently according to the specific programmes that it is embedded in. Within these programmes, different factors are found to affect teacher learning through peer feedback. For example, Chien (2017) conducted a study based on a programme called 'teaching demonstration' where a group of in-service English teachers observe each other's teaching and provide feedback to each other under the supervision of a professor in education. Based on this programme, Chien (2017) found six factors that affect teacher peer feedback, as follows: handbooks for observations, the supervisor's expertise, the observed teachers' expertise, the observers' discussions, location, and training workshops. Jin et al. (2019) studied a teacher-learning programme that involves peer feedback in the form of 'novice–expert interaction', where expert teachers (with more teaching experience) reviewed novice teachers' teaching videos and provided constructive feedback. Given that their study was conducted in a Chinese vocational education context, Jin et al. (2019) argued that the main influential factors were Asian culture, vocational education context, and the experience gap between expert and novice teachers. Sanetti et al. (2014) used performance feedback from a special-education teacher to help three eighth-grade teachers to promote their students' self-monitored learning. They also discussed the influence of time scheduling, duration of the peer feedback-based programme and contextual features on teachers' learning through peer feedback. In addition, Jao (2013) studied the experiences of elementary mathematics teachers in a peer-coaching programme, where peer feedback was implemented by an iterative learning cycle that included a pre-conference meeting, in-class observation, and a post-observation conference meeting. An observation template and peer interview protocol were used in the observation phase and the post-observation conference, respectively. Jao (2013) found that the main factors affecting the teachers' learning outcomes were the environment where the conferences were held, the schedule, the participant's initial fear, and the use of a protocol/template. Although this diversity

in the implementation and influential factors of peer feedback provide a valuable insight into peer feedback within certain contexts, a comprehensive understanding of how peer feedback is implemented in TPD programmes is still lacking. Nevertheless, this comprehensive understanding is necessary because it can provide an analytical framework for future research and it can provide reference for the future TPD programmes involving peer feedback.

In this literature review, we aim to generalise the previous practices of teacher peer feedback into implementation models and we hope to identify any factors that may affect the teacher-learning effects. Consequently, two research questions are formulated:

- How is peer feedback implemented in TPD programmes?
- Which factors affect the effect of teacher peer feedback in the context of TPD?

2.3 Method

2.3.1 Search terms and databases

To guide our research procedure, we followed the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) standards (Moher et al., 2009). Figure 2.1 shows the process of the research method of the current review study. The Web of Science portal was used to search the articles, and all of the databases on the portal were included (i.e., Web of Science Core Collection, Current Contents Connect, KCI-Korean Journal Database, MEDLINE, Russian Science Citation Index, and SciELO Citation Index). We set the following pre-conditions before the search: the language of the search results is English and the time span is from 2000 to 2020. For the search terms, we used ‘peer feedback’ and all its synonyms (i.e., ‘peer assessment’, ‘peer review’, ‘performance feedback’, ‘peer evaluation’, ‘peer coaching’, and ‘peer observation’), combined with ‘teaching’, ‘teacher’, ‘mentor’, and ‘educator’, respectively. The search process yielded 3873 results in total. After removing the replicates, 2638 unique records remained.

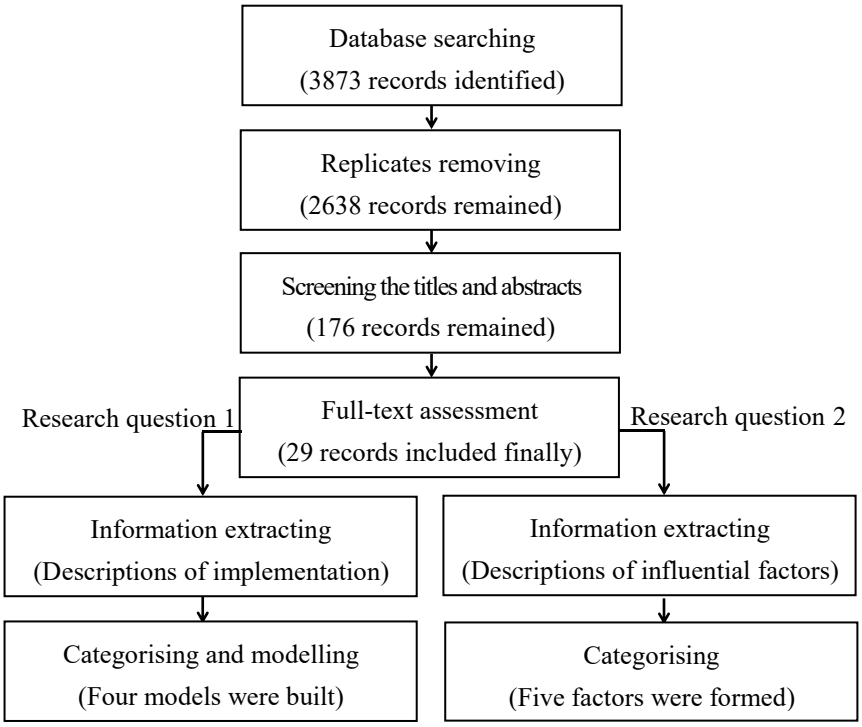

Figure 2.1 The general process of the research method

2.3.2 Screening titles and abstracts

The titles and abstracts of the identified articles were screened according to the following criteria: 1) the included articles should be empirical studies involving teacher peer feedback, 2) the included teacher peer-feedback activities should be developmental in nature (i.e., the peer feedback should be used to improve teachers' teaching practice), 3) the feedback provider and receiver in the research should both be in-service teachers (note that 'teacher' was perceived broadly in the current study, which includes people whose full-time job involves interacting with students and supporting the growth of students in a school, such as special educators, paraprofessionals, mentors/tutors in vocational schools and teachers in all different school subjects), 4) teachers should work in primary or secondary schools because teachers in higher education usually spend a large amount of time researching rather than interacting with students.

The screening process was carried out by the first author by reading the titles and

abstracts of the 2638 articles that we identified earlier. After the screening process, 176 articles were selected.

2.3.3 Full-text assessment

Given that the title and abstract may not provide enough information for screening, another round of selection was conducted based on the assessment of the full text. When assessing the full text, we set additional inclusion criteria based on our two research questions. The first research question focuses on the implementation of peer feedback, which includes articles that provide information on how teacher peer feedback was implemented in the method or context sections; thus, we checked the details of the context and method section of these articles. The second research question focuses on factors that influence the teacher-learning effects, thus we checked the results and discussion section of these articles to ensure that they provided information on the influential factors. Finally, a total of 29 articles remained.

2.3.4 Analysis of included literature

To answer the first research question ("How is peer feedback implemented in TPD programmes?"), we aimed to build implementation models based on existing practices of peer feedback. Thus, we first extracted all of the descriptions of the implementation procedures from the included articles. These descriptions were then labelled based on the characteristics (e.g., particular implementation steps, roles of participants, support and tools, and programme context) of the implementation of the peer feedback in the studies. These labels were further categorised into seven characteristics based on their similarity. Finally, we identified the dominant characteristics and divided the included teacher peer-feedback activities into four different models.

With regard to the second research question ("Which factors affect the effect of teacher peer feedback in the context of TPD?"), the result and discussion sections of the included articles were reviewed. In total, 72 factors were labelled throughout the 29 reviewed articles, which were then divided into eight types of factors, which are: 'characteristics of participants', 'training and supervision', 'schedule and duration', 'support and tools', 'characteristics of feedback', 'organisational management and leadership', 'relationship between participants', and 'group size'. In our results section, only the first five are elaborated because these are the most commonly recognised factors (i.e., shared by more than one-third of the reviewed articles, or 10

articles) that affect teachers' learning through peer feedback.

2.4 Results

2.4.1 Implementation models

Before presenting the four models of peer feedback, we will present the seven implementation characteristics that underlie these models, namely: 'work cycle', 'initial instruction', 'fixed role', 'support and tools', 'learning objectives', 'process supervisor', and 'programme context'.

Work cycle means that peer feedback is implemented through an iterative procedure, requiring that participants go through the cycle at least twice, and every new cycle is based on the results of the last round of activity.

Initial instruction refers to a workshop-style instruction at the beginning of the programme, which provides participants with the basic principles and requirements of how peer feedback is conducted. However, constant supervision during the process is not labelled as initial instruction.

A **fixed role** indicates that participants are pre-assigned either as coach (feedback provider) or coachee (feedback receiver) by programme staff, and their roles do not switch during the programme.

Support and tools refer to three types of support used during the process of peer feedback, as follows: 1) digital environment or platform of the programme, 2) presentation tools supporting the presentation of teaching performance of the observed teachers (e.g. PowerPoint, video and audio equipment, and teaching plan form), and 3) feedback provision tools, which are used to support the observing teachers to provide feedback (e.g., checklists, observation schemes, bugs in ear equipment, and conversation prompts).

Four types of **learning objectives** of these TPD programmes are distinguished, as follows: 1) 'self-decided', which is the individualised learning objectives that participants can decide themselves based on what they want to improve through the peer feedback; 2) 'pre-set general', which is a general and same learning objective pre-set by the programme organiser for all the participants (e.g. improve teachers' teaching expertise); 3) 'pre-set specific', which is a specific and same leaning objective that is pre-set by the programme organiser for all participants (e.g. increase the amount of inquiry in the classroom); and 4) 'learning objectives', which are based on diagnosis where participants set their personalised learning objectives based on an analysis of their teaching experience.

The **process supervisor** is a facilitator of peer feedback meetings, who is in charge of facilitating the communication, pairing peer dyads, provides a guideline for observation focus or provides initial instruction to participants. The process supervisor is usually a researcher or staff member of the TPD programme. In Chien (2017), expert teachers and professors were invited to supervise the process.

Programme context is the context where teacher peer feedback is being conducted, which can be divided into three types: 1) peer feedback as a detached teacher-learning activity with a specific focus on peer feedback, 2) peer feedback as an embedded component in a comprehensive TPD programme where other learning activities (e.g. workshops on pedagogy) are also involved, and 3) peer feedback initiated by researchers with a specific focus on examining the change in teaching behaviour (e.g. increasing teachers' specific praise).

Table 2.1 lists the seven implementation characteristics in regards to the 29 reviewed articles. The presence of the characteristics in each article is labelled as *. Based on the seven characteristics in the practices of peer feedback, the 29 studies were clustered into four implementation models.

Table 2.1 The implementation characteristics of all peer-feedback activities in reviewed studies

Implementation model	Author	Work cycle	Initial instruction	Fixed role	Support and tools			Learning objectives	Process supervisor	Programme context
					Environment	Presentation	Feedback provision			
Lesson study-based peer feedback	Artigliere & Baecher (2016)	*	*	*				self-decided	researcher	detached
	Butler & Yeum (2016)	*			*	*		pre-set general	no	detached
	Brix, Grainger, & Hill (2014)	*						self-decided	no	detached
	Jao (2013)	*					*	self-decided	no	detached
	Pearce *et al.* (2019)	*		*				pre-set specific	programme staff	embedded
	Thurlings *et al.* (2012a)	*	*		*	*	*	self-decided	programme staff/no[a]	detached
	Zwart *et al.* (2009)	*	*					pre-set specific	programme staff	detached
Research-initiated peer feedback	Briere *et al.* (2015)		*	*		*	*	pre-set specific	researcher	research-based
	Brock & Carter (2016)		*	*				pre-set specific	researcher	research-based
	Ottley *et al.* (2017)		*	*			*	pre-set specific	researcher	research-based
	Sanetti *et al.* (2014)		*	*			*	pre-set specific	researcher	research-based
	Walker, Douglas, & Brewer (2020)		*	*			*	pre-set specific	researcher	research-based

Table 2.1 (Continued)

Implementation model	Author	Work cycle	Initial instruction	Fixed role	Support and tools			Learning objectives	Process supervisor	Programme context
					Environment	Presentation	Feedback provision			
Supervisor-guided peer feedback	Chien (2017)		*				*	pre-set general	expert teacher or professors	detached
	Edwards & Steed (2020)			*			*	pre-set general	programme staff	embedded
	Herbert & Bragg (2020)		*				*	pre-set specific	researcher	embedded
	Nami, Marandi, & Sotoudehnama (2016)				*	*		self-decided	researcher	embedded
	Rivera-McCutchen & Panero (2014)			*			*	self-decided	programme staff	detached
	Thurlings *et al.* (2012b)					*	*	self-decided	programme staff	detached
	Thijs & van den Berg (2002)		*				*	pre-set specific	researcher	embedded
	Visone (2019)						*	pre-set specific	programme staff	detached
	Zwart *et al.* (2008)		*					pre-set specific	researcher	embedded

Table 2.1 (Continued)

Implementation model	Author	Work cycle	Initial instruction	Fixed role	Support and tools			Learning objectives	Process supervisor	Programme context
					Environment	Presentation	Feedback provision			
Self-regulated peer feedback	Charteris & Smardon (2016)					*		pre-set general	no	embedded
	Fallon & Kurtz (2019)			*			*	pre-set specific	no	detached
	Iacono, Pierri, & Taranto (2019)				*		*	pre-set specific	no	embedded
	Karagiorgi (2012)						*	pre-set general	no	detached
	Ma, Xin, & Du (2018)			*/-[b]	*		*	based on diagnosis	no	embedded
	Sato & Haegele (2018)				*			pre-set general	no	embedded
	Zan & Donegan-Ritter (2014)						*	pre-set specific	no	embedded
	Zhang, Liu, & Wang (2017)				*			pre-set specific	no	embedded

Note: [a] indicates there are more than one group of participants, and some groups have a programme staff as process supervisor but some groups do not.

[b] indicates there are more than one group of participants, and some groups have a fixed role of participants but some groups do not.

Lesson study-based peer feedback

Lesson study is a well-known TPD activity that centres on the collaborative study of live classroom lessons. The distinguishing feature of a lesson study is the iterative cycle of collaborative lesson design, lesson presentation, and reflection (Lewis, Perry, & Murata, 2006). In the current study, we named the teacher peer-feedback activities with an iterative work cycle as 'lesson study-based peer feedback'. Studies that used the term 'lesson study' without this iterative work cycle are not categorised into this type. For example, Nami, Marandi, and Sotoudehnama (2016) defined their programme as 'lesson study' but they only conducted the peer feedback procedure once, without a refined learning objective and a new round of observation. Figure 2.2 portrays the work cycle in the lesson study-based peer feedback model. The lesson study-based peer feedback usually starts with an introductory meeting, in which the participating teachers get to know each other and set their learning objectives with the help of their peers. In some cases, the learning objectives are pre-set by the programme organiser (i.e., Pearce et al., 2019; Zwart et al., 2009). During the introductory meeting, the researcher or process supervisor could also do the instruction; although only three of the included articles describe an initial instruction. After the learning objectives are set, the teachers plan the lesson together or alone. Presentation is the step where the teachers present their work, which could be live classroom teaching (Jao, 2013) or teaching video (Thurlings et al., 2012a). During the presentation and feedback provision phases, most of the lesson study-based peer feedback does not require fixed roles from participants: a team of teachers usually works reciprocally and takes turns playing the roles of feedback receiver and provider. Finally, after receiving feedback, the teachers adapt their learning objectives according to the feedback received from their peers.

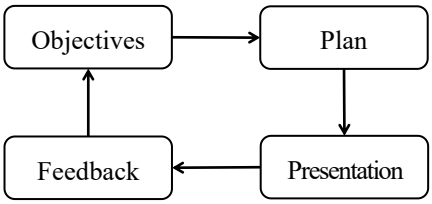

Figure 2.2 The lesson study-based peer feedback model

Research-initiated peer feedback

The second type of teacher peer feedback is distinguished based on its programme context, where peer feedback is conducted as part of a research project instead of being part of a TPD programme. These research-initiated programmes are included in the current review because peer feedback in these programmes is used to improve the teachers' teaching behaviour or strategies, and the effects of feedback is subsequently examined. The research-initiated peer feedback model can be considered as the most structured peer feedback type compared to the other three models (see Figure 2.3) because all implementation characteristics (e.g., initial instruction, the fixed role of participants, and pre-set specific learning objectives) are set by researchers who launched the programme. The learning objectives in this type of peer feedback are very specific (depending on the research aim) and they are usually focused on teaching behaviour. For example, some of the objectives are to increase the teacher's specific praise (Briere et al., 2015) and improve the teacher's use of strategies to promote their students' interaction with their disabled peers in the classroom (Brock & Carter, 2016). Researchers or university experts often take the role of process supervisors. They first introduce the learning objectives to teachers and they then conduct an initial instruction in which the process supervisor matches the coach (usually a more experienced teacher) and coachee (usually novice teachers), clarifies the learning objectives and guides coaches on how to provide feedback. Compared to the lesson study-based peer feedback model, the feedback provided in the research-initiated peer feedback model is usually very specific, decontextualised and performance-based to stimulate particular behaviour, and it does not aim to refine the learning objectives. Support and tools are frequently used to provide performance feedback, such as 'bug in ear' equipment (Ottley et al., 2017), a training protocol with different prompts (Sanetti et al., 2014) and an Excel graphing template to present the teachers' performance (Briere et al., 2015). Another unique element of this type of peer feedback programme is the frequent use of probes, which are used to monitor the teachers' leaning of the targeted behaviour.

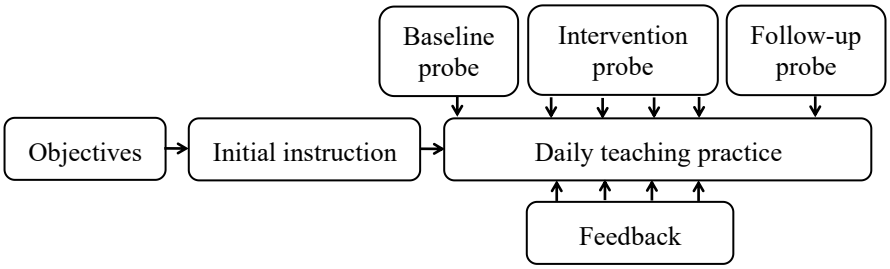

Figure 2.3 The research-initiated peer feedback model

Supervisor-guided peer feedback

Figure 2.4 indicates the model of 'supervisor-guided peer feedback'. A typical characteristic of this model is the involvement of a process supervisor, who can also be called a 'process director' or 'process instructor'. This supervisor is actively involved in almost all phases of the process of teacher peer feedback. Supervisor-guided peer feedback usually starts with instruction provided by a supervisor. During the instruction, the supervisor will help the participants to become acquainted with the peer feedback procedure. Meanwhile, the participating teachers decide together with the supervisor which teaching aspects they want to develop. In some cases, learning objectives are self-determined, but in most cases the supervisor sets the learning objectives beforehand. In the phase of presentation and feedback provision, the process supervisors can help with making schedules (Visone, 2019), group the coach and coachees (Edwards & Steed, 2020), and explain the tools that can be used during peer feedback (Chien, 2017). In most situations, process supervisors attend the feedback provision meetings as a facilitator, instead of a feedback provider. As a facilitator, they help to guide the conversations among teachers and refocus the team on the main issues when necessary (e.g., Herbert & Bragg, 2020).

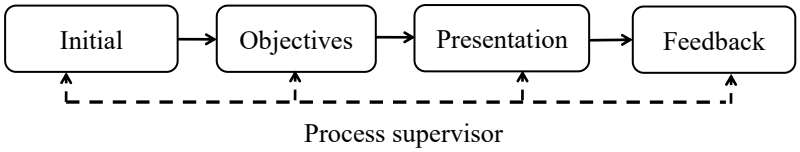

Figure 2.4 The supervisor-guided peer feedback model

Self-regulated peer feedback

Self-regulated peer feedback can be perceived as the most open model for implementing teacher peer feedback. No process supervisors are involved and requirements on how to provide feedback to each other are less pre-structured when compared to the other models. As reported in some programmes, such as in Karagiorgi (2012), peer feedback was arranged at convenient times according to the teachers' schedule. The teachers can choose their peers by themselves, and they can decide whether to use some support and tools during observation and feedback provision. This means teachers are regulating the entire process of peer feedback. Only three steps are included in this model (i.e., objectives, presentation, and feedback; see Figure 2.5), and there is a variety in the practices of each phase. The learning objectives in the self-regulated peer feedback model could be both general (e.g., establish the school as a learning community; Karagiorgi, 2012) and specific (e.g., improve the teacher's skill in designing student-cantered ICT-integrated lessons; Zhang, Liu, & Wang, 2017), and personalised objectives based on diagnosis are also included. During the presentation phase, the teaching performance can be presented in various ways, not only teaching videos or live classroom visits but also in teaching plans (Ma, Xin, & Du, 2018) and verbal descriptions of issues in teaching practice (Zan & Donegan-Ritter, 2014). In a self-regulated peer feedback programme, peer feedback often has a broad definition; for example, Zan and Donegan-Ritter (2014) defined feedback as 'a reciprocal sharing of information and support between peers'. Thus, feedback is also provided in different forms, such as face-to-face dialogical feedback (Fallon & Kurtz, 2019) and short written comments online (Sato & Haegele, 2018). Another characteristic of the self-regulated peer feedback model is the use of online learning platforms, which provide more flexibility for participants on when and how to access peers' teaching presentation and feedback. An online teacher-learning programme is applied in four out of the eight studies categorised as self-regulated peer feedback (Iacono, Pierri, & Taranto, 2019; Ma, Xin, & Du, 2018; Sato & Haegele, 2018; Zhang, Liu, & Wang, 2017).

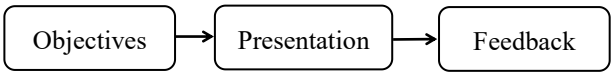

Figure 2.5 The self-regulated peer feedback model

2.4.2 Factors that influence teachers' learning effects

As a response to our second research question ("Which factors affect the effect of teacher peer feedback in the context of TPD?"), the result and discussion section of the included articles were reviewed, and eight influential factors were extracted in total. These factors are 'characteristics of participants', 'training and supervision', 'schedule and duration', 'support and tools', 'characteristics of feedback', 'organisational management and leadership', 'relationship between participants', and 'group size'. However, we only elaborate the first five in this section because the other three factors were discussed relatively less in the included articles (i.e., less than one-third of the articles).

Characteristics of participants

The participant's characteristics were the most frequently mentioned as being relevant to the teachers' learning results. Three aspects were indicated by previous researchers. The first aspect is the teaching experience of peer-feedback actors. In an online programme, Ma, Xin, and Du (2018) compared the effect of two groups of participants, where one group receives feedback from three expert teachers (with longer teaching experience than the participants) and the other group receives feedback from peer teachers (with equal teaching experience as the participants). These authors found that the peer coaching-based learning approach had a larger effect on teachers' willingness to participate in professional learning and lesson design skills than the expert coaching-based learning approach. They concluded that similarity in the teachers' experience may make it easier for the participants to express and accept comments. Related to teaching experience, the teachers' knowledge (e.g., technological knowledge, pedagogical knowledge, and content knowledge) is also considered necessary for participating teachers to make the best use of peer feedback to promote their professional development (Zhang, Liu, & Wang, 2017).

The second aspect of participants' characteristics pertains to the competencies of peer-feedback actors. Different kinds of competencies of participating teachers are required to be able to conduct a successful peer feedback-based programme. For example, dialogic competence is identified by Butler and Yeum (2016) as one of the most important abilities of the participants because it allows them to realise their own biases during observation, create dialogic space and engage in mutual meaning-making. The abilities of observation and diagnosis are also stressed by

Walker, Douglas, and Brewer (2020) to indicate that the participants need to be able to determine whether their peers need to improve performance in particular aspects and whether they should offer feedback based on their observations.

The third factor associated with participants' characteristics is their willingness to participate in the peer-feedback activities and their motivation for professional development. For example, Pearce et al. (2019) found that the success of peer coaching is interconnected with the teachers' willingness to share critical reflections about their daily practice during the post-observation conferences. Jao (2013) also argued that the teacher's overwhelming desire to improve their teaching can help them to overcome their initial fear of having an observer in the classroom and reinforce their belief in the effect of peer feedback.

Training and supervision

The participants' training and supervision are another important factor that is related to the teachers' learning effects. Initial instruction on the basic peer interaction principles, abilities of observation, and effective communication skills is recommended in many of the reviewed studies (e.g., Brock & Carter, 2016; Nami, Marandi, & Sotoudehnama, 2016; Zhang, Liu, & Wang, 2017). This is vital because the participants need to be able to take the role of a reviewer who should ensure that their feedback is in line with the expectations of the programme organiser and those of the observed teachers (Iacono, Pierri, & Taranto, 2019). Moreover, Walker, Douglas, and Brewer (2020) argue that with prior training on peer interaction, the teachers may encounter less uncomfortable situations in providing feedback to their peers and experience fewer troubles in building relationships with each other.

In addition to formal workshop-style training at the beginning of a programme, continuous supervision during the whole process of peer interaction is also stressed in many studies. For example, Thurlings et al. (2012a) compared the effects of a peer feedback-based TPD programme, which consists of one virtual group and three face-to-face groups. Their findings show that the virtual group was less effective than were the face-to-face groups. The authors attributed the effectiveness of face-to-face groups to the process supervisor (only the face-to-face groups were equipped with a process supervisor). The authors recommend that process supervisors should actively steer the peer feedback process by asking guiding questions, reflecting explicitly on the coaching behaviour of the participants, and contributing when peer feedback tends to become less effective. The importance of process supervision was also recognised by the participants in Chien's (2017)

programme. The participants mentioned that the hostess (process supervisor) helped them to focus on the main topic, ask guiding questions, provide supplementary materials, and summarise the discussions, which resulted in better learning outcomes.

Schedule and duration

The schedule and duration factor refers to how the time arrangement may influence teachers' learning through peer feedback. The results from the reviewed articles in the current study reveal that the first concern about time is the participant's schedule. Brix, Grainger, and Hill (2014), for example, argue that the teacher's busy schedule may block them from participating in peer-feedback activities, which may reduce their learning effect. Therefore, the authors recommend allocating release time for the peer feedback process and to reallocate the responsibilities for participants who have administrative tasks to keep them attending a long-term peer-feedback activity. Furthermore, Sanetti et al. (2014) examined the effect of performance feedback on improving the teacher's adherence to an intervention on students' preparedness, engagement, and homework completion. They regarded scheduling difficulties as a more likely reason for an unstable treatment adherence than skill or knowledge deficits.

The second consideration in regards to time is the duration of the peer feedback programme. In their discussion of an in-service teacher education course, Nami, Marandi, and Sotoudehnama (2016) suggested that the limited time of the entire programme may have reduced the effect of peer feedback. The authors state that better results might have been obtained if the teachers had an opportunity to engage in the programme for a longer period. A positive example comes from Pearce et al. (2019) who studied a two-year peer-coaching programme. They argue that a long-time span maximised the benefits of the peer-feedback activities in their study because it allowed the participants to build relationships and solve problems with peers gradually along the way. In addition to the whole programme, the duration of specific phases of peer-feedback activities is also important. For example, Edwards and Steed (2020) found that many participating teachers expected a longer duration of observation before providing feedback to peers because they need more time to formulate their feedback based on their observation.

Support and tools

As indicated in Table 2.1, the effects of support and tools can be distinguished in

three aspects. The first aspect entails environment support (mostly, online portals), which is used in many of the included programmes to facilitate and monitor the peer feedback process. The merits of online environment support are identified in these studies, such as providing teachers with flexibility in when they access peers' presentation and feedback (Butler & Yeum, 2016), creating a safe space for exchanging feedback (Butler & Yeum, 2016), and allowing the process director to manage and monitor the learning process of each teacher (Iacono, Pierri, & Taranto, 2019). However, the weaknesses and disadvantages of these environmental supports have also been found. For example, a safe anonymous environment is likely to block teachers from obtaining the personal and contextual information that they need to create meaningful dialogues and critical friendships (Butler & Yeum, 2016). This argument is in line with Thurlings et al.'s (2012a) results, who found that teachers in face-to-face groups provided more effective feedback than teachers in a virtual group.

In the second aspect, during the presentation phase, tools such as video and audio devices, PowerPoint, and lesson design forms are commonly used to support observed teachers' presentation (Butler & Yeum, 2016; Charteris & Smardon, 2016; Nami, Marandi, & Sotoudehnama, 2016). These facilities are used to present important evidence on how observed teachers perform in their classroom. This makes it possible for observing teachers to base their feedback on observations grounded in their peers' practice, and thus improve the quality of their peer feedback (Zan & Donegan-Ritter, 2014). Furthermore, the use of presentation tools can also support the presenting teachers' self-reflection.

In the third aspect, with regards to supporting feedback provision, guidelines, discussion logs, conversation prompts and observation forms are considered to be helpful tools for promoting teachers' communication during the post-observation meeting. For example, in a peer-coaching programme for primary mathematics teachers, Jao (2013) provided a conversation guideline consisting of a series of questions for observing teachers to provide high-quality feedback to their peers. She suggested that the use of this guideline can help the participants to focus more on their peers' teaching practice and make the teachers acquainted with the peer feedback process. Sato and Haegele (2018) used another tool, called 'bulletin board discussion logs', to increase social interactions among teachers. This tool provides participants with opportunities to post short comments on a course webpage at any time. The positive effect of this tool was acknowledged by most of their participants.

Characteristics of feedback

Characteristics of feedback refer to how teachers provide feedback to each other and what elements are included in feedback conversations. Concerning the way in which feedback is provided, many well-recognised characteristics were identified; for example, effective feedback is goal-directed, specific, constructive, corrective, and balanced between positive and negative comments (Edwards & Steed, 2020; Sato & Haegele, 2018; Thurlings et al., 2012a). Moreover, the optimal balance between being critical and polite is also regarded an important feature of effective feedback according to Butler and Yeum (2016). This means that feedback should be formulated in a polite and friendly way so that all participants can accept it, and also in a way that the participants can clearly understand what is expected of them to improve their teaching practice. In addition, the elements included in a peer feedback dialogue also affect teacher learning from peer feedback. For example, guiding questions, solution-focused questions, continuous questioning, summarising, and acknowledging were found to be helpful during the teacher peer feedback, while evocative questions, hinting, judging, finishing sentences, and providing own examples are considered to be ineffective (Thurlings et al., 2012b).

2.5 Discussion and conclusion

The current review study has resulted in four implementation models of TPD programmes (i.e., lesson study-based peer feedback, research-initiated peer feedback, supervisor-guided peer feedback, and self-regulated peer feedback) and five factors that influence teacher learning (i.e., characteristics of participants, training and supervision, schedule and duration, support and tools, and characteristics of feedback). Based on the findings, three viewpoints will be discussed in this section.

The first contribution of the current study is that we categorised the previous literature on teacher peer feedback into four implementation models. This finding responds to the need to integrate different teacher-learning activities with peer feedback, as mentioned in the available studies. For example, Brix, Grainger, and Hill (2014) argued that some of these terms are synonyms, and they related their study on peer review of teaching to the similar activities, such as peer review of teaching, peer evaluation and peer coaching. Therefore, the four implementation models provide a strong framework for future practitioners and researchers to locate the peer feedback-based teacher-learning activities that they conducted. It also

provides information about the seven characteristics that are involved in implementing different types of peer feedback. Moreover, all four models have a positive effect on TPD, although different models may have their unique contribution to particular aspects of teachers' learning. For example, teachers reported that they gained academic support, technical support, emotional support and reflective support from peers in a programme with self-regulated peer feedback (Zhang, Liu, & Wang, 2017), and new teachers' rate of specific praise was found to increase after receiving performance feedback from veteran teachers in a research-initiated peer feedback programme (Briere et al., 2015). The unique benefits of different peer feedback models may be caused by the different combination of the seven characteristics underlying these models. Consequently, future research should focus more on the seven characteristics and their correlation with teacher-learning outcomes to enrich the understanding of the function of the four models.

The second result in the current study is that it yielded five influential factors in peer feedback. This shows that a diversity of factors are associated with the effectiveness of peer-feedback activities in TPD programmes, and this diversity makes it difficult for programme staff to design optimal peer-feedback activities. In a previous study, it was found that the complex learning tasks in teacher-learning programmes may block activity designers from predetermining what resources the participants will need (De Hei et al., 2016). Therefore, we argue that participants, programme organisers and process supervisors should work together to explore the most effective and adaptive ways to implement peer feedback during the programme. In other words, peer feedback should be conducted in an adaptive and adjustable way. This requirement for TPD programmes was also proposed by other researchers. For example, Denton and Heiney-Smith (2020) have emphasised the importance of matching mentors and mentees, developing a proper way of communication, and adjusting mentors' expectation of mentees in a TPD programme. According to the five factors found in this study, the adjustability and adaptiveness can be achieved with an accurate match of participants, the training and supervision of the participants, and providing adequate time to develop a strong relationship between participants (Edwards & Steed, 2020; Nami, Marandi, & Sotoudehnama, 2016; Pearce et al., 2019).

Third, the specific model type 'research-initiated peer feedback' should be discussed because of its unique programme context. In the strict sense, this model cannot be regarded as 'peer feedback in TPD' because this type of peer feedback is

mainly based on research that involves a well-structured activity setting and a small number of participants. However, the studies that are characterised as 'research-initiated peer feedback' all met our inclusion criteria and do contribute to the knowledge of how teachers may improve their teaching behaviour based on peer feedback. Thus, we categorised the research-initiated peer feedback as a unique model, and this model emphasises the value of frequent and stimulating feedback in teachers' learning of specific teaching behaviour. We argue that research-initiated peer feedback model is particularly promising and may be implemented in TPD programmes that target specific teaching behaviours, strategies, and methods as their main learning objectives.

2.5.1 Implications

Considering the multiple types of implementation models and the widely proven positive effects of these different models in the available research, it is clear that different models have unique characteristics and contributions. This also means that it is essential to choose the most suitable model when implementing teacher peer feedback, rather than identifying the perfect ones in general. To choose the most suitable model, we suggest that organisers of TPD programmes should conduct a precise analysis of learning objectives, participants' competences and experience. For instance, if the target learning objective is very specific or behaviour focused, then the research-initiated peer feedback model may be more appropriate; while if the participants are relatively experienced and possess a certain extent of self-regulation and communication skills, then the lesson study-based peer feedback and self-regulated peer feedback approach may be the most suitable choice. Supervisor-guided peer feedback would be a better choice for novice teachers with less experience in participating in learning programmes.

We recommend that programme organisers should consider the five types of factors. In general, some tips related to the five types of factors are: 1) matching teachers with respect to their competencies, teaching experience and learning motivation; 2) providing enough instruction for participants before and throughout the peer feedback process; 3) schedule the programme according to the participants' convenience and arrange relatively long-term programmes to provide adequate time for the participants to develop their relationship and feedback skills; 4) analyse the merits and shortcomings of support and tools, and then select them according to the goal of the programme; and 5) formulate feedback in an acceptable, but critical, way. In addition, these influential factors should be adjusted and monitored continuously

to optimise the practice of peer feedback-based TPD programmes. This requires teacher educators and programme organisers to frequently scrutinise, interview or survey participants with regards to their learning needs, changing expertise, attitude, motivations, and expectations, to adequately adapt peer feedback to the participants.

2.5.2 Concluding remark

This article provides a systematic review of 29 studies on peer-feedback activities among teachers. Four types of implementation models are categorised, and five types of factors are found. The huge diversity in these implementation models and influential factors not only provide an overall view of how peer feedback is implemented in TPD programmes but also contributes to future research and practice by exploring guidelines to optimise the implementation of peer-feedback activities.

Chapter 3

Effects of a Teacher Professional Development Programme in Chinese Vocational Education on Efficacy and Professional Engagement of Novice Teachers

This chapter was submitted in an adapted form as:

Jin, X., Tigelaar, D., van der Want, A., & Admiraal, W. (under review). Effects of a teacher professional development programme in Chinese vocational education on efficacy and professional engagement of novice teachers.

Abstract

The self-efficacy and professional engagement of novice teachers were examined in the context of a teacher professional development (TPD) programme in Chinese vocational education and training (VET). A pre- and post-test control group design was used. The experimental and control groups contained 41 and 42 novice teachers, respectively, who were mostly in the first year of their career. Multivariate analysis of co-variance and paired samples *t*-tests showed that teachers participating in the programme reported a significantly higher value for their efficacy of 'classroom management' and 'student engagement', and the sub-scale 'planned persistence' of professional engagement, compared to teachers in the control group. Possible explanations of these findings are discussed, and suggestions for future TPD programmes and further research are proposed.

3.1 Introduction

Many educators, policy makers and researchers around the world are concerned about the development of novice teachers because of the praxis shock that means novice teachers often become aware of the gap between teaching practice and what they have learned in college. As shown in previous research, there is a high turnover rate in the first several years of novice teachers' career in various countries (Alliance for Excellent Education, 2004; CentERdata, 2013; O'Brien, Goddard, & Keeffe, 2008). In China, this situation seems to be even more serious in vocational education and training (VET) than in general secondary schools. In a study surveying 558 VET teachers, Chen and Xu (2011) found that 79.0% would like to teach in a general secondary school instead of VET schools, because working in a general secondary school usually yields a higher salary, better social reputation, better work environment and more opportunities for achieving success. There are also no strict requirements for teaching practicums in teacher education in China, and student teachers are allowed to gain practical experience by taking an internship in professions that are not directly relevant to teaching. This situation means that teachers in Chinese vocational secondary education are not always well prepared, and that additional teacher professional development (TPD) programmes are needed for most teachers to improve their competences and increase their retention.

In order to achieve these goals, various TPD programmes are being conducted in the Chinese VET system. Although these programmes are regarded as useful for the further development of novice teachers, the effects of these programmes are yet to be examined. Previous research on similar programmes in other countries provides some indications of possible effects (Ronfeldt & McQueen, 2017; Lyne, 2016; Mintz, 2019). For example, in a study on the effects of teacher induction in the United States, Ronfeldt and McQueen (2017) conducted a secondary analysis of a large sample of Schools and Staffing and Teacher Follow-Up Surveys (SASS/TFS) and the Beginning Teacher Longitudinal Survey (BTLS). The results show that receiving induction support in the first year led to less teacher migration and attrition in general. Effective support activities included mentoring, seminars for beginners and supportive communication with administrators or department chairs. The available studies are mostly about teachers in general education, however, using one-group only design or self-reported questionnaires. The current study focuses on a TPD programme that was carried out in a Chinese VET context, and the effects of

the TPD programme on the self-efficacy and professional engagement of novice teachers were examined using a pre- and post-test control group design.

3.2 Theoretical background

3.2.1 Novice teachers and teacher development in the Chinese VET context

Novice VET teachers in China may encounter challenges to accepting their identity as vocational school teachers, coping with non-motivated students, and managing the classroom, because the reputation and social acceptance of VET in China is lower than that of general education. A survey of 320 VET students and 230 parents of VET students showed that 52.0% of students and 44.8% of parents believe VET has a lower status compared to general secondary education (Gu, 2012). Students who attend vocational schools are usually those who have been rejected by general secondary schools, and they often have low academic performance and learning motivation. Research has shown that VET students in China have more behavioural problems in class than students in general schools, which means that VET teachers may have more difficulty motivating students for school, managing their classes, adapting their teaching to a proper level, and adjusting their expectations of their students (Ma et al., 2018; Ren, 2018). This context may also yield a lower teaching efficacy and higher turnover for Chinese VET teachers. Tong et al. (2008) examined 185 VET teachers and 153 general high-school teachers on their general teaching efficacy and personal teaching efficacy. The former involved teacher beliefs about the role of education in improving students in general, and the latter involved teacher beliefs in their own teaching ability. The results show that Chinese VET teachers had significantly lower efficacy in both dimensions, compared to teachers from general high schools. Bian and Zhang (2019) found that 51.1% of the 276 VET teachers included in their study reported an intention to leave the teaching profession, and they found that age, working pressure, working intensity, opportunity for promotion, the social status of VET, student numbers and student ability were significantly associated with VET teachers intending to leave the profession.

As a result, TPD programmes that aim to improve the teaching ability of novice teachers and their retention are commonly held in many Chinese VET schools. One of the most important school-based TPD programmes is the Teaching Research Group, which is widely conducted in almost all Chinese areas as a basic

school-based teacher learning activity in both vocational schools and general schools (Yang, Ran, & Zhang, 2020; Yang & Zhang, 2018). The Teaching Research Group works with peer communication meetings, where all teachers of the same school subject get together to discuss their teaching practice once a week or fortnight. Some government funded TPD programmes are also available for novice VET teachers in China. These government funded TPD programmes are usually comprehensive programmes consisting of a combination of different learning activities, which might be different in different areas. Typical activities in these programmes include lectures on vocational pedagogy, novice-expert interactions, teacher apprenticeships and teacher practices in companies, and some studies provide indications that such activities are effective in improving teaching expertise, professional engagement and vocational skills, (Jin et al., 2019; Shao & Zhou, 2013; Wang, 2016). For example, novice-expert interaction is commonly used in the TPD programme for Chinese vocational schoolteachers, which involves expert teachers providing feedback to novice teachers about their teaching performance. Research has suggested that this has positive effects on novice teachers' teaching concepts, competences, general strategies and emotional experience (Jin et al., 2019). Research has usually focused on examining one single activity in these programmes, however, and there are no studies in China investigating the effects of these comprehensive programmes as a whole.

In sum, the available research provides an overview of the special situation of novice teachers and their development in a Chinese VET context, which highlights the need to further examine the effects of local TPD programmes on the competence and retention of teachers.

3.2.2 Efficacy and professional engagement in teacher development

Teacher efficacy can be understood as a good indicator of teacher attitudes to teaching, and may predict their teaching competences and retention. Teachers with a high sense of self-efficacy generally show less professional burnout and higher job satisfaction, compared to teachers with lower teaching efficacy (Minghui et al., 2018; Oakes et al., 2013; Zhu et al., 2018). For example, Zhu et al. (2018) surveyed 1892 teachers from 74 schools across seven geographical regions of China to examine the relationship between a teacher's self-concept, efficacy and burnout. Structural equation modelling showed that teacher efficacy was a mediator between teacher self-concept and burnout. The burnout dimensions of emotional exhaustion, depersonalisation and reduced personal accomplishment were all affected by

self-concept via teacher efficacy. A teacher's sense of efficacy also predicted student achievement and their relationship with students. Studies have consistently found that high-efficacy teachers are more likely to promote students' learning motivation and academic performance, and they are usually better at coping with students' emotional and behavioural difficulties (Cantrell et al., 2013; Kim & Seo, 2018). In their study of student reading ability, Cantrell et al. (2013) investigated nine sixth-grade teachers, eleven ninth-grade teachers, and their students. They found that a teacher's efficacy was a significant predictor of students' reading comprehension and overall reading achievement.

Professional engagement is another crucial factor that can be used as an indicator of the effectiveness of TPD programme on teacher retention, and which is also closely related to a teacher's sense of efficacy. Research has found that a teacher's engagement and commitment to teaching is based on their sense of efficacy (Li et al., 2019; Minghui et al., 2018; Skaalvik & Skaalvik, 2014). For example, Minghui et al. (2018) surveyed 1027 special education school teachers in China and found that a teacher's self-efficacy was significantly correlated with both social support and professional engagement. Their engagement is also often associated with teaching motivation and professional satisfaction. In a study of the relationship between teacher engagement, job satisfaction and self-efficacy, Granziera and Perera (2019) collected data from 600 teachers in Australia and found that a teacher's engagement mediates efficacy and job satisfaction. Professional engagement can also predict a teacher's organisational behaviour and their intention to leave the profession. Somech and Bogler (2002) examined the relationship between a teacher's professional and organisational commitment and organisational citizenship behaviour (OCB). An analysis of 983 completed questionnaires from 25 middle schools and 27 high schools suggested that greater professional commitment may cause more OCBs when helping students. Teachers with greater organisational commitment were also more willing to help students, collaborate with colleagues and contribute to the school. In a study on the intentions of 249 health science teachers to leave the profession, Park and Johnson (2019) found that work engagement and job satisfaction were both negatively correlated with a teacher's intention to leave the profession.

In summary, teachers' sense of efficacy and professional engagement are significantly related to their job satisfaction, teacher retention, teaching quality and student achievement. A teacher's sense of efficacy and professional engagement can therefore be understood as important learning outcomes of TPD programmes. Most

of the TPD programmes conducted in China include several different local learning activities which have not yet been fully examined. This study set out to examine the effects of a TPD programme on the self-efficacy and professional engagement of novice VET teachers in a Chinese context. The programme examined in this study contains three different types of learning activities (lectures on pedagogy, lectures on professional ethics and mentoring teaching practice) that aim to improve the teaching expertise and retention of novice VET teachers. The research questions are:

- What is the effect of the TPD programme on novice teachers' sense of efficacy?
- What is the effect of the TPD programme on novice teachers' professional engagement?

3.3 Method

3.3.1 Setting

Data was collected from the Standard Training Programme for Novice Vocational School Teachers in Shanghai (China), which is an annual programme organised by the Shanghai Municipal Education Committee and the Institute of Vocational and Technical Education of Tongji University (Shanghai, China). The programme lasted some nine months, from October 2017 to July 2018. Novice teachers attended the programme activities on a Wednesday almost every week, and it took 30 weeks and 240 hours to complete all courses. In 2018, when we collected the data, and 144 novice teachers participated in the programme on a voluntary basis.

The main goals of this programme are increasing teacher retention in vocational schools and supporting the development of teaching expertise in novice teachers. In order to achieve these goals, three training modules are conducted, each taking ten weeks to complete: 1) theories of VET teaching, which is a series of lectures on the current situation and development of VET, pedagogy in VET, and educational psychology in VET; 2) a teacher's professional ethics, which also includes lectures, but on the topic of classroom management, theories of moral education, and student-teacher interaction; and 3) teaching practice, which is a special training part that is carried out in the form of novice-expert interaction. The latter typically contains activities such as expert feedback on teaching videos of novice teachers, observing expert teachers teaching, and joint lesson design. The expert teachers, who are paid by the local government for their participation, are responsible for providing lectures, feedback, and practice instruction to novice teachers.

3.3.2 Respondents and data collection

A pre-test and post-test control group design was used in this study to examine changes in novice teachers after participating in the programme. All the respondents had less than three years of teaching experience and were participating in the same school-based teacher learning activity, called the Teaching Research Group, where teachers hold communication and discussion with peers in the same teaching subjects every week or fortnight. Novice teachers in the experimental group participated not only in this basic school-based activity, but also attended the additional programme with lectures on the pedagogy of vocational education, mentoring from external expert teachers and training on professional ethics.

Data was collected from 83 novice teachers from seven VET schools in Shanghai. Invitation e-mails were sent to all 144 participants of the TPD programme as the experimental group. The questionnaire was only sent to the 41 novice teachers who agreed to complete both the pre-test and post-test. Data for the control group was collected using snowball sampling by asking teachers from the TPD programme to invite novice VET teachers who hadn't participated in that programme. For the control group, 42 novice teachers completed both pre-test and post-test. The questionnaire was anonymous and all participants were informed that the data would be only used for research purposes. Table 3.1 provides an overview of the demographic characteristics of the 83 participants of this study. Research clearance was obtained from the Ethical Committee of the ICLON Graduate School of Teaching, Leiden University, file number: ICLON-IREC 2019-09.

Table 3.1 Demographic information for the respondents

Demographic variables		Experimental group		Control group	
		Frequency	Percentage	Frequency	Percentage
Gender	Female	25	60.98%	28	66.67%
	Male	16	39.02%	14	33.33%
Teaching experience	< 1 year	24	58.54%	25	59.52%
	1-2 years	15	36.59%	14	33.33%
	2-3 years	2	4.88%	3	7.14%
	> 3 years	0	0%	0	0%
Teaching subject	General course	18	43.90%	15	35.71%
	Vocational course	23	56.10%	27	64.29%
Educational background	Secondary vocational education	0	0%	0	0%
	Higher vocational education	1	2.44%	3	7.14%
	Bachelor's degree	24	58.54%	26	61.90%
	Master's degree	15	36.59%	13	30.95%
	Doctorate	1	2.44%	0	0%

3.3.3 Instruments

The questionnaire used in this study was presented in Appendix A, and it contained two scales that separately aimed at measuring teaching efficacy and professional engagement. Teaching efficacy was measured using the longer form of the Teachers' Sense of Efficacy Scale (TSES; Tschannen-Moran & Hoy, 2001). The TSES is one of the most widely used measures of teacher efficacy, and has already been validated in many Asian countries (Chong et al., 2010; Ruan et al., 2015; Scherer et al., 2016). The authors adapted and translated the questionnaire into Chinese. The original TSES is a nine-point Likert scale including three factors: 1) student engagement, which refers to a teacher's sense of ability to motivate their students (e.g., "How much can you do to foster student creativity?"); 2) instructional strategies, which refers to a teacher's confidence in their ability to conduct the

course (e.g., “To what extent can you craft good questions for your students?”); and 3) classroom management, which means a teacher’s efficacy in handling the classroom (e.g., “How much can you do to get children to follow classroom rules?”). Each of the three factors contains eight items. One item, “How much can you assist families in helping their children do well in school?” was deleted in the adapted version, as it is not a common duty of teachers in Chinese vocational schools to collaborate with a student’s family. The current version used a seven-point Likert scale ranging from 1 (not at all) to 7 (always), in order to make it easier for novice teachers to make a choice. A translation-back-translation procedure was applied to guarantee that the original meaning of the items was followed. Exploratory factor analysis with varimax rotation shows that all the items were clearly grouped into the original three factors, except two items that show cross-loading (factor loadings >0.45 on more than one factor). After deleting the cross-loaded items, the explained variance was 69.66% and the Cronbach’s alphas for each scale were 0.92 for instructional strategies, 0.94 for classroom management, and 0.92 for student engagement.

We used the ‘planned effort’ and ‘planned persistence’ sub-scales from the Professional Engagement and Career Development Aspirations scale (PECDA; Watt & Richardson, 2008) to measure the professional engagement of novice teachers. ‘Planned effort’ indicates how much effort teachers are willing to spend on their work, with an example item “how much will you work at being a good teacher?”. ‘Planned persistence’ refers to a teacher’s will to remain in teaching, which contains items like “How certain are you that you will remain in teaching?” The five-point Likert-type scale of the original version was adapted into a seven-point Likert scale, with 1= not at all and 7= always. A translation-back-translation procedure was used to guarantee that the original meaning of the items was regained. Exploratory factor analysis with varimax rotation shows that all items are grouped in the two original factors, explaining 81.09% of the total variance. The reliability of the ‘planned effort’ and ‘planned persistence’ sub-scales in terms of Cronbach’s alpha are 0.90 and 0.94, respectively.

3.3.4 Analysis

In order to examine the effects of the programme on novice VET teachers’ sense of efficacy, a multivariate analysis of covariance was conducted (SPSS25) with the condition (experimental or control) as factor, the post-test scores on all three sub-scales in teacher efficacy as dependent variables, and their pre-test scores as

covariates. Paired sample t-tests were conducted on the changes in self-efficacy within the experimental group. Similar analyses were performed to answer the second research question on a teacher's professional engagement.

3.4 Results

3.4.1 Teachers' sense of efficacy

Table 3.2 summarises the descriptive statistics for self-efficacy. The multivariate analysis of covariance shows a significant effect of condition on the post-test score of a teacher's self-efficacy (Wilk's λ (3, 82) = 0.711, $p < .001$, $\eta 2 = 0.289$) with significant differences for the dimension of student engagement (F (1, 82) = 15.70, $p < .001$, $\eta 2 = 0.168$) and classroom management (F (1, 82) = 14.01, $p < .001$, $\eta 2 = 0.152$). No significant difference was found between the experimental and control conditions for the dimension of instructional strategies (F(1, 82)=1.46, p=.23, $\eta 2=0.018$). These results show that the TPD programme conducted in the current study had a significant effect on a teacher's self-efficacy with regard to student engagement and classroom management. Paired-samples t-tests show that teachers in the experimental group scored significantly higher on the post-test than on the pre-test for 'student engagement' (t (40) = -7.99, $p < .001$, d = 0.58), 'instructional strategies' (t (40)= -4.28, $p < .001$, d = 0.47), and 'classroom management' (t (40)= -7.54, $p < .001$, d = 0.66). This indicates that all three dimensions of a teacher's sense of efficacy are increased during the nine months, although the current programme only changes efficacy on student engagement and classroom management.

Table 3.2 Descriptive statistics of self-efficacy scale

		Experimental (*n*=41)		**Control (*n*=42)**	
		M	**SD**	**M**	**SD**
Student engagement	pre-test	4.76	0.75	4.77	0.53
	post-test	5.17	0.66	4.89	0.58
Instructional strategies	pre-test	4.84	0.65	4.70	0.70
	post-test	5.14	0.64	5.15	0.58
Classroom management	pre-test	4.79	0.75	4.71	0.82
	post-test	5.24	0.60	4.93	0.64

3.4.2 Teachers' professional engagement

Table 3.3 presents the descriptive statistics for professional engagement. The results from the multivariate analysis of covariance show that the conditions have a positive effect on the post-test score for professional engagement (Wilk's λ (2, 82) = 0.914, $p < .001$, $\eta 2 = 0.086$) with a significant difference on the sub-scale of planned persistence (F (1,82) = 7.25, p = .009, $\eta 2 = 0.084$). No significant difference was found between the experimental and control conditions for planned effort (F (1,82) = 0.51, p = .476, $\eta 2 = 0.006$). The findings suggest that the programme has a significant effect on the a teacher's planned persistence, rather than planned effort. The results of the paired sample t-test for a teacher's professional engagement show a similar effect. Teachers in the experimental group show a significantly higher score in the post-test for 'planned persistence' compared to the pre-test (t (40) = -4.54, $p < .001$, d = 0.48), however, no difference was found between pre-test and post-test on 'planned effort' (t (40) = -1.95, p = .058). This indicates that a novice teacher's persistence increases during their participation in the programme, but their planned effort remains unchanged.

Table 3.3 Descriptive statistics of professional engagement scale

		Experimental (*n*=41)		**Control (*n*=42)**	
		M	**SD**	**M**	**SD**
Planned effort	pre-test	5.65	0.95	5.44	0.76
	post-test	5.79	0.72	5.58	0.62
Planned persistence	pre-test	5.84	0.89	5.59	1.23
	post-test	6.21	0.61	5.86	0.78

3.5 Discussion and Conclusion

This study examined the effects of a comprehensive TPD programme on the efficacy and professional engagement of novice VET teachers. Effects were found for two efficacy scales, 'student engagement' and 'classroom management', and for one professional engagement scale, 'planned persistence'. No effects were found with respect to self-efficacy in 'instructional strategies' or to professional engagement in 'planned effort'.

3.5.1 Effects on teachers' sense of efficacy

With respect to self-efficacy, the programme examined in this study demonstrated effects on particular sub-scales of teaching concerning interaction between and with students in class. The effect on efficacy in instructional strategies was non-significant. This different result can be understood from the perspective of Fuller's seminal work on a teacher's concerns. According to Fuller (1969), novice teachers are mainly concerned about self-protection and self-adequacy in their early phase of teaching career. The specific issues they need to deal with during this stage are 'class control, subject matter adequacy and finding a place in the power structure of the school and understanding expectations of supervisors, principal and parents' (Fuller, 1969, p. 211). This focus of a novice teacher's concerns may explain their significant increase of efficacy in classroom management and student engagement, and the absence of an effect on efficacy in instructional strategies, as the latter merely indicates an emphasis on student learning. The context of Chinese VET may also need to be taken into account for understanding a teacher's specific concerns during their participation in the TPD programme. As introduced in the second section, VET teachers in China encounter more problems in motivating students, managing classrooms, adapting their teaching to the proper level, adjusting their expectations and understanding their students than teachers from general secondary schools (Ma et al., 2018; Ren, 2018). This probably leads novice teachers to consciously pay more attention to improving their ability to engage students and manage their classroom during the programme, instead of instructional strategies (although instructional strategies are also an important goal of this TPD programme, as described in the setting section). We thus reasonably argue that it is not only how the programme is organised or the parts in the programme, but also the context and a teacher's learning needs that influence the effects of TPD programme.

The non-significant effect on a teacher's efficacy on instructional strategies can be explained by the combination of different learning activities in the TPD programme. According to previous research, lectures and consultation with expert teachers, which are the main activities in the current programme, may be not the only or best ways of improving a novice teacher's self-efficacy. A qualitative case study with nine junior pre-service teachers conducted by Yurekli et al. (2020) found that a combination of six learning activities in a teacher education programme (lecture hours, group work, peer presentations, feedback on group work, assigned readings and examination) affected a pre-service teacher's self-efficacy with

different resources. In the current programme setting, the lack of group work and examinations might explain why the programme of this study was not found to affect a novice teacher's efficacy in instruction.

3.5.2 Effects on teachers' professional engagement

This study found a significant effect on the professional engagement of teachers only in the dimension of 'planned persistence', which means after the programme, novice teachers are more sure about staying in the teaching profession. This could be related to the aim of the programme, which is to improve the retention and teaching ability of novice teachers. It might be that the expert mentoring of a novice teacher's practice was mainly responsible for this effect. Similar learning activities, such as 'peer review of teaching', 'mentoring' and 'teacher learning communities' have been found useful in keeping novice teachers engaged with the profession (Parker, Ndoye, & Imig, 2009; Ronfeldt & McQueen, 2017; Whalen, Majocha, & Van Nuland, 2019). In a study with a large sample of 8838 novice teachers who were mentored by more experienced teachers during their first two years of teaching, Parker et al. (2009) found that mentoring programmes in which participants (mentor and mentee) were matched by grade level and met at least once a month were effective in improving the commitment of novice teachers to the profession.

The effort teachers are willing to put into teaching might be related to other factors. In their research on teacher motivation for the profession, Fokkens-Bruinsma and Canrinus (2012) found that a teacher's perception of working conditions, task difficulties and career value are important predictors of their teaching efforts. Similar results have also been found by Fresko, Kfir, and Nasser (1997). They collected data from 175 teachers and found that job satisfaction was the only variable that was directly related to their professional commitment, while other factors, such as professional self-image, teaching abilities, gender, and pupil grade level were indirectly related. These results indicate that many factors are relevant with teachers' work effort, and that job satisfaction seems to be the most important one. However, the working conditions in Chinese VET schools may decrease a teacher's job satisfactions. In research it has been reported that teachers in Chinese vocational schools usually have a lower salary, poorer social status, fewer promotion opportunities and higher workload than those in a general secondary school, and this can cause an increase of VET teachers' turnover intentions and negative attitudes towards their career (Bian & Zhang, 2019; Chen & Xu, 2011). Thus, it might be that TPD programmes are not very effective in

improving a teacher's planned effort unless the weak position of VET in China is to change.

3.5.3 Limitations

Since the TPD programme conducted in our research is a comprehensive programme which contains different kinds of learning content (such as vocational education pedagogy, teacher ethic and teaching practice) and learning activities (lectures, mentoring and lesson observation), it is hard to attribute the change in a teacher's efficacy and professional engagement to specific aspects of the programme. Future research might examine the effectiveness of these separate aspects by, for example, comparing various programme alternatives.

3.5.4 Practical implications

One practical implication of this study is that the change in a teacher's efficacy means that the context and a novice teacher's concerns may influence the effect of a TPD programme. Teachers may consciously choose the learning content and activities they need most and neglect the content they don't need. We thus suggest that future TPD programme be more targeted to a novice teacher's learning needs, so as to help novice teachers to improve the skills they need the most to meet the challenges of their teaching context. We also suggest further research on a teacher's learning preferences and their relationship with a differential effect of TPD programmes. The specific learning activities conducted in TPD programmes seem to be relevant to particular aspects of a teacher's sense of efficacy. For example, the lack of group work in the programme in the current study may have prevented novice teachers from acquiring enough mastery, experience and affective state, and observing peers teaching may have provided novice teachers with vicarious experience (Yurekli et al., 2020). The mastery experience, affective state and vicarious experience are important elements that construct a teacher's self-efficacy. We therefore suggest that future TPD programmes include more activities and adaptively match these activities to the needs of the teachers in order to support a teacher's development of different aspects of self-efficacy.

Secondly, the change in a teacher's professional engagement suggests that the current programme may contribute more to increasing a teacher's willingness to stay in the teaching profession than to improving their work effort. According to previous studies, working conditions, job satisfaction, task difficulty and a teacher's perception of career value are some of the predictors of work effort, and job

satisfaction seems to be the most crucial of these (Fresko, Kfir, & Nasser, 1997). These findings imply that future teacher induction programmes might need to focus on developing not only a novice teacher's pedagogy, but also their perception of the value of a teaching career. With regard to working conditions and job satisfaction, we suggest policy makers and school leaders in a special teaching context (such as vocational education, special education and early childhood education) should consider improving the work environment of teachers, raising their salaries and hiring more staff.

3.5.5 Concluding remarks

After analysing the questionnaires using a pre- and post-test control group design, we concluded that the comprehensive TPD programme in the context of Chinese vocational education has been effective in improving the willingness of novice teachers to remain in the profession, and their self-efficacy in classroom management and student engagement. However, the programme in its current form does not seem to be effective in improving novice teachers' efficacy in instruction and the effort they put into their work. One possible reason for the non-significant effects may be relevance of the programme in the light of the different concerns and learning needs of teachers.

Chapter 4

Learning from Novice–expert Interaction in Teacher Professional Development

This chapter was published in an adapted form as:

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Abstract

Novice–expert interaction plays an important role in teacher professional development (TPD) for Chinese vocational education and training (VET). Both Chinese and international research shows that expert-teachers' support is associated with the improvement of novice-teachers' teaching. However, insights into how exactly novice teachers learn with the help of expert teachers are lacking. The learning processes of four novice VET teachers were explored in the context of a TPD project. Data were collected by semi-structured interviews with novice teachers and recordings of novice–expert interactions. A learning model was constructed based on the interconnected model of professional growth. The results showed that novice teachers internalised comments from expert teachers by active reflection and practice. Moreover, this study suggests that teacher learning through novice-expert interaction is a complicated long-term process, and that during their development the support from expert teachers is an important external source for novice-teachers. Expert-teachers' support not only provides feedback and suggestions for alternative teaching methods, but also encourages and maintains novice-teachers' learning. The results are discussed in relation to the Chinese cultural and VET context.

4.1 Introduction

In teacher professional development (TPD), the induction period is regarded as a crucial time that will greatly affect teacher retention. As shown by previous research, there is a high turnover rate in the first years of novice teachers (O'Brien et al., 2008; CentERdata, 2013; Alliance for Excellent Education, 2004). This situation might be caused by the gap between teacher education and teaching practice, also known as praxis shock (Veenman, 1984; Cole & Knowles, 1993; Stokking et al., 2003).

Similar to Western countries, in the context of Chinese vocational education and training (VET), the praxis shock of novice teachers may be more severe because of some special challenges caused by social and culture factors. From a cultural perspective, the reputation and social acceptance of vocational education is relatively low, because students and parents believe that vocational education is for lower social classes (Li & Xu, 2018). A survey on 320 VET students and 230 parents of VET students showed that 52.0% of students and 44.8% of parents believe VET has a lower status compared to regular secondary education (Gu, 2012). Besides, the Chinese VET system has been relatively separated from general education for a long time (Zhao, 2018). For students in Chinese vocational schools it is usually difficult to transfer to general secondary schools and they have a low chances to enrol in college. In this context, novice VET teachers may experience problems in motivating students, managing classrooms, adapting their teaching to a proper level, adjusting their expectation and understanding the background of their students (Ren, 2018; Ma et al., 2018).

In contrast, expert teachers are usually considered more proficient in teaching expertise. Borko and Livingston (1989) found that novice mathematics teachers showed more time-consuming planning, encountered problems when attempts to be responsive to students led them away from scripted lesson plans and reported more varied, less selective post-lesson reflections than experts. Meyer (2004) found that novice teachers hold insufficient conceptions of their students' prior knowledge, which expert teachers make better use of when giving instruction. A similar result was also found in Chinese vocational education. Expert VET teachers appear to have more well-structured knowledge, more automated general pedagogical skills and stronger beliefs in their career than novice teachers (Zhao, 2010). Therefore, TPD projects with novice–expert interaction are widely used to promote novice VET teachers' learning in China, such as expert teacher workshops (Yang, 2013) and teacher apprenticeships (Shao & Zhou, 2013). Moreover, in Chinese culture

relatively more respect is shown for older people, and people believe senior colleagues are more skillful and proficient. This is also an important context of those novice-expert-interaction-based programmes.

The effect of these TPD programmes might be supported by some literature on the topic of teacher mentoring. For instance, Carter and Francis (2001) found that collaborative, reflective novice–expert relationships in the workplace were tightly associated with novice-teachers' positive experiences and TPD. Moreover, novice–expert interaction in mentoring is also an important factor affecting novice-teachers' retention and professional identity (Ingersoll & Kralik, 2004; Smith & Ingersoll, 2004; Shields & Murray, 2017). However, little research has focused on how novice teachers actually learn from experts in TPD programmes. This knowledge is important for optimizing novice-teachers' professional development programmes.

To enrich previous research and contribute to future TPD programmes, this study aims to provide an in-depth look into the learning process during novice–expert interactions.

4.2 Novice-teachers' learning

Novice-teachers' learning can be framed in the literature on the problems novice teachers meet, their interactions with expert teachers as a support of their learning and a more general model for teachers' professional growth.

4.2.1 Novice-teachers' problems in the context of Chinese vocational education

In many countries, research on teacher turnover has found a universally high attrition rate among novice teachers. Every year, 207,000 novice teachers (around 6%) do not return to teaching in their second year in the US (Alliance for Excellent Education 2004). In an Australian study, 29% of teachers were thinking about leaving teaching, and 10% indicated they had already made the decision to leave by the second year of teaching (O'Brien et al., 2008). Similarly, 66.7% of Chinese secondary school teachers are not satisfied with their jobs, and there is a significant negative correlation between their job satisfaction and turnover intention ($r = -0.67$, $p < 0.001$). More detailed statistics in this study showed that teachers younger than 46 years old have a significant higher turnover intention ($F = 9.782$, $p = 0.000$) when compared with their senior peers (Liu et al., 2010).

This serious turnover situation may be closely related to problems that novice teachers meet in their workplace, such as deficiency of administrative support, poor school climate, behavioural problems of students, absence of peer support networks, job dissatisfaction, a potential better career in a different work domain and not being able to use effective teaching strategies and so on (Ingersoll, 2001; Stockard & Lehman, 2004; Andrews et al., 2007; Alliance for Excellent Education, 2004; Ingersoll & Smith, 2003). The problems of novice teachers may even be more severe in VET schools.

In a study by Chen and Xu (2011), VET teachers were asked if they would like to teach in a general secondary school instead of VET schools if they were given the opportunity; 79.0% of them (n = 558) reported positively and stated that the higher salary, better social reputation, better work environment and opportunities to achieve self-worth in the general secondary schools were important reasons for this. The absence of these factors may also result in teacher burnout. A survey of 294 Chinese VET teachers showed that 33.2% of them reported extreme job burnout, 51.1% strong job burnout and only 15.7% almost no job burnout (Zhang & Ding, 2011). A detailed analysis in this study showed that the main factor causing the burnout of novice teachers is emotional exhaustion, which may be caused by students' misbehaviour and novice-teachers' lack of classroom management skills. The findings implicated that the problems VET teachers encountered may result from the low status VET has in Chinese schooling system, in addition to a lack of particular teaching skills. Thus, how novice teachers can cope with the unique VET environment may be another important issue besides their learning to teach. To support the development of novice VET teachers in China, many novice–expert interaction-based TPD projects are carried out, and many studies provide empirical evidence of the positive effect of these projects.

4.2.2 Novice–expert interaction as a support of teacher learning

In a report for the Education Commission of the United States, Ingersoll and Kralik (2004) located 150 empirical studies of induction and mentoring programmes, and reviewed 10 studies in detail. The report concluded that mentoring programmes have a positive impact on new teachers and their retention. Another study showed that novice teachers who were supported by mentors are less likely to move to other schools and less likely to leave the teaching occupation after their first year of teaching (Smith & Ingersoll, 2004). In addition, research also showed that mentoring can affect novice-teachers' professional identity. For instance, a case study based on

semi-structured interviews with preservice teachers and their mentors showed high levels of confidence and development of teacher voice by the end of their practicum, which indicated that a positive mentoring relationship is related to the change of preservice teachers' identity (Izadinia, 2016b). Shields and Murray (2017) also found that the legitimacy of novice teachers recognised by mentors positively influences the development of beginning teachers' professional identities. Besides mentoring, other novice–expert interaction-based activities in China also proved to be useful in developing novice-teachers' professional expertise by means of activating reflection on their teaching by, for example, lesson evaluation and lesson observation (Li, 2009; Cui, 2012).

Since the support of expert teachers is widely believed to be productive in promoting novice-teachers' learning, a detailed inquiry on how novice teachers learn from expert teachers is relevant and necessary. Previous research provided some insights into novice-teachers' learning in the context of novice–expert interaction. For instance, challenging traditional hierarchical relationships, involving a commitment to collaborative, inquiry-oriented approaches towards mentoring, risk-taking within the classroom, the mentor teachers' use of constructive feedback and 'mentoring-down-the-hall' are all considered as important learning approaches in mentoring (Attard-Tonna et al., 2017; Bentley et al., 2017). However, these learning approaches cannot fully answer the question of how novice teachers learn with the help from expert teachers. To answer this 'how' question, an integrated model of teacher learning is needed to explicate the change of novice-teachers' cognition and behaviours, instead of discussing learning approaches, activities and effects separately.

4.2.3 The interconnected model of professional growth

A frequently cited model of teacher learning is the interconnected model of professional growth (IMPG). Clarke and Hollingsworth (2002) built this model based on Guskey's model of the process of teacher change (Guskey, 1986) and stated that teacher learning occurs in a mediating process of 'reflection' and 'enactment' through four distinct and also interrelated domains: 1) the personal domain (teacher knowledge, beliefs and attitudes); 2) the domain of practice (professional experimentation); 3) the domain of consequence (salient outcomes); and 4) the external domain (sources of information, stimulus or support). Change in any domain will result in changes in other domains, as shown in Figure 4.1.

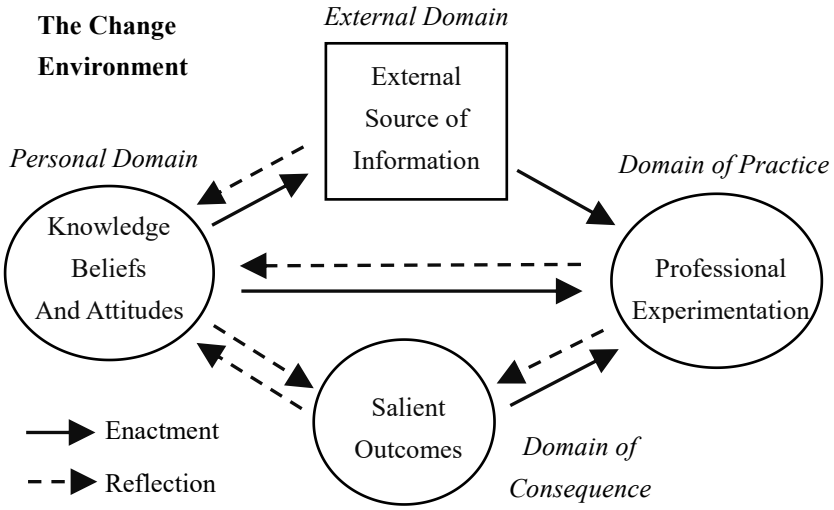

Figure 4.1. The interconnected model of professional growth
From Clarke and Hollingsworth (2002). p. 951

In this model, 'enactment' refers to implementing a new idea or a new belief instead of simply acting. The 'reflection' is derived from Dewey (1910), which means 'active, persistent and careful consideration'. By analysing these two mediation approaches within domains, teacher learning processes in different contexts can be explained (Witterholt et al., 2012; Justi & van Driel, 2006). Furthermore, some more specific patterns of teacher learning were revealed by adapting the IMPG in the context of reciprocal peer coaching (Zwart et al., 2007). Zwart et al. (2007) included reciprocal peer coaching as a main part of the external domain, and also added teaching practice and teaching preparation in the domain of practice. The IMPG can also be used in this study for a better understanding of how the external domain (learning source from expert teachers) interacts with novice-teachers' individual professional domains (personal domain, domain of practice and domain of consequence). However, the IMPG model mainly focuses on the change between domains, which hinders a more detailed elaboration of changes within a specific domain. Therefore, in this study, changes in novice-teachers' teaching beliefs and behaviour within the personal domain and domain of practice are investigated in more detail.

Thus, the aim was to develop an integrated and specific model of teacher learning in a novice–expert interaction-based TPD project in the context of Chinese

vocational education. According to this goal, our research question is formulated as:

- How can novice-teachers' learning in novice–expert interaction be characterised in the context of Chinese vocational education?

4.3 Method

4.3.1 Context of the TPD project

This research was carried out within the Standard Training Programme for Novice Vocational School Teachers in Shanghai (China). This is an annual programme developed and organised by the Shanghai Municipal Education Committee and the Institute of Vocational Education and Training of Tongji University (Shanghai, China). The programme is aimed at promoting the development of novice VET teachers. The novice teachers who participated all submitted an application. The expert teachers are paid by local government to participate, and they play the role as an outsider providing expert feedback and comments, instead of a daily mentor in novice teachers' school. All the expert teachers are certificated by the Shanghai Municipal Education Committee, for which they have to have at least 10 years of teaching experience and be examined by both their schools and local education committee. There were 62 novice teachers and 32 expert teachers participating in the year 2015 when we collected the data. All the novice and expert teachers were divided into 10 groups according to the subjects they were teaching, and every group usually consisted of six novice teachers and three expert teachers.

Within the training programme, the novice and expert teachers would have three sessions (about once a month) to discuss their teaching with expert teachers, usually at the school of the novice teacher. Every novice teacher was required to present different forms of lesson presentations of his/her own teaching in every session (e.g. teaching video, lesson plan and classroom teaching). A group of expert teachers then give feedback and have a conversation with every single novice teacher after their presentations. An informal assessment form is used by the experts to make notes when listening to novice teachers, which consists of seven categories: 1) language and manner; 2) teaching goals; 3) teaching content; 4) teaching method; 5) using of technology and media; 6) achieved goals; and 7) teaching features. However, this form is not sent to novice teachers and is just for expert teachers to make notes, and expert teachers share their opinions with novice teachers orally.

4.3.2 Participants of the study

Based on previous observations of the participated novice teachers in the Standard Training Programme for Novice Vocational School Teachers in Shanghai (China), six novice teachers who are active participants of the programme were invited to participate in this study. Four of them accepted to be interviewed after completing the programme (see Table 4.1). Participants' names were anonymised and replaced with aliases.

Table 4.1 Information on participants

Name	Gender	Years of teaching experience	Subject
Wendy	Female	1	Chinese language
Emma	Female	1	Chinese language
Tina	Female	1	Moral education
Sarah	Female	3	Moral education

Note: The moral education usually combines four modules: 1) career planning; 2) professional ethics and law; 3) politics and societies; and 4) philosophy and life.

4.3.3 Data collection

To explore the specific learning of novice teachers in the novice–expert interaction, two kinds of data were collected: 1) audio recordings of three novice–expert interactions from each novice teacher (12 recordings in total); and 2) an interview with each novice teacher.

First, before the interaction session, a lesson of each novice teacher was videotaped. During the first session, experts watched and discussed the video together with the novice teacher who presented her teaching video, which took about one hour for every novice teacher. Second, after around four weeks, the second session was organised, in which novice teachers gave a short presentation of their teaching plans for around 15 minutes, then the expert teachers and novice teachers discussed the plan for about 40 minutes. Third, the last part of the project concerns classroom teaching. The expert teachers went to the school of every novice teacher and sat at the back of the classroom to observe novices' teaching. After the class, they had a conversation with the novice teacher for about one hour.

After the novice teachers finished all three sessions, they were interviewed by the first author. In all cases: 1) the interview took place in an empty classroom or office with the participant and the interviewer only present; 2) the interviews lasted between 50–70 minutes; 3) the interviews were audio recorded with the novice teacher's permission; and 4) the transcript of the audio tape was sent to the interviewees (novice teachers) for member checking.

4.3.4 Interview procedure

According to Minichiello, Aroni and Hays (2008), the interview outline of a qualitative research should be open-ended to get as much information as possible from the interview. To gain a specific understanding of novice-teachers' learning, our interview started with a general question "please recall the most impressive lesson you learned in the project and describe how you learned it" (see Appendix B for the interview outline). Novice teachers were asked to answer the question by telling a story which should include at least: 1) what comments they got from expert teachers; 2) how they thought about the comments at that moment; 3) whether they decided to change; and 4) whether these changes were kept in their daily teaching. If the interviewee did not give a detailed account, we asked follow-up questions such as "Since you said you accept their advice, then what do you do in your daily teaching in the same situation?" After having gathered the necessary information, a new round of questions would start with the question "Is there another impressive things you learned in the conversation with experts beside what we just talked about?" This procedure was repeated, and in general, two or three storylines were collected for every one hour interview.

To ensure reliability and protect the privacy of respondents, some criteria were set and also used as guidelines for collecting the data: 1) asking permission before interview and recording, and respondents have the right to stop the recording if necessary. It happened once when we were interviewing Tina, she asked to stop for several minutes when she complained about the negative attitude of her school principal towards teachers' participation in TPD projects; 2) ensuring that respondents fully understand the purpose of the research, and emphasise that the recording of interviews is only for research purposes; 3) interviewed teachers are anonymous throughout the whole research, and their names are replaced with English ones; 4) the transcripts of the interviews and the results of this research was sent to the respondents, asking for their comments and feedback to avoid misunderstanding of their interview.

4.3.5 Data analysis

After data collection, all 16 audio recordings (one interview and three novice–expert interaction sessions for each novice teacher) from four novice teachers were transcribed into text, and then it was sent to participants for member checking. The transcribed text of all 16 recordings included 81,520 Chinese characters in total. After the transcription, two independent researchers read these texts and marked segments closely related to the research questions (i.e. sentences which may indicate what and how novice teachers learn). Data analysis was mainly based on grounded theory (Glaser et al., 1967; Strauss & Corbin, 1990). However, some sensitizing concepts (e.g. teacher change, sense making, teacher knowledge and reflective teaching) were present prior to data collection. These were chosen based on the authors' previous observation of similar TPD programmes and knowledge of learning theories. These sensitizing concepts are constantly adjusted and refined throughout the analysis.

Three coding steps were involved in the analysis. The first step was open coding. The researchers read through the transcription and then labelled the text into 217 units referring to the different meanings. A unit consisted of a few sentences, a short paragraph or a phrase on one single topic. All the units were named by words or short sentences based on summarising the text. Later, these units were generalised into 51 primary concepts.

The second step was axial coding, comparing the meaning of all 51 primary concepts of teacher learning, and then generating them into 15 main concepts grouped into four categories. Table 4.2 shows the final categories and concepts with a short description in the right column. The transcribed data and coding table were sent to three Chinese associate professors in educational science, and were discussed and revised three times until all agreed. Since the analysis was primarily data driven, most concepts in the table came from the data. Exceptions were the concepts under the category 'Comments/advice from expert-teachers', which were named after the teacher knowledge framework (Grossman, 1990), because the four kinds of knowledge fitted the data. To match the actual process of teacher learning, our data coding may refer to different levels of abstraction.

Table 4.2 Data encoding and definition of concepts

Categories	Concepts	Definitions
Comments/ advice from expert teachers	General pedagogical knowledge	Knowledge of broad principles, strategies, teaching and learning theories that are not subject-specific.
	Knowledge of context	Understanding of the communities, regions, schools, classrooms and students in the country they live.
	Subject matter knowledge	Knowledge of the professional subject a teacher teaches, which contains syntactic structures, substantive structures and content.
	Pedagogical content knowledge	Knowledge of how to teach specific content in specific contexts, which includes: conceptions of purpose for teaching subject matter; knowledge of students' understanding; curricular knowledge; and knowledge of instructional strategies.
Sense making	Acceptance	Novice teachers accepted advice of expert teachers without doubt, which will directly lead to the 'trail'.
	Cognitive differences	Novice teachers have different points of view or different teaching methods to experts.
	Reflection	An effort to reconcile the expert comments and their original cognition or behaviour.
Adapting practice	Neglect	The novice teachers reject the advices from expert teachers for some reason.
	Re-assumption	Repeated construction of better teaching based on the analysis of expert-teachers' comments and novice-teachers' own situations.
	Trial	Experimenting with the new assumption proposed by novice teachers or advice provided by expert teachers.
	Feedback	The result of the trial.

Table 4.2 (Continued)

Categories	Concepts	Definitions
Learning outcome	Teaching concepts	Novice-teachers' new ideas and understanding of themselves as a teachers, their students and teaching.
	Teaching competences	Basic principles of how the novice teachers should perform in the class, including teaching manners, wording and interaction with students.
	General strategies	Strategies that can be widely used in many different situations without a deep analysis of the characters of students and teaching contexts.
	Emotional experience	The change of novice-teachers' feelings about themselves, students and teaching, which may promote their intention of continuous learning.

Third, the last step was selective coding where the researcher integrated these concepts and categories into one system based on consequences of events as described by Strauss and Corbin (1990). This meant that concepts were ordered according to the storyline of novice teachers. To illustrate the coding process and the outcomes of this process, an example is included in Table 4.3. The fragment relates to an answer to our interview question 'Please recall the most impressive lesson you learned in the project and describe how you learned it' from Tina. Tina teaches on the moral education course in her first year. She was very positive and received quite some help from the expert teachers.

As shown in Table 4.3, eight codes were used in the open coding phase and were grouped into six concepts and four categories in the axial coding phase. After all the concepts and categories were defined, they were ordered by their consequences and function in the processes. In this example, teacher Tina's storyline gives a clear clue of the comment she received from the expert teachers (a1), how she thought about the comments (a2, a3), what she actually did (a4, a5) and what happened after she performed some changes (a6, a7, a8). Therefore, a connection was built as 'comments of expert teachers (a1) to cognitive differences (a2) to reflection (a3) to trial (a4 and a5) to feedback (a6 and a7) to learning outcome (a8)'. However, this connection only showed the specific learning process of Tina in her specific situation; a more general learning model will follow in the results section.

Table 4.3 An example of the coding process

Categories	**Concepts**	**Sub-concepts**	**The statement of a novice teacher**
Comments/ advice from expert teachers	General pedagogical knowledge	Lack of pedagogical knowledge (a1)	Tina: "As many experts mentioned a lot, a common phenomenon in moral education is sermon (a1). That means the lesson is not connected to students' life, but it's like preaching a sermon. However, it's just my ability and habit (a2) … how to draw my lessons into practice is still hard for me. I am thinking about this problem and keep trying (a3) since the first session … For example … To relate your lesson to students, you have to know your students better, the background, and their lifestyle and…hmm…just weigh them up (a4). As a head teacher of a class, I have the opportunities to observe my students … Recently many students play the game Minecraft, I don't like playing computer games, but I still downloaded and tried this game just for understand my students better (a5). Although I'm not interested in it, but I will try to understand it, and when we talk about it, there would be something special between me and my students (a6). Students will think that their teacher also plays the same thing with them and our relationship would be drawn closer (a7) … It helps me a lot to hold a class meeting and give lessons (a8)."
Sense making	Cognitive differences	Ability and habit (a2)	
	Reflection	Self-reflection (a3)	
Adapting practice	Trial	Knowing students (a4), (a5)	
	Feedback	Teacher-student relationship (a6), (a7)	
Learning outcome	Teaching competence	Interaction (a8)	

4.4 Results

In order to characterise the learning of novice teachers, the research results will be presented in this section in three parts: 1) the model of novice-teachers' learning in novice–expert interaction; 2) the advice or comments expert teachers provided in this TPD project; and 3) the learning outcomes of novice teachers. These three parts elaborate the process, input and output of teacher learning, respectively. It can be

supported by the Presage-Process-Product-model of teaching and learning (Biggs, 1996).

4.4.1 Learning model

Based on the coding of the interviews, we related all the categories and concepts to construct a model to characterise novice-teachers' learning in the novice–expert interaction-based TPD project (see Figure 4.2). Learning model in this section means the micro-process of teachers' change of behaviour and cognition in novice–expert interaction, which could be regarded as an adaptation of the IMPG in our context. It gives insight into how teachers change within their personal domains and the domain of practice instead of showing how different domains are related to each other.

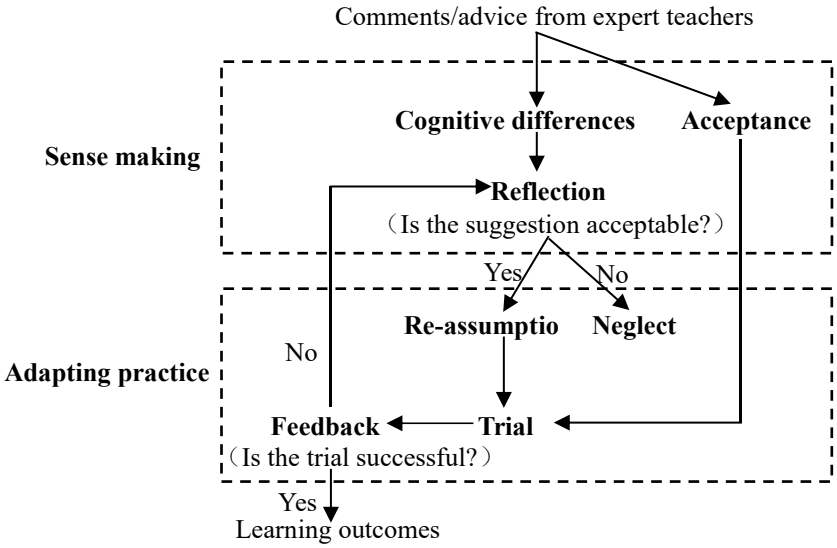

Figure 4.2 The learning model in novice–expert interaction

Comments and advice from the expert teachers could be regarded as the external domain in the IMPG framework. After being advised by expert teachers, firstly, new teachers need to decide what to do with the comments or advice. There are two typical choices from our observation and analysis: acceptance and cognitive differences. If novice teachers directly accept the suggestions, they have to try it in the future in order to trigger 'learning'. If novice teachers do not fully agree with expert teachers, they experience a kind of cognitive difference, which leads to

reflection on why they hold their different views. Then, they have to decide what to do next. Emma was suggested to have more interaction and discussion with her students. However, in our interview she reflected:

> "I think this advice is good, but I just can't do that now because I don't have as much experience as they (expert teachers) do … I may lose control of them (students) when they are too active, and they may say something improper … I guess I can do that spontaneously as I develop."

It shows how Emma reflects on the gap between the expert-teachers' implicit expectations and her own capacity. The cognitive differences here refer to different views and understanding of teaching, and reflection includes how novice teachers explain the differences, and then decide how to deal with the different opinions from experts. This phase is named 'sense making', based on the previous research on teachers' attitudes towards reform (Coburn, 2001; Coburn, 2005; Schmidt & Datnow, 2005; Luttenberg et al., 2013). It shows some similarities with the personal domain of the IMPG, because both involve teachers' knowledge, attitudes and beliefs, which actively interact with the information from the external domain.

The learning process, in the phase of adapting practice, could be regarded as the elaboration of how the domain of practice changes. This phase begins with the decision coming from the sense making phase, and when novice teachers choose to accept a new idea, the learning process would turn into this phase. The core of this phase is 'trial', the main task of novice teachers is trying out alternative methods and revising their teaching. Each trial starts with an assumption like 'It would be better to …', 'Better teaching should be like …', and after their trial, they will check the feedback they get to decide what to do next. After novice teacher Wendy tried a new way in the introduction of her lesson, she said: "… The most crucial experience is my interaction with students who are much more engaged than before". Since the feedback was positive, Wendy kept this new method in her daily teaching, which means the teacher learning progressed from the domain of practice to the domain of consequence. However, if the result of their trial is negative, they have to reflect and re-assume it again, which leads to a new learning cycle. The process for one particular comment ends with a successful trial or a comment that is neglected.

4.4.2 Expert-teachers' comments and advice

In order to have a broad view on the input of this TPD project, we used the framework of teacher knowledge (Grossman, 1990) to categorise the different

comments given by expert teachers (See Table 4.2).

General pedagogical knowledge

The results showed that novice teachers need help with general pedagogical knowledge, just as Tina once said, "At the beginning, I did not know how to give a lesson, and I was trying to imitate what my teachers do in class when I was a high school student". In order to solve the problems novice teachers encountered, much advice on general pedagogy was given. For example, Wendy accepted a suggestion about teaching design, "There's only 40 minutes for a lesson, you cannot use so many examples to explain a topic. You should reduce some cases, but explicate only one case deeply". In the aspect of student learning, experts suggested to Sarah that, "You can put some homework ahead. Let students do something before the class as a preview, instead of leaving all home work until after a lesson. So you can discuss their home work in the class and know where their problem is".

Knowledge of context

In the transcriptions, we found that expert teachers comment a lot on novice-teachers' knowledge of context because of the special situation of Chinese VET education. The knowledge and background of students are frequently discussed in the novice–expert interaction. When analysing Wendy's problem, an expert mentioned that:

> "One of the major problems most young teachers may have, I think, is that the track of growth is so different between you and your students in vocational schools. Our young teachers may have successfully graduated from elementary schools, high schools, and then universities, so when they go to vocational schools and be with the children there for the first time, they will naturally think their students are just like them … when novice teachers teach in a class, they think the lesson they arranged is easy and simple enough for their students, but that's not true … Our children in vocational schools usually grew up in a bad environment, many of them are tired of school, careless, lack of confidence … you need a long time to adapt to your students, and think from their position."

Subject matter knowledge

The subject matter knowledge was also discussed in the novice–expert interaction. For example, when teacher Sarah was giving a lesson called 'Egoism and altruism',

she arranged the lesson in a different order than suggested by the expert teachers. The novice teacher uses the textbook to substantiate her choice, saying:

> "I taught in the order of the text book. The principle that people should not do anything that harms others is set out for the students firstly. Then the reasons follow, which are related to the social attributes of humans."

An expert pointed out:

> "The arrangement of the text book is its own matter. You should realise that the social attributes of humans are actually not the reason for helping people, it's a philosophical framework that should come first, and then the practical level … the choice of being egoistic or altruistic … and I think it would be better not to have an absolute principle in your class."

Through this dialogue, we can see that the expert's understanding of the subject knowledge has gone beyond the textbook, and their own subject matter knowledge is actively involved when arranging a class.

Pedagogical content knowledge

In the process of the TPD project, less comments are found on promoting new teachers pedagogical content knowledge (PCK) than expected, which may because PCK is difficult to teach through providing advice. However, we did observe the PCK of expert teachers when they expressed their own understanding of giving a good lesson. For example, in a moral education course titled 'Participating in Political Life', an expert mentioned:

> "I'm not sure if most of your students understand what "political life" is … I think if you have a better insight of the concept "citizenship", you will find that every one of us can participate in managing public affairs... So his course should help students to explore the relationship between us and the government, and learn students this sense of responsibility for society, which is just what students in vocational schools need … knowing their responsibility as a citizen can transfer into the responsibility for their own lives …"

Through this discussion, we can see that experts pay more attention to students' understanding, and set their own goals for this course based on the understanding of VET students and subject matter. Although novice teachers may understand the

expectation behind the dialogue from the expert, it can be difficult for novice to conduct similar adaption in their teaching because of inadequate knowledge on VET students and subject content.

4.4.3 Learning outcomes

The results concerning novice-teachers' learning outcomes can be found in Table 4.4. The category learning outcome is divided into four concepts and 12 sub-concepts. Each concept was illustrated by a statement of a novice teacher.

Table 4.4 Learning outcomes from novice–expert interaction

Concepts	Sub-concepts	Statements of novice teachers
Teaching concepts	Reframe teaching Self-reflection Understanding students	Sarah: "I used many cases in my class, some of them could be removed, and I should focus on only one or two cases to make a deep explanation for my students."
Teaching competences	Teaching manner Wording Interaction	Wendy: "I pay more attention to motivate my students now … Once I was so focused on finishing my lesson, sometimes I was eager and impatient. I answered my own questions and concluded for my students… (Now) I try to wait my students after I propose a question, and I try to have more discussion with them on their answers."
General strategies	Writing lesson plans Arranging teaching process Re-constructing teaching material	Emma: "Give students choice … I think this suggestion impressed me a lot … They (expert teachers) told me to set multiple choices instead of asking open questions … so even if students don't know the answer, they can still guess it and learn by comparing four choices."
Emotional experience	Career identity Feeling towards students Passion for teaching	Tina: "Through the conversation with experts, I was encouraged, and I realised my potential for teaching, I hope I can keep being a teacher in the future."

Teaching concepts

Teaching concepts, in this study, are defined as the change of novice-teachers' knowledge and beliefs, and consists of three sub-concepts. First of all, the sub-concept 'reframe teaching' means that teachers re-recognised teaching, and had a new understanding of how to manage a classroom, guide students and deal with classroom problems and so on. Second, the sub-concept 'self-reflection' refers to what teachers think of their role in a class. It involves the teacher's basic teaching principles, which belongs to pedagogical knowledge in Grossmans' framework. Finally, the third concept 'understanding students' means that teachers gain more knowledge about the background of students, including the family status of the students, the cognitive level of the students and the psychological condition of the students, which is mainly about the knowledge of context.

Teaching competences

There are also three sub-concepts included within the concept of teaching competences: 1) teaching manner refers to the body language and behaviour in their teaching; 2) wording is about the way a novice teacher expressed the teaching content and the words and sentences used to explain their topic; 3) interaction refers to the criteria of how a teacher should interact with their students.

Teaching competences are similar to pedagogical knowledge, but more general. Although most novice teachers learned some teaching skills, the novice teachers found it difficult to enact all the skills they learned, due to their lack of experience. For example, in a lesson presentation, Tina asked a student to answer her question by calling the seat number. An expert immediately pointed out, "You must remember that you should never call your student's seat number, which makes me feel you are calling a prisoner in jail, and you really need to remember the name of every student in your class". Later, the expert teacher shared some tips on how to remember many students' names in a short time. Although the lack of teaching competences happened for every novice teacher in this programme, it is easily improved, because it is operable and technical. Tina also mentioned the rule of 'remembering students' names' when we interviewed her, and she claimed that she never called students by their seat number again after that.

General strategies

General strategies refer to basic teaching strategies, especially those that can be used

in different classes and do not require an analysis of teaching situations. The strategies novice teachers reported to be learned were quite technical and straightforward; Complicated suggestions from expert were more likely to be neglected. This may be explained by the teachers' knowledge framework. A creative and specific strategies often involves a rich practical knowledge, thus the more complex a teaching strategy is, the more PCK is needed to handle the strategy.

In this study, many general strategies are found in the advice given by expert teachers. For example, the expert teachers told almost every novice to "put some questions ahead before your teaching to guide your students' thinking, and students will be stimulated by interesting questions". Such a strategy is relatively universal and does not require consideration of many complex conditions. New teachers can grasp and imitate this strategy quickly. In the interviews, some novice teachers did confirm that they use this way to start their teaching in daily work.

Emotional experience

Emotional experience is a more unique type of learning outcome because it is actually not the ability of novice teachers, and it can be hardly explained by teacher knowledge. It is merely a perceptual expression of participation in this TPD project. The reason why emotional experience is regarded as a learning outcomes here is because many novice teachers believe that the change of their attitude and feeling is also an important benefit they get from this project. Moreover, emotional experience is tightly related to teacher's professional motivation, which may aid in continuing teachers' further study and improvement over a period of time.

Emotional experience can be triggered by encouragement from the expert teacher. As a novice teacher mentioned in an interview, "being approved by the expert teachers is really necessary for us, because we encounter so much frustration in our classroom". Besides, new insights of teaching and students may also have a positive influence on novice-teachers' emotional experience, as mentioned by Sarah:

> "I used to regard one of my students as the typical vocational one, who is rebellious and uncooperative, but after discussing with them (expert teachers), I think I know my student better and I guess our relationship would be better if I am more sensitive to his needs."

4.5 Discussion and conclusion

In this research, we studied novice-teachers' learning processes in novice–expert interaction at a micro level and developed a model that describes how novice teachers change. To answer the research question, "How can novice-teachers' learning in novice–expert interaction be characterised in the context of Chinese vocational education?" Chinese VET teachers' learning in novice–expert interaction could be characterised in the following steps: 1) comments and advice from expert teachers; 2) acceptance or cognitive differences; 3) reflection; 4) re-assumption; 5) trial; 6) receiving feedback; and 7) learning outcomes. This model provides insights into how novice teachers make sense and change their teaching with the help of expert teachers. This learning model can be understood as an interpretation of the IMPG model (Clarke and Hollingsworth 2002) for the Chinese VET context. The IMPG model shows how the external domain (expert teacher) affects the personal domain (novice teachers) and the domain of practice (novice-teachers' trial). The model of the current study specified changes within each domain. Moreover, the Chinese vocational environment is also embodied in the current model by the detailed explanation of novice-expert dialogues. For example, the model shows that only 'acceptance' and 'cognitive differences' are observed, after novice teachers are informed by expert teachers, but no direct refusal. This may be caused by the Chinese culture of respecting senior people. Novice teachers in this context always provide a reason for refusing suggestions from experts to show that they have considered their opinion seriously.

4.5.1 Implications for professional development of novice teachers

The unique value of this study is that it highlights the function of expert teachers in the professional growth of novice teachers. In this study, novice teachers usually respect the advice and comments of expert teachers, and they see feedback from expert teachers as important external resources for improving their teaching. Moreover, the input of expert teachers makes novice-teachers' learning more intensive and active than learning from their daily work. When novice teachers reflect on their teaching, they usually focus on their effectiveness as a teacher (Borko & Livingston, 1989), which may hinder their reflection on their students' learning and other situated factors. Expert teachers offer more information about alternative teaching methods and feedback about the classroom.

Given the importance of the support of expert teachers, some standards can be

set for expert teachers to optimise the novice–expert interaction. For instance, the experts may align mutual expectations about the interaction, attune to the novices' emotions and adapt the interaction session to novice-teachers' reflective capacity (van Ginkel et al., 2016). The mentioned activities may decrease the cognitive differences novice teachers have towards the advice of experts. Additionally, the organisers of TPD projects are supposed to provide more opportunities for novices and experts to communicate with each other in both formal and informal ways, such as arranging the session time and location according to participants' schedule and creating online communities.

In the current study, novice teachers reported as learning outcome more general strategies and emotional experiences than comprehensive practical knowledge. This suggests the value of novice–expert interaction is not just passing on knowledge to novice teachers, but stimulating, maintaining and giving feedback to novices' practice, which may help novice teachers survive for the first years. This conclusion is consistent with the findings of previous research which shows that mentoring of novice teachers by expert teachers lowers the dropout rate of novice teachers (Ingersoll & Kralik, 2004; Smith & Ingersoll, 2004). This would mean that in a novice–expert interaction-based TPD project support from an expert may be more important than the knowledge they have. Learning of novice teachers is a slow and complicated process. All the learning outcomes from novice–expert interactions need be practised, polished and finally fixed to novice-teachers' own teaching experience.

4.5.2 Limitations

A first limitation is the small scale of our study. The four participants were female and taught general subjects, i.e. Chinese language and moral education. However, the gender and the subjects VET teachers teach may affect the content of novice-expert conversation rather than the learning process, which is the main focus of this study. The learning model developed in this study provides a framework of how novice VET teachers in general make sense of and change their teaching based on expert-teachers' feedback. In the novice-expert interaction, unique problems novice teachers encountered in the Chinese VET context were discussed. These conversations seem to contain information novice VET teachers need in their initial year of teaching.

A second limitation of this study is the planning of the interviews directly following the TPD project. This means that we could not examine how novice

teachers adapted their daily practice to the advice and comments provided by expert teachers after the project ended. Therefore, we suggest future research concerning more long-term effects of this TPD project.

4.5.3 Concluding remarks

Although this study was carried out in the context of a TPD project of VET novice teachers in China, the newly developed learning model might also be used to explain leaning in novice–expert interactions in general schools. However, the input (comments and advice of expert teachers) and output (learning outcomes) of this model may be a bit different when applied to general education. Topics such as handling noisy classrooms, motivating students, attracting students' interest and building a lesson on students' vocational expertise might be more specific for vocational education than for general education. In closing, TPD is a complicated long-term process, and during their development, the support from expert teachers is an important external source, which not only provides active feedback and alternative teaching methods but also encourages and maintains novice-teachers' learning.

Chapter 5

Novice Teachers' Appraisal of Expert Feedback in a Teacher Professional Development Programme in Chinese Vocational Education

This chapter was submitted in an adapted form as:

Jin, X., Tigelaar, D., van der Want, A., & Admiraal, W. (under review). Novice teachers' appraisal of expert feedback in a teacher professional development programme in Chinese vocational education.

Abstract

This study explores novice teachers' appraisal of expert feedback in a professional development programme for vocational schoolteachers. Twelve novice teachers in different school subjects were interviewed after the programme. An appraisal framework with four domains and 12 appraisal categories was built based on coding and analyzing interviews transcripts. In addition, the most frequently occurring appraisal categories and the differences between Chinese language teachers and vocational subject teachers are analysed qualitatively. These findings reveal novice teachers' concerns and expectations about expert feedback as well as provide an appraisal framework for future studies on feedback in teacher learning activities.

5.1 Introduction

In the context of Chinese vocational education and training (VET), feedback from expert teachers is commonly used in many teacher professional development (TPD) programmes to improve novice teachers' teaching. The title 'expert teacher' in China is usually granted by local education committees and given to teachers who have a long teaching experience and outstanding teaching contributions. Some typical activities conducted in teacher development programmes in China are, for example, lesson observations, novice-expert interactions, teacher apprenticeship and master-teacher studios. All these activities involve feedback from expert teachers on novices' teaching, and research has shown that these activities can have positive effects on novice teachers' teaching ability and students' learning (Cui, 2012; Jin et al., 2019; Shao & Zhou, 2013; Zheng, Zhang, & Wang, 2019). In addition, studies from other countries also have evidenced the positive effect of some other forms of expert feedback. For instance, 'video clubs' involves feedback in the form of 'discussions in video club' and 'suggestions and comments on teaching videos', which is found to effectively shift teachers' focus from themselves to students and make teachers begin to relate their pedagogy to student thinking (Sherin & Han, 2004). A more specific impact of expert feedback is studied in the term of mentoring. Mena, Hennissen, and Loughran (2017) found that teacher mentors' role in a mentoring programme affected their feedback to pre-service teachers, and that it caused different learning outcomes. For example, non-directive feedback with less input has been found to improve pre-service teachers' learning of generalized knowledge of practice, while directive feedback with more input often leads to the enhancement of situation-specific knowledge.

Although the effect of expert feedback on novice teachers' learning is widely evidenced, few studies are focusing on the perspectives of novice teachers. Studying novice teachers' perspectives on expert feedback provides information regarding novice teachers' needs and concerns and helps to identify the feedback they perceive as useful for their teaching practice. Thus, to improve the effectiveness of expert feedback in the TPD context, a better understanding of how novice teacher view expert feedback is needed. The purpose of the current study is to examine novice teachers' appraisal of expert feedback in the context of a TPD programme in the Chinese VET context.

5.2 Review of research on the appraisal of feedback

Learners' appraisal of teacher feedback has been studied by numerous researchers in the fields of higher education and second language learning (Meerah & Halim, 2011; Vattøy & Smith, 2019). However, only a few studies examined how teachers evaluate feedback provided by more experienced peers. To provide more insights on teachers' appraisal of expert feedback, we first review studies on feedback content and then on teachers' appraisal of feedback.

5.2.1 Feedback content

The effect of feedback relies not only on how it is formulated, but also on the information it conveys by the provider. Thus it is necessary to make clear what kind of feedback is usually provided to novice teachers in general before we go deeper into novices' appraisal of it. A look into existing feedback practice in the TPD context provides us with some general aspects of feedback content. For example, Chien (2017) examined a TPD programme called 'teaching demonstration', where a group of in-service English teachers were asked to observe each other's teaching and provide feedback to each other on eight aspects, i.e., lesson structure, classroom management strategies, learning activities, teaching strategies, teacher's use of materials, teacher's use of language, students' use of language, and student interaction. Ma, Xin, and Du (2018) studied a teacher online learning programme, in which teachers are asked to provide feedback on each others' teaching plan from three perspectives, i.e., teaching analysis (teachers' analysis of the learners capabilities and needs, and teaching goals), teaching design (the design of learning activities and development of teaching materials), and pedagogies (instruction method and student-teacher interaction). Karagiorgi (2012) also studied a teaching observation activity in a TDP programme for primary school teachers. In the programme, teachers were provided with an observation instrument that allowed them to provide feedback to each other with respect to teaching method, student-teacher interaction, and classroom organization, and including some general comments. In addition, Soslau (2015) focused on developing a feedback protocol to guide the discussion between teacher educators and student teachers. Based on both previous literature and a self-study on her own experience with teaching observations, a protocol with 15 questions was developed. The main questions considered students' prior knowledge, the strategies used to engage students,

teaching objectives, students' feelings about the lesson, and teachers' reflections on the lesson. The above mentioned studies make clear that the feedback to teachers is mostly about the learning and teaching process in class including both instruction and interaction with and among students.

In addition, the specific context may also influence the feedback provided during a TPD programme. Previous research has found that VET students in China show more behaviour problems in class than students in general schools (Ren, 2018; Ma, Zhao, Han, & Zhao, 2018). This might mean that VET teachers, and novice VET teachers in particular, need feedback that focuses on motivating students, managing their classes, adapting their teaching to their students' ability, and setting their goals based the background of their students. In addition, some popular ideas in the Chinese VET context may also be suggested to the novice teacher. One of these ideas is called the 'vocation-oriented teaching method', which requires teachers to relate teaching to students' vocational specialty (even for teachers who teach general subjects, such as Chinese language and English language). This practice is regarded as a good way to motivate vocational students to learn both vocational and general subjects by many important researchers (e.g. Xu, 2012).

5.2.2 Teachers' appraisal of expert feedback

Many studies have examined the effect and addressed the importance of feedback in the terms of 'peer observation', 'mentoring conversation' and 'performance feedback on teaching' (Herbert, Allen, & McDonald, 2018; van Ginkel, Oolbekkink, Meijer, & Verloop, 2016; Sockman & Sharma, 2008). For example, in their study on adaptive mentoring, van Ginkel et al. (2016) found that adapting the mentoring conversation to novice teachers' reflective capacities is one of the most important activities recognized by mentors. The authors claimed that only if novice teachers understand how expert feedback is related to reflections on their functioning would this feedback be effective for their learning and teaching practice. However, what kind of feedback is most appreciated by novice teachers is still not systematically examined, because authors who study mentoring of novice in-service teachers focus more on the procedures and effectiveness of the programme, instead of the content and evaluation of mentors' feedback.

Although, a few studies do provide relevant information for the current study. Wynn, Carboni, and Patall (2007) surveyed beginning teachers' perceptions of mentoring programmes by examining four aspects of mentoring procedures: 1) adequacy of mentors to address concerns, 2) usefulness of mentor feedback, 3)

clarity of understanding of mentoring procedures and 4) adequacy of time to interact with the mentor. The first two were valued the most by novice teachers. More specifically, the support novices wish to receive from their mentors were found to be emotional support, suggestions on paperwork, information about school procedures and feedback on teaching strategies and classroom management. Löfström and Eisenschmidt (2009) also touched upon novice teachers' evaluation of feedback from their mentors. They interviewed 16 novice teachers and asked questions about their relationship with mentors. These novice teachers expressed their satisfaction with both positive and negative feedback from their mentors, the positive feedback was regarded as helpful for developing their professional identity, and the negative feedback was considered as a trigger of their reflection. Another example comes from Thurlings, Vermeulen, Bastiaens, and Stijnen (2012b) who observed, interviewed, and surveyed 12 primary school teachers who participated in a TPD programme involving peer feedback. Their findings showed that teachers usually valued peer feedback that was goal-directed, specific, detailed and neutral as effective, whereas ineffective feedback was often person-directed, vague, non-detailed and either too positive or too negative. In addition, Nami, Marandi, and Sotoudehnama (2016) examined five English teachers about their perception of the different phases of lesson study, and they found that teachers preferred critical reviews over positive feedback because teachers believed that critiques are more meaningful for improving the quality of the lesson plan.

Previous research provides valuable perspectives on what feedback novice teachers may receive from expert teachers and how novice teachers may think about the feedback provided by expert teachers. However, these findings are rather general, without specific information on how and why novice teachers appraise particular feedback. To improve existing feedback-based TPD programmes, a more in-depth understanding of novice teachers' appraisals of expert feedback seems to be necessary. Thus, we formulated our research question as:

- How do novice teachers in Chinese vocational education appraise expert feedback in a TPD programme?

5.3Method

5.3.1 Setting

This research was carried out within the Standard Training Programme for Novice Vocational School Teachers in Shanghai (China). It was an annual programme developed and organized by the Shanghai Municipal Education Committee and the Institute of Vocational and Technical Education of Tongji University (Shanghai, China). The programme aimed to support the development of novice VET teachers by providing them opportunities to interact with expert teachers in their subject domain. These expert teachers were full-time in-service teachers in vocational schools, and there was no formal power relation between expert and novice teachers. The novice teachers participated voluntarily in the programme, and the expert teachers were paid by the local government to work as consultants in this programme.

In the programme at hand, novice and expert teachers were divided into different groups based on the school subjects they teach. Every group consisted of 8-12 novice teachers and 3-5 expert teachers. In the feedback session, novice teachers presented their teaching video one by one, and after having watched each video, the expert teachers provided feedback to the presenter. In this interaction with a novice teacher, the expert teachers were leading because the expert teachers were expected to be consultants in the context of this programme. All novice teachers in the same group could attend each other's interaction meeting, which they usually did, while in most cases only expert teachers provided feedback to the presenter.

5.3.2 Participants

To study the novice teachers' appraisals of expert feedback, individual interviews were conducted to collect data from novice teachers who have participated in the programme. Invitation e-mails were sent to all the novice teachers (n = 144) participating in the programme, and a total of 15 novice teachers responded positively to the invitation. However, three of these respondents failed to attend the interview due to their busy schedule. Table 5.1 shows the characteristics of the respondents. Research clearance has been obtained from the Ethical Committee of ICLON Graduate School of Teaching, Leiden University, file number: ICLON-IREC 2019-09.

Table 5.1 Characteristics of the participating novice teachers

Name	Gender	Teaching experience	School subjects
John	Male	1–2 years	Chinese language
Martha	Female	1–2 years	Chinese language
Ellie	Female	2–3 years	Chinese language
Sophie	Female	1–2 years	Chinese language
Amy	Female	Less than 1 year	Chinese language
Emma	Female	Less than 1 year	Chinese language
Louis	Male	1–2 years	Photography
David	Male	Less than 1 year	Electro-mechanical engineering
Alice	Female	Less than 1 year	Electro-mechanical engineering
Jake	Male	Less than 1 year	Animation
Henry	Male	Less than 1 year	Electro-mechanical engineering
Sarah	Female	1–2 years	Accounting

5.3.3 Data collection

In order to construct an interview protocol to investigate participants' appraisals of expert feedback, typical feedback content needed to be extracted from expert teachers' feedback dialogues. In a pilot study, we transcribed the audio recordings of four feedback sessions in this TPD programme. The four transcripts were segmented and coded based on different feedback content through a bottom-up analysis procedure. The analysis yielded 74 specific categories, which were then clustered into 10 types of feedback content (see Table 5.2). The 10 types of feedback were aiming at 10 aspects of novices' teaching practice, i.e., explanation and summarization, assessment and evaluation, students' experience, teaching content, professional development, lesson design, task and homework, teaching material, engagement, students' future vocation.

These 10 feedback types were included in the interview protocol to prompt novice teachers' appraisals of expert feedback (see Appendix C for the interview protocol). In addition, each of the feedback types was followed by two concrete examples in the interview protocol, so as to help novice teachers to understand the feedback types. Novice teachers were asked to evaluate all 10 types of feedback by indicating how these were addressed in their meeting with expert teachers and how

valuable these were for them. Each interview usually started with a general question: "Out of the 10 types of feedback, which one do you think is the most important and relevant for you? And why?" After the respondents elaborated on their perceptions of the most important feedback, the first author continued with follow-up questions covering all other types of feedback. Some typical follow-up questions were "is there another feedback type you got from expert teachers during the programme besides what we just talked about?" and "so we just talked about the most important ones, then how do you think about feedback type (number and type, e.g., 6. 'improve your lesson design'[see Table 5.2]) ?".

Table 5.2 Ten types of feedback and examples

Feedback types	Teaching aspects	Examples
1. Provide proper explanation and summary for your students	Explanation and summarization	"Give a more precise explanation for students when introducing a new concept." "Provide summary at the end of the lesson to emphasis the main point."
2. Assess and evaluate your students	Assessment and evaluation	"Observe students' reaction in the class and provide feedback." "Encourage your students by providing more compliments when assessing their homework."
3. Relate your teaching to students' experience	Students' experience	"Use cases that students have experience with." "Relate the current lesson to what students' prior knowledge."
4. Arrange the lesson according to the main point of teaching content	Teaching content	"Remove irrelevant cases." "Relate task and homework to the main point of the lesson."
5. Work on your long-term professional development	Professional development	"Ask support from colleagues when you have a problem in teaching." "Improve your knowledge and experience on the subject content."
6. Improve your lesson design	Lesson design	"Re-arrange the sequence of your presentation." "Prepare intriguing questions in the introduction part of the lesson."
7. Provide proper tasks and homework	Task and homework	"Adapt the tasks/homework to your students' level." "Provide more clarity about what students have to do for their tasks and homework."
8. Improve the quality of teaching materials	Teaching material	"Include the latest concept and information in your teaching materials." "Use different forms of teaching material."
9. Engage with your students	Engagement	"Encourage students to present and share work with each other." "Include more interactive activities in your teaching to motivate students."
10. Relate your teaching to students' future work situation	Students' future vocation	"Use the authentic task that happens in students' future workplace." "Make examples with real cases in the workplace."

5.3.4 Coding procedures and analysis

To answer the research question (How do novice teachers in Chinese vocational education appraise expert feedback in a TPD programme?), the coding and analysis of the 12 interviews were carried out in the following four steps:

Label the transcribed text. After transcribing the audio-recorded interviews, the text was labelled based on the aspects from which novice teachers appraised the 10 types of feedback. The authors used a coherent and continuous opinion towards certain feedback as an analysis unit, no matter the length or the number of sentences. Each unit of analysis was labelled as one appraisal, and 197 units of analysis were preliminarily labelled throughout the entire transcript. Moreover, the authors also marked the analysis units with feedback types to explore the relationship between particular appraisal categories and types of feedback. In Table 5.3, a labelled excerpt from an interview transcript is provided as an example.

Table 5.3 Coded excerpt from an interview transcript

Text	Labels	Categories
Researcher: "Then how about the feedback type 'improve quality of teaching materials'?" Ellie: "I don't think it's very practical and valuable. It's the same cause (with another feedback talk before), how can you improve it? In Chinese literature teaching, improving the material usually involve providing extra information about the literature, giving more explanation and exploring the value of the literature, there is a risk of over-interpretation. I doubt if it will work out well."	Potential risks in implementing feedback (F8)	Feedback benefit (F8)
Researcher: "Ok, but this type of feedback is not only about the explanation of literature, it's also about adapting and changing the improper content of teaching material." Ellie: "Oh, if so, this feedback is valuable to some extent, but still it's not very practical. For new teachers, you have to have enough content knowledge to find out the improper content, and then change them into a proper way, that won't be easy."	The current level limited the use of feedback (F8)	Teacher expertise (F8)

Note: this appraisal is on feedback type 8 'improve quality of teaching materials'.

Generate and adjust the categories. After the preliminary labelling, the labels were merged based on the similarities of the main issues that novice teachers concerned about when appraising specific expert feedback. For example, labels such as

'problems in managing students', 'don't have enough experience' and 'already be able to do so' were all included in the category 'teachers' expertise'. In total, 23 categories were generated. After that, a discussion between co-authors found that there was still overlap and similarity between some of these concepts. Therefore, the 23 categories were merged again, and this led to 13 categories. To check inter-rater reliability, an independent researcher was invited to code 10% of the data independently by using the 13 categories. Inter-rater reliability was determined by comparing the ratings of the independent coder and the first author (n = 22; Cohen's kappa = 0.788 with a 95% confidence interval 0.602 < kappa < 0.974). Subsequently, differences were discussed, which led to the final 12 distinct appraisal categories. Important changes based on the inter-rater reliability check were: 1) a category called 'potential risks' was merged into the category 'feedback benefit' because the 'risk' was a negative evaluation of feedback benefit instead of an independent appraisal category; and 2) some specific labels were re-categorized, for instance, two labels classified as 'personal needs' previously were re-categorized as 'teacher expertise' because in the transcript when the novice teachers evaluated certain feedback as unnecessary for them, they actually meant the feedback does not fit their current level of teaching expertise.

Group categories into domains. In a further discussion among co-authors, it was found that the final 12 appraisal categories described factors in different aspects of novice teachers' work and learning. Then we grouped them into four main domains based on the different aspects (i.e., 'characteristics of feedback', 'characteristics of teacher', 'characteristics of VET', and 'professional development needs').

Calculate the frequencies. The frequencies of the four domains and 12 appraisals related to 10 types of expert feedback were counted to identify the most frequently mentioned appraisal categories and to show the relationship between appraisal categories and feedback types (see Appendix D).

5.4 Results

In Table 5.4, we provide an overview of the 4 domains and 12 appraisal categories, with an example for each appraisal category. The definition and typecasting of these appraisal categories are elaborated with examples. The findings were also interpreted based on the frequencies of the appraisal categories in relation to feedback types (see Appendix D).

Table 5.4 The list of appraisal categories and the examples

Appraisal domains	Appraisal categories	Examples
Characteristics of feedback	feedback benefit	Martha: "It's important, I think, because a well-designed homework **can help you** to examine your student, so you know if they truly understand, and on the other hand, it extends your students' knowledge of what they had learned in the class."
	feedback frequency	David: "Actually I already can't remember some of the feedback you presented here, but this one about lesson design is very impressive for me because I remember that the expert teachers give me a lot of suggestions about this during the meeting, which makes me pay more attention to it."
	feedback specificity	David: "Mr. Zhang (an expert teacher) not only provide me with some principles of lesson design, but also showed me his own lesson plan and some of the teaching tools made by himself. His design and teaching tools are very visual and specific, and I can do that for my students too."
	feedback adaptiveness	Amy: "It depends on the specific teaching content. For example, I can use some cases or examples related to students' future vocation when teaching practical writing, but there are a lot of lessons that have nothing to do with students' vocational specialty."
Characteristics of teacher	teachers' expertise	Amy: "I think this one is very valuable, because I'm not good at designing lesson, and I do sometimes stray from the topic when teaching."
	teachers' belief	Jake: "I was told to remove some of the irrelevant cases, but I believe these cases can interest my students. I think it would be very hard to motivate my students if I based my teaching barely on the textbook."
	teachers' lessons	Louis: "I don't have that problem ('engage with your students'), because my courses are based on practice training. I have to keep guiding my students on how to operate the camera and how to film through the whole training course, so we have to be engaged, it's not like giving lectures."

Table 5.4 (Continued)

Appraisal domains	Appraisal categories	Examples
Characteristics of VET	students' characteristics	Sophie: "I don't think the creative homework will work out in my class. The vocational students care more about their vocational specialty, rather than the Chinese language."
	school conditions	Sophie: "We usually don't change the teaching material by ourselves, because we have a plan on what and how many lessons need to be taught in each week, it is planed by the Teaching and Research Group (a widely conducted school-based teacher learning community in China). If you want to change the material you use or even change the consequence, you need to inform the group. I don't want to make thing complicated."
	opportunities and resources	John: "Long-term professional development involves a lot of issues. You need to learn from others, communicate with peers, and participate in professional development programmes, buy there is not enough cooperation between our school and teacher education institutions."
Professional development needs	external pressure	Henry: "Just like an expert teacher said, this job may be replaced by AI technique in several years. Who knows if this subject I teach may be cancelled in 5 years...they (expert teachers) can share some advice, guidance or experience about how to cope with these situation in general, which is valuable for my long-term development."
	personal needs	John: "As a beginning teacher, currently I don't think I need to do so. I need to focus more on my basic expertise and competency."

5.4.1 Characteristics of feedback

The first appraisal domain 'characteristics of feedback' shows how novice teachers value expert feedback based on their evaluation of feedback features, which consists of four appraisal categories: 1) **benefit**, which is novice teachers' general estimation on how certain feedback may help/hinder their teaching practice; 2) **frequency** describes how frequently certain feedback is provided by expert teachers, and can influence novice teachers' perceptions of the value and importance of particular feedback; 3) **specificity** refers to how detailed the feedback is; specific feedback often targets concrete issues that novice teachers encountered and provides detailed steps on how to improve teaching practice; 4) **adaptiveness** means the transferability of feedback, which indicates whether certain feedback can be applied to multiple teaching situations and content.

In this domain, 'feedback benefit' is the most frequently mentioned appraisal category, and it is related to many different feedback types. The example provided by Martha in Table 5.4 shows how she evaluated the potential benefit of the feedback type 'improve your lesson design' for her teaching practice. Similarly, when appraising the feedback type 'assess and evaluate your students', Sarah reported, "I agree with experts' suggestion on assessing my students more constantly, because this can provide me more information about what problem my students have, and so I can pay more attention to it."

In addition, novice teachers who teach different school subjects seem to have different concerns related to the feedback types 'feedback specificity' and 'feedback adaptiveness'. We found that 'feedback specificity' is mostly appraised by novice teachers who teach a vocational subject. As shown in Table 5.4, David, who teaches electro-mechanical engineering, appreciated the specific feedback he received from expert teachers in the programme. His example also indicates the reason why specific feedback is necessary for novice teachers who teach vocational subjects. Vocational subject teachers need to make procedural knowledge 'visual' to their students, which means that they profit from being informed how to present the knowledge step by step with the help of 'teaching tools'.

The appraisal category of 'feedback adaptiveness' is mostly mentioned by Chinese language teachers when appraising the feedback type 'relate your teaching to students' future work situation'. The reason is explained by Amy as shown in Table 5.4, who does not know how 'relate your teaching to students' future work situation' should be applied in language teaching. Another Chinese language teacher

Sophie also commented, “how am I going to know their future work situation...of course, it would be nice if I can use some materials or cases that are related to their vocational specialty, but it’s not very feasible.”

5.4.2 Characteristics of teacher

The domain ‘characteristics of teacher’ contains appraisal categories that refer to novice teachers themselves. This domain is most usually mentioned by novices teachers when expressing their perceptions of how expert feedback can be adapted to their practice. Three specific appraisal categories are included: 1) **expertise**, which indicates whether the feedback is fit to novice teachers’ current level of teaching; 2) **belief** refers to novice teachers’ understanding of teaching, which includes teachers’ values, perspectives, judgments, personal theories and practical principles; and 3) **lessons**, which is the school subject a teacher teaches, and it includes novice teachers’ consideration of how the nature of the lesson may influence their implementation of expert feedback.

‘Teachers’ expertise’ is the dominant appraisal category in this domain when novice teachers appraise expert feedback because ‘you have to have enough pedagogy and experience to support your teaching practice, you can’t just do that (implement expert feedback) based on nothing’, as stated by Henry, one of the novice teachers. Moreover, ‘teachers’ expertise’ is also used widely by novice teachers to evaluate many different feedback types. For example, a Chinese language teacher John expressed his negative attitude towards feedback type ‘relate your teaching to students’ experience’ because he thought he was not able to implement it with his current teaching level:

> “They (expert teachers) made this suggestion because they are better at managing the class and have more knowledge about students’ experience, but I don’t have that experience and knowledge to do so, that’s why I think this feedback doesn’t suit me.”

Limited expertise is also a reason why David evaluated the feedback type ‘provide proper tasks and homework’ negatively, as he mentioned, “providing proper tasks means you need to make your tasks adaptive to every student...paying attention to every single student in the class and knowing their different level is too hard for me.”

Another finding about ‘characteristics of teachers’ is that the appraisal category

'teachers' belief' is used mostly by Chinese language teachers when appraising feedback types 'relate your teaching to students' experience' and 'relate your teaching to students' future work situation'. As already mentioned in Section 4.1, Chinese language teachers may have different opinions on how they can relate their teaching to their students' future work situations. Concerning the feedback type 'students' experience', there are different kinds of 'experience' that a Chinese language teacher could relate to when teaching literature, and language teachers tend to teach based on their own preferences and choices, explained by John:

> "They (expert teachers) suggested me to relate to students' life experience to make it more understandable for them, but I already built the scaffold by reviewing the prior lesson. I think my students can understand easily ... of course their feedback is very good, but there is no perfect way in teaching language and literature. I want to try my own way first and see how it may work out."

5.4.3 Characteristics of VET

The domain of VET characteristics refers to the features of both the general system of VET in China and the specific VET school where the novice teacher works. 'Characteristics of VET' is also referred to very often by novice teachers. This domain contains three appraisal categories: 1) **students' characteristics**, which refers to whether the feedback is adaptive to vocational students' interest, personality, experience and current level; 2) **school conditions** are the supports and restraints at novice teachers' schools, and these conditions are usually regarded by novice teachers as important factors that affect their implementation of feedback; and 3) **opportunities and resources** refers to the chances and supports a novice has to implement certain feedback.

Within the domain of VET characteristics, the most frequently mentioned appraisal category is VET students' characteristics. Adapting new teaching strategies and methods to students is considered by novice teachers as the biggest challenge when implementing feedback. Martha, one of the respondents, commented in her interview, "vocational school students differ in many ways, such as their personalities, interest and academic level...how to make teaching appropriate for every student is a challenge." Concerning the relationship between appraisal categories and feedback types, 'students' characteristics' is also commonly considered by novice teachers when appraising many feedback types that involve

engaging or motivating students, such as 'relate your teaching to students' experience', 'provide proper tasks and homework', 'engage with your students', and 'relate your teaching to students' future vocation' (see also Appendix D).

The appraisal category 'school conditions' is mainly related to teachers' appraisal of feedback type 'improve quality of teaching materials'. The reason for this might be that the use of teaching materials is dependent on school regulations and curriculum plans. Table 5.4 shows that Sophie refused to change her teaching material because the teaching material is determined together with her colleagues, and she needs to inform the group before she changes her teaching plan or teaching material.

'Opportunities and resources' is a unique appraisal category that is only used by novice teachers to appraise the feedback type 'work on your long-term professional development'. For instance, Martha had a positive appraisal of expert feedback on her long-term professional development because of sufficient resources and support from her school. She reported in the interview:

> "I agree, and I'm actually doing that...We have some teaching skill competitions, and I and my colleagues participated as a team, so we have a lot of chance to discuss many issues during the activity... besides, other teachers in my school are all very nice and willing to help with my problem."

5.4.4 Professional development needs

The domain 'professional development needs' indicates how the expectations of novice teachers on their future development may influence their attitudes towards different types of feedback from expert teachers. Compared to the other three domains, novice teachers mentioned the domain of 'professional development needs' less. This domain contains two appraisal categories, and these are mentioned relatively less in the interviews than the appraisal categories in the other three domains. The first appraisal category '**external pressure**' refers to the pressures on novices teachers' development caused by school regulations, policy requirements and technology development. **Personal needs**, on the contrary, means the internal needs of novice teachers, which usually involve teachers' interests and learning goals.

In this domain, 'external pressure' is mentioned more frequently than 'personal needs', and it is also found that 'external pressure' is mostly mentioned by teachers who teach a vocational subject, rather than Chinese language teachers. The latter

finding might be related to the effect of technology development on teaching vocational subjects. Henry, who teaches bench work in a VET school, expressed his worry about how to keep up with the technology development, and he therefore appreciated the feedback type 'work on your long-term professional development' (see Table 5.4). This concern about technology change is very typical among vocational subject teachers. Louis also commented "In this field (photography), equipment, software, and editing concepts, etc. are all being updated very rapidly...if we don't learn and updated ourselves, what we can teach our students would be outdated, and my students wouldn't be interested."

5.5 Discussion and conclusion

In the current study, novice teachers' appraisal of expert feedback was examined in the context of a TPD programme in Chinese VET schools. The main contribution of the study was that we built an appraisal framework with 4 domains and 12 appraisal categories based on novice teachers' perceptions of different feedback types. In addition, we reported the most frequently mentioned appraisal categories, different appraisals from novice teachers who teach different school subjects, and the relationship between appraisal categories and feedback types. Based on these findings, we discuss three main points.

5.5.1 The pragmatic demands of novice teachers

The four domains generated in our appraisal framework are 'characteristics of feedback', 'characteristics of teacher', 'characteristics of VET', and 'professional development needs'. Findings of the current study show that novice teachers refer a lot to 'characteristics of teacher' and 'characteristics of VET' when asked about their appraisal of expert feedback, which indicates novice teachers' pragmatic attitude towards expert feedback. Their concerns show how they are trying to adapt particular expert feedback to the authentic teaching practice and the specific challenges they encounter. This can be regarded as a unique and original contribution of this study because previous research focused merely on the features of feedback. For example, Thurlings et al. (2012b) found four main dimensions that were underlying teachers' appraisals of peer feedback, i.e., goal/person-directed, specific/general, detailed/non-detailed and positive/negative. Another example is a study on postgraduate students' perceptions of feedback from their university lecturers (Meerah & Halim, 2011), where it was found that students appraise their

lecturers' feedback in terms of frequency, timing, and quality.

Another finding supporting this argumentation is that the specific appraisal categories 'feedback benefit', 'teachers' expertise', and 'students' characteristics' are commonly mentioned when novice teachers evaluate all different kinds of feedback content. This suggests that being beneficial for their future practice, being suitable for novice teachers' current level, and adapting to students' characteristics are the three basic features of effective feedback, no matter what the feedback content is. In the interviews, novice teachers also stressed their expectation of being able to use expert suggestions to solve their practical problems, and they frequently mentioned their concerns with authentic teaching situations. These results are supported by previous research on mentoring, such as van Ginkel *et al.* (2016) who found four adaptive mentoring activities by interviewing 18 mentor teachers. Two of the adaptive mentoring activities are about teachers' expertise, referring to 'adapting the mentoring conversation to novices' reflective capacity' and 'building tasks from simple to complex based on the novices' competence level'. Thus, we emphasize the importance and value of practical advice during the feedback session in TPD programmes.

5.5.2 Different concerns of teachers in different school subjects

Some differences were found between Chinese language and vocational subject teachers, which may imply that teachers in different subject areas have different concerns about expert feedback. The appraisal categories 'feedback adaptiveness' and 'teachers' belief' were both mentioned usually by Chinese language teachers when appraising the feedback type 'relate your teaching to students' future work situation'. This result illustrates how popular education concepts may influence feedback provision as well as feedback receiving among teachers. In the Chinese VET context, teachers are suggested teaching in a vocation-oriented way, also for teachers who teach general subjects. This is because relating teaching to students' vocational specialty is expected to promote students' interest in studying both vocational and general subjects (Xu, 2012). Some Chinese language teachers from the current programme seemed confused with this educational idea, because much of the content in language teaching has nothing to do with students' vocational specialty. This finding indicates that the idea of suggesting all VET teachers to teach in a vocation-oriented way, needs to be reconsidered. In addition, 'teachers' belief' was also referred to by Chinese language teachers when appraising feedback type 'relate your teaching to students' experience', and it could be explained by the

characteristics of language teaching. Borg (2006) has found that teaching language requires a teacher to have a wide range of knowledge, so they can be creative and flexible in their classroom and provide various cultural perspectives to their students. This means that there are many different kinds of 'student experience' that Chinese language teachers can touch upon in their teaching, such as students' prior knowledge on the subject content, life experience, and cultural perspectives. Chinese language teachers' could make such decisions based on their own beliefs.

Concerning vocational subject teachers, the appraisal categories 'feedback specificity' and 'external pressure' were frequently mentioned when appraising expert feedback. As suggested by many previous researchers, vocational subjects are supposed to be taught in a competence-based and vocation-oriented method, and teachers should be adaptive coaches and role models who provide enough skills training (de Bruijn, 2012; Wijnia, Kunst, van Woerkom, & Poell, 2016). Thus, teachers in vocational subjects need to combine their professional skills and pedagogy, and that might cause them to be concerned with 'feedback specificity', such as how to transfer expert feedback into concrete steps in their teaching of procedural knowledge. In addition, the characteristics of vocational subjects also explain novice teachers' concerns about 'external pressure' because teaching a skill-related subject requires teachers to update their knowledge and keep pace with the rapid development of technologies in today's world. This is also argued by other researchers in the VET field, such as Broad (2016). She emphasised that VET teachers need to keep updating their knowledge through workplace learning, which is crucial for them to transfer vocational knowledge from occupations to classrooms.

5.5.3 The generalization of the appraisal framework

Although the current study is based on a Chinese VET context, we argue that the appraisal framework we built can be used as a generic tool in different vocational education contexts and other education sectors. There is only one domain that is specifically about the context, i.e., 'the characteristics of VET', and some of the appraisal categories in this domain may present a number of unique results. For example, the appraisal category 'students' characteristics' is one of the most commonly mentioned appraisal categories in our study. A possible reason for this is that VET students often have more behaviour problems, lower learning motivation, and lower performance compared to students in general secondary schools in the Chinese context (Ren, 2018; Ma, Zhao, Han, & Zhao, 2018), and this could urge novice teachers to consider how to apply expert feedback in a way that helps their

students most. Taking into account the specific context seems worthwhile when building a framework for investigating feedback, also in other education sectors, such as special education, higher education and early childhood education. For instance, Finlay, Kinsella, and Prendeville (2019) examined the special challenges and needs in the development of primary teachers in special classes. Some context-related challenges were managing challenging behaviour, suitably motivating pupils and assessing the needs of children. The support special education teachers need in their professional development are help from Middletown Centre for Autism, principal involvement and suggestions from the school psychologist. All these local and contextual concerns of special education teachers can be well appraised by the domain 'characteristics of VET' in terms of 'students' characteristics', 'school conditions' and 'opportunities and resources', although the name of the domain should be changed when it is used in other education sectors.

5.5.4 Limitations and suggestions for further research

We compared the differences between teachers who teach different subjects in a qualitative way. The participants were roughly grouped into Chinese language teachers and vocational subject teachers, and the vocational subject group consisted of four different subjects. Also, female teachers were dominant for the Chinese language group, whereas the vocational subject group contained more males. Therefore, the differences between the two groups of teacher could be affected by irrelevant variables. We suggest future studies to focus on the effects of the school subjects on teachers' appraisal of expert feedback in a more strictly designed context.

When analysing the data, the frequencies of each appraisal category were calculated, however, these frequencies were merely interpreted qualitatively. Future research might conduct quantitative research on comparing teachers who teach different school subjects and exploring the association between feedback types and appraisal categories as a follow-up of the qualitative results we found in the current study.

5.5.5 Practical Implications

The comprehensive framework of appraisal domains and categories highlights the importance of novice teachers' features and the characteristics of the context when evaluating expert feedback. This has consequences for mentors and educators, who are supposed to provide feedback that is adapted to the level of mentees and the

specific educational context. This would mean that mentors and teacher educators need more practical experience in the similar teaching situation that novice teachers are struggling with so that they can provide more realistic and relevant feedback for novices' teaching practice. Furthermore, novice teachers' concerns with regards to 'characteristics of VET' also show that the environment, resources, and opportunities are associated with novice teachers' development, which places a demand on school management. Flexible regulations, subsequent teaching resources, supportive colleague relationships, and responsible leadership would be necessary for novice teachers to apply what they learned from expert feedback into practice.

Some most frequently mentioned appraisal categories are found to be 'teachers' expertise', 'students' characteristics' and 'feedback benefit', which suggest these are the fundamental issues all novice teachers concern about. These results provide important information for mentors and teacher educators on what they should focus on when giving feedback and how they should formulate their feedback. We suggest that mentors and teacher educators should provide feedback that fits the level of novice teachers and their students, and the benefits of feedback should be explained to novice teachers to enhance their acceptance of the feedback.

Different appraisals were found between Chinese language teachers and vocational subject teacher, which provides insight into the different learning needs of teachers in different school subjects. Their different learning needs should also be taken into consideration when organizing teacher induction or TPD programmes involving feedback. For example, feedback with various perspectives and alternative methods that can be used in different conditions may be more useful for a language teacher, whereas highly detailed and specific feedback may be more appropriated for novice teachers in technical subjects.

Chapter 6

Novice-expert Interaction in Teacher Professional Development in China: An Analysis of Expert Feedback

This chapter was submitted in an adapted form as:

Jin, X., Tigelaar, D., van der Want, A., & Admiraal, W. (under review). Novice-expert interaction in continuous professional learning in China: An analysis of expert feedback.

Abstract

In the teacher professional development (TPD) programme in Chinese vocational education and training (VET), expert feedback plays an important role in activities such as mentoring, lesson observation and evaluation and expert-teacher workshops. Previous research examined the general setting of these programmes and did not go into depth about the role of feedback. In this study, feedback has been explored through a TPD programme, in which expert teachers in Chinese vocational schools provided feedback to novice teachers based on their teaching videos. In general, the analysis of the dialogues between novice and expert teachers represented a positive and constructive way of providing feedback. In addition, expert teachers of vocational subjects demonstrated a more problem-oriented, straightforward and structured approach to providing feedback than expert teachers of Chinese language and moral education. Finally, when expert teachers and novice teachers taught the same subject, the expert feedback provided was more informative and profound than feedback from experts teaching a different subject to their novice peers. Suggestions for future research and practical implications are discussed.

6.1 Introduction

In teacher professional development (TPD) programmes in China, novice-expert interaction is an essential part of the learning activities. For instance, expert-teacher studios, lesson observations and teacher apprenticeship have all proved to be effective for novice teachers' learning (Cui, 2012; Shao & Zhou, 2013; Zheng et al., 2019). Internationally, similar activities such as 'mentoring', 'coaching' and 'supervision' were widely found to be effective in promoting professional identity and increasing the efficacy, retention and teaching performance of novice teachers (Elliott et al., 2010; Ingersoll & Kralik, 2004; Izadinia, 2016a; Shields & Murray, 2017; Smith & Ingersoll, 2004). In all these different novice-expert interaction activities, expert feedback seems to be a crucial factor.

In China, 'expert teacher' is a title granted by local educational committees. In the context of Chinese vocational education and training (VET), feedback from expert teachers is even more essential to facilitate novices' learning due to the limited initial teacher education for VET teachers (Li & Yang, 2013; Lu, 2019). In Chinese vocational schools, teachers of general subjects (such as Chinese language, English and mathematics) have usually graduated from universities, where they study pedagogy and specific school subjects. Teachers in vocational subjects (such as accounting, mechanical engineering and architecture) are usually experienced workers from industry without an educational degree. Therefore, feedback from expert teachers could be helpful in further developing vocational novice teachers' knowledge base and improving their teaching ability (Jin et al., 2019; Talbert, 1992). The current study aims to explore expert-teachers' feedback in a novice-expert interaction-based TPD programme in Chinese vocational education.

6.2 Theoretical background

6.2.1 Feedback in teacher professional learning

Although feedback plays an important role in teacher professional learning programmes such as 'mentoring', 'peer collaborative learning' and 'lesson study', the general setting of these programmes is mostly examined instead of the nature of the feedback. Hairon et al. (2019) found that feedback on lesson observations is one of the most effective modes of delivering mentoring from the perspective of the novice teacher. Capizzi et al. (2010) investigated the effectiveness of consultation from expert teachers who watched novice teachers' teaching videos. They found that

feedback from expert teachers can increase the number of lesson components and enhance behaviour-specific praise in novice teachers' subsequent lesson. Research conducted in China yields similar conclusions. Lee and Feng (2007) investigated eight dyads of mentoring teams and indicated that feedback-based learning activities can potentially lead to changes in novice-teacher teaching. Although the concept of 'feedback' was not used literally in their study, expert feedback seemed to be part of 'interaction in lesson observation' and 'monitoring and revising lesson plans'. At the end, Lee and Feng concluded that more support should be provided to mentors to develop their mentoring and feedback-providing skills. In a recent Chinese study exploring how novice vocational teachers learn from expert feedback, Jin et al. (2019) found that expert teachers' feedback could influence novice teachers' teaching concepts, teaching competences, general strategies and emotional experience.

Not only the feedback content, but also how feedback is formulated is an important factor for novices' learning. Mena et al. (2017) examined the mentoring conversation from four mentoring teams using the MERID model, where four mentor roles are defined, namely initiator, imperator, encourager and advisor. Feedback from different mentor roles is associated with different learning results. For instance, the role of encourager can facilitate the elicitation of inferential professional knowledge, and the poor use of the imperator role may lead to poor mentoring relationships. Moreover, van Ginkel et al. (2016) explored the adaptive mentoring activities and the characteristics of adaptive mentors. They found that one of the adaptive mentoring activities is adapting the mentoring conversation to novice teachers' reflective capacity, and adaptive mentors are more likely to support novices' construction of personal practical knowledge. These findings highlighted the importance of the different ways of providing feedback.

As well as the way in which feedback is provided, the school subject teachers teach may also affect novice-expert interaction. In a study that surveyed and interviewed 149 mentoring teams, the participating teachers indicated that unmatched participants (teaching a different school subject) were one of the common problems they encountered, and that can lead to a negative impact on novices' confidence in their mentors and the programme (Kilburg & Hancock, 2006). Achinstein and Davis (2014), argued in a study that subject-specific mentoring is important for providing novice teachers with a knowledge/practice base (pedagogical content knowledge and knowledge of content-specific assessment) and furthering novices' content-teaching abilities. Yet views on the importance of

subject and grade matching in novice-expert interaction differ. For example, Stoll and Louis (2007) argued that heterogeneity in the teacher learning community is necessary due to the diverse and rapidly changing society. Moreover, feedback from non-teaching staff (nurses or teaching assistants) or different subject teachers is believed to be crucial for TPD in the early childhood and special education fields (Louis & Gordon, 2006).

6.2.2 Characteristics of feedback in novice-expert interaction

Most studies on mentoring have a general focus and do not provide much insight into the characteristics of expert feedback. In this study, we adopted the model of Nelson and Schunn (2009) to address the features of expert feedback (see Figure 6.1). In their model, different feedback is divided into two aspects. 'Summarisation', 'specificity', 'explanations' and 'scope' are cognitive in nature and focus on improving the understanding of learners. 'Affective language' is affective in nature and associated with increasing learners' agreement. Most of the features mentioned in this model are assumed to affect the implementation of feedback positively (solid lines), but some features are regarded as unconfirmed, non-effective or even negative in facilitating the implementation of feedback (dotted lines).

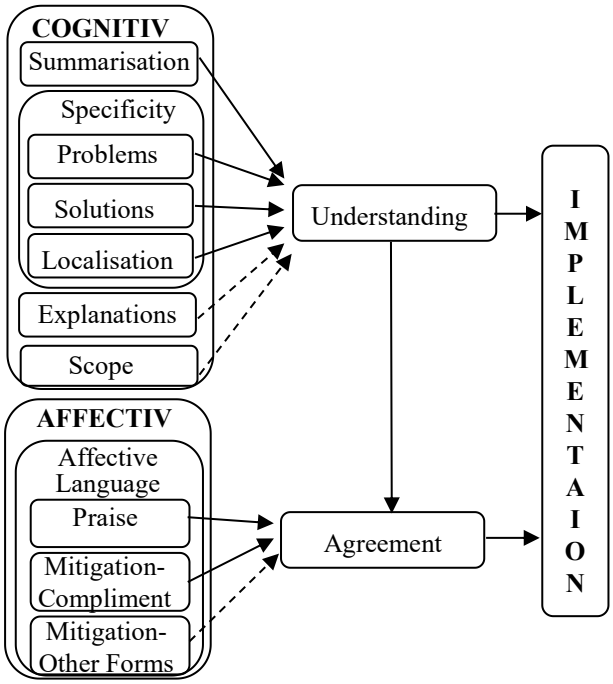

Figure 6.1. The feedback feature model. From Nelson and Schunn (2009). p. 377

'Summarisation' refers to condensing and reorganising the information in teaching videos pertaining to a particular behaviour into chunks. 'Specificity' consists of three subcategories, i.e. 'problems', referring to the detecting of existing mistakes; 'solutions', providing specific approaches in changing behaviour; and 'localisation', showing where a particular problem is. 'Explanations' clarifies the purpose of feedback, which is normally used to address why a certain problem exists. The 'scope' is described on a continuum of levels ranging from local to global, which indicates how general or specific a feedback is. The feature 'affective language' in the model contains three subcategories: 'praise' refers to directly positive comments; 'mitigation-compliments' are critical in nature, and compliments are used to make criticisms less abrasive; 'other forms of mitigation', such as hedges, personal attribution and questions, are assumed not to positively affect the supplementation of feedback.

The model was first constructed in the context of literature writing, but in the current study it is applied to teacher learning in the context of novice-expert interaction in Chinese vocational education. Moreover, the impact of different subjects are also examined, because that may affect novice-expert interaction according to the literature reviewed above. The following research questions directed our study:

- What are the characteristics of feedback that experts provide in novice-expert interactions in the teacher learning context?
- How does expert feedback differ between expert teachers of general subjects and expert teachers of vocational subjects?
- How does expert feedback differ between expert teachers who teach the same subjects as novice teachers and expert teachers who teach different subjects as novice teachers?

6.3 Method

6.3.1 Setting

This research was carried out within the Standard Training Programme for Novice Vocational School Teachers in Shanghai (China). This is an annual programme aimed at supporting the development of novice VET teachers. The novice teachers participate on a voluntary basis, and the expert teachers are paid by the local

government for their participation. In 2018, there were 144 novice teachers and 49 expert teachers participating in this programme when we collected the data.

During the programme, novice and expert teachers were divided into different groups based on the subjects they teach. Each group consisted of either general or vocational subject teachers, and included eight to twelve novice teachers and three to five expert teachers. Furthermore, each group was either matched or mixed, i.e. the matched groups comprised novice teachers and expert teachers teaching the same subject, and the mixed groups consisted of novice and expert teachers teaching different subjects within similar domains (e.g. traffic and transportation, and mechanical engineering in vocational subject group 1 in Table 6.1). In every group, one by one, each novice teacher presented the most important part of his or her teaching video, and subsequently the expert teachers provided feedback to the presenter. Within each group, all the novice teachers could attend each other's video presentation and feedback session; however, only the expert teachers provided feedback after each presentation. A typical feedback session for one novice teacher took about 30–50 minutes (including one video presentation from a novice teacher and the feedback from the experts for that particular presenter).

6.3.2 Participants and data collection

Table 6.1 provides an overview of the groups and participants in the current study. In total, 30 novice teachers were willing to be recorded, and they were in different groups. General group 1, and vocational groups 2 and 3 consisted of both novice and expert teachers teaching the same subject (matched). Novice teachers and expert teachers in the other three groups taught different though similar subjects (mixed).

Table 6.1 Profile of teachers in the sample

Group	Detailed subject	Codes of novice teachers	Codes of expert teachers	Subject matching
General subject group1	Chinese language	NG1, NG2, NG3, NG4, NG5, NG6, NG7, NG8, NG9, NG10	EG1, EG2, EG3, EG4	Matched
General subject group2	Chinese language, Moral education	NG11, NG12, NG13, NG14, NG15	EG5, EG6, EG7, EG8	Mixed
Vocational subject group1	Traffic and transportation, Mechanical Engineering	NV1, NV2,	EV1, EV2, EV3, EV4	Mixed
Vocational subject group2	Accounting	NV3, NV4, NV5	EV5, EV6, EV7	Matched
Vocational subject group3	Mechanical Engineering	NV6, NV7, NV8, NV9, NV10, NV11	EV8, EV9, EV10, EV11	Matched
Vocational subject group4	Architecture, Electronics	NV12, NV13, NV14, NV15	EV12, EV13, EV14, EV15, EV16	Mixed

Note: NG = novice teacher in general subjects, EG = expert teacher in general subjects, NV = novice teacher in vocational subjects, EV = expert teacher in vocational subjects

6.3.3 Data analysis

All 30 feedback sessions were recorded and transcribed verbatim. Then expert feedback was segmented into dialogues, which in this article means a meaningful unit composed of coherent continuous talk on a single topic or theme (Chi, 1997). From these 30 records, 120 dialogues (62 from general subject teachers, 58 from vocational subject teachers) were extracted. After that, the features in these dialogues were coded. A coding scheme was developed based on Nelson and Schunn's (2009) feedback feature model. The original framework of Nelson and Schunn was constructed in the field of writing, which is different from the context of the current study. Thus, the original concepts were adapted and a final coding scheme (see Table 6.2) was established based on a detailed study of the transcripts and pilot coding with a second coder. The criteria and descriptions in the coding scheme were modified in several analysis rounds. Subsequently, every dialogue of expert feedback was coded by different features, such as 'summarisation', 'localisation' and 'problems' etc. Inter-rater reliability was determined by

comparing the ratings of two independent coders (n = 91; Cohen's kappa = 0.816 with a 95% confidence interval 0.730 < kappa < 0.903). In Table 6.3, a typical dialogue from transcript is provided to illustrate how the coding process was conducted.

Table 6.2 Final coding scheme

Feedback feature	Sub-features	Operational definition	Examples
Summarisation	Summarisation	A list of the topics discussed in the class, a description of the goals the teacher was trying to achieve, or statements of an action taken by the teacher.	"Let's have a look at your general content. This course actually contains two parts, one is filling in the cheque, another is filling in the paying-in slip ... which are the main points of your teaching." (Dev7-nv4)
Specificity	Problems	Something that needs to be changed, potential risks or actions that need to be discussed in teachers' teaching.	"...This makes your teaching a little bit dull and flat, our students in vocational schools may not like it." (Deg4-ng5)
	Solutions	A solution is a possible improvement that can be made, an alternative suggestion that's worth a try, or a general direction that novice teachers need to move toward.	"...but we could change our mind and routine, by which I mean we should bring out the most important content first then all the other information." (Deg1-ng6)
	Localisation	Clues of the location where the problem/solution/ praise is.	"I saw the boy who answered your question in the video was talking about his own understanding ..." (Dev5-nv4)
Explanation	Explanation	Elaboration of a problem/solution/ praise that contains information about why the problem exists, the solution is necessary, or why a good action needs to be kept.	"Students can only learn from doing things and making mistakes, only in this way can the theory you teach become a part of their own knowledge base. That's why we emphasize the task-oriented teaching so often." (Dev5-nv5)

Table 6.2 (Continued)

Feedback feature	Sub-features	Operational definition	Examples
Affective Language	Praise	Complimentary comment or identifying a positive feature in the teaching.	"During your teaching, I feel you are very prepared and experienced, although you are still a new teacher." (Dev6-nv5)
	Mitigation-Compliment	An explicit compliment or positive modifier used to describe a problem/solution.	"The general routine is pretty good, but I think there are some details that could be enriched." (Dev15-nv13)
	Mitigation-Other forms	Includes downplay (i.e. minimize the degree to which a problem is bad) and questions (i.e. use questions to identify a problem/solution or probe for more information).	"What's the aim and value of this course? And what does this textbook consist of?" (Deg5-ng11)

Table 6.3 Coding example

Dialogue Dev8-nv10	**Codes**
"Although another expert teacher already mentioned this a little bit, I still need to repeat it again. The first thing you need to do as soon as your students go into the training room is safety education. You should keep doing this every time when teaching in a training room (a).	(a) Solution
This is a very important aspect of professional ethics, and professional attitude (b).	(b) Explanation
At the beginning when the students come in, they were laughing and talking (c),	(c) Localisation
that is not supposed to happen … Secondly, you mistake the course title as the vocational subject in your teaching plan (d).	(d) Problem
This misunderstanding shows that you need to clarify the relationship between the specific course you teach and the vocational professions students are in. It's something necessary for us to do, you can't only focus on your course, you need to know what the role of your course is in different vocational professions and what students in different vocational professions need (e)."	(e) Solution

To answer the first research question on the characteristics of the feedback provided by the expert teachers, we quantified the qualitative data by working out the proportion of each type of feature in all 120 dialogues, because the absolute number of features is easily affected by the length of dialogues. With the proportion of different types of features, dialogues can be compared with each other. The quantified data were arranged in a table with 120 rows of dialogues, and eight columns of features. For instance, Dialogue Deg2-ng1 contains five features (100%) in total, which include one 'praise' (20%), one 'mitigational-other form' (20%), one 'problem' (20%), two 'solutions' (40%) and all the other features are recorded as 0%. Moreover, the connotation of these features was elaborated based on comparing the new adaption with the original concepts in Nelson and Schunn's (2009) model (which is based on feedback in writing learning), so the special characteristics of feedback between teachers can be revealed.

To answer research question two on possible differences between feedback provided by experts in general and vocational subjects, we used an independent-sample *t*-test to compare the mean percentages of the feedback features provided by vocational and general subject teachers. Furthermore, to gain insight into the possible differences between individual teachers, we also compared the feedback features provided by several expert teachers who provided at least five feedback dialogues.

To answer research question 3 on possible differences between feedback provided by expert teachers in matched and mixed groups, an independent-sample *t*-test was also used to compare the mean percentages of the feedback characteristics provided by expert teachers in matched groups (i.e. general subject group 1, and vocational subject groups 2 and 3) and mixed groups (general subject group 2, and vocational subject groups 1 and 4).

6.4 Results

6.4.1 Characteristics of the feedback provided by expert teachers during novice-expert interaction

As shown in Table 6.4, most of the expert teachers provided more constructive suggestions than affective support. In particular, 'solutions', 'explanations' and 'problems' are the most prominent features in expert teachers' feedback. Moreover, some special characteristics in expert teachers' feedback were found in comparing with the original definition of concepts in Nelson and Schunn's (2009) model.

Table 6.4. Means and standard deviations on the percentage of feedback features in all dialogues

Feedback features	M	SD
Summarisation	2.45%	5.45%
Problem	19.41%	13.39%
Solution	26.18%	10.72%
Localisation	12.14%	11.91%
Explanations	21.07%	13.12%
Praise	9.98%	11.48%
Mitigation-Compliment	2.97%	5.85%
Mitigation-Other forms	5.81%	12.83%
Total	100%	

A typical characteristic in teachers' expert feedback is that expert teachers tend to formulate their feedback in a constructive and preventive way. The features 'problem' and 'solution', which were expressed by expert teachers frequently, refer to potential risk situations and alternative methods rather than an actual wrong teaching behaviour that needs to be corrected. For example, in dialogue Dev5-nv4,

immediately after an expert teacher praised a novice teacher for walking around students to provide guidance during a task, he said:

> "… However, the video didn't cover the back side of the classroom, I can't see how exactly you did that … for example, I saw you go to the back side to respond to a student's question … I would remind you not to provide the answer or show them the right operation immediately. Just give them a hint, and let them think."

Another finding is that maintaining good teaching behaviour is an important function of expert teachers' feedback. The feature 'praise' is commonly used to encourage novice teachers to keep implementing some specific behaviour instead of moderating their critique. Moreover, the concepts 'localisation' and 'explanation' were also used to elaborate why certain teaching behaviour is good. In dialogue Deg2-ng2, an expert teacher clearly explained why previewing is a necessary teaching process, and he directly asked the novice teacher to keep doing this:

> "Preview homework you set before the class is good. There is a clear target in the preview homework, which is helpful for interesting your students … so, please keep doing this in the future … I know young teachers nowadays are very busy and tired, and a good preview homework may bring you more work … but that is the only way to make your teaching effective."

6.4.2 Feedback from expert teachers in general and vocational subjects

To compare possible differences between the characteristics of the feedback provided by vocational and general subject expert teachers, we used an independent-sample *t*-test. As shown in Table 6.5, there was a significant difference in the percentage of references to 'problem' in the feedback from general subject expert teachers (M = 16.86%, SD = 13.79%) compared to vocational subject expert teachers (M = 22.13%, SD = 12.50%); t (118) = -2.190, p = 0.030, d = 0.171). Furthermore, 'mitigation-compliments' appeared significantly less often in feedback provided by general subject expert teachers (M = 1.86%, SD = 4.71%) than in feedback from vocational subject expert teachers (M = 4.15%, SD = 6.70%); t(118) = -2.176, p = 0.032, d = -0.395). A radar map (see Figure 6.2) shows the mean value of the feedback characteristics provided by general (GS mean) and vocational subject (VS mean) teachers, illustrating that the general shape of the two groups is

pretty similar. Moreover, the differences between some individual teachers in both groups were also illustrated. Figures 6.3 and 6.4 show the characteristics of feedback from expert teachers who provided at least five feedback dialogues. These figures show a tendency of the expert teachers in general subjects to provide feedback in more differentiated ways, and a tendency of the vocational subject expert teachers to have more similar patterns in providing feedback.

Table 6.5 Mean percentage of features in feedback dialogues from expert teachers in general and vocational subjects

	General subject teachers		**Vocational subject teachers**	
	M	**SD**	**M**	**SD**
Summarisation	2.10%	5.54%	2.82%	5.39%
Problem	16.86%	13.79%	22.13%	12.50%
Solution	26.34%	11.82%	26.00%	9.51%
Localisation	13.31%	12.13%	10.90%	11.64%
Explanations	22.71%	12.47%	19.31%	13.68%
Praise	10.56%	13.98%	9.36%	8.10%
Mitigation-Compliment	1.86%	4.71%	4.15%	6.70%
Mitigation-Other forms	6.26%	13.02%	5.34%	12.73%
Total	100%		100%	

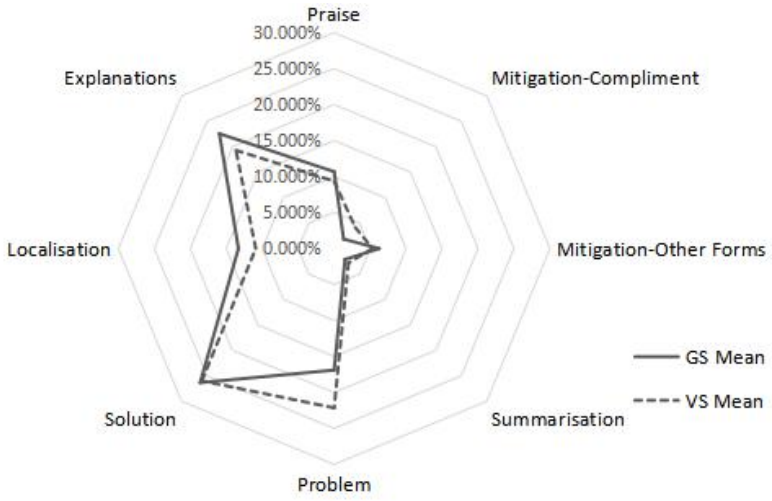

Figure 6.2 Feedback features of general and vocational subject teachers

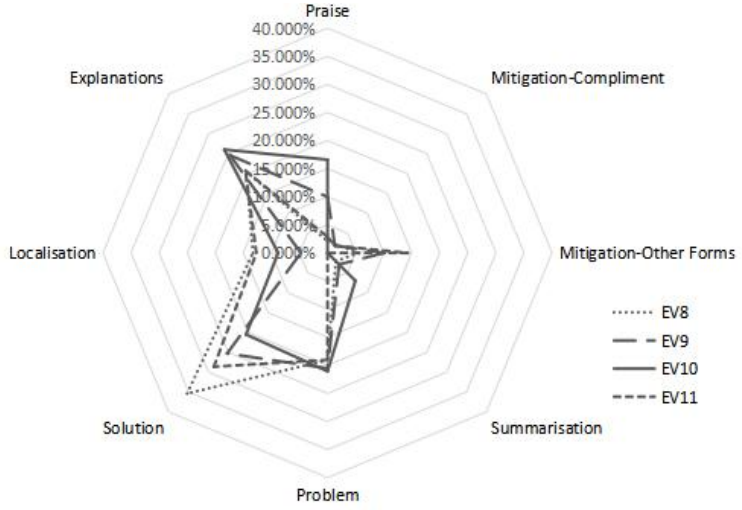

Figure 6.3 Feedback features of four vocational subject

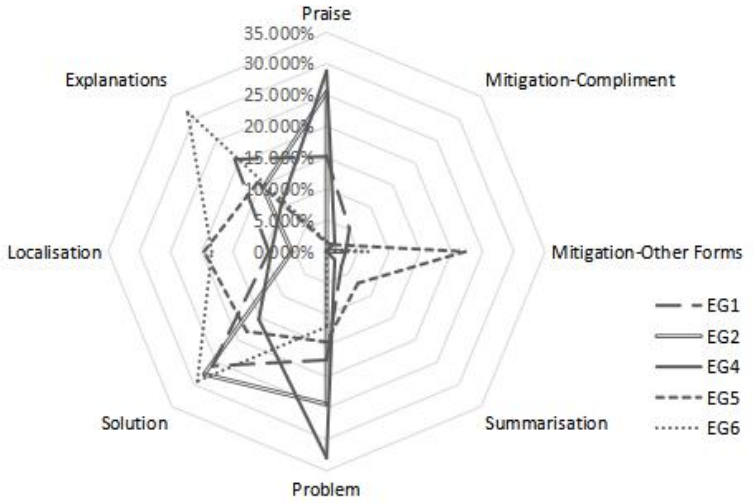

Figure 6.4 Feedback features of five general subject teachers

6.4.3 Feedback from expert teachers in matched and mixed groups

We also compared the mean percentages of the features in feedback provided by expert teachers in matched (general subject group 1, vocational subject groups 2 and 3) and mixed groups (general subject group 2, vocational subject groups 1 and 4).

Table 6.6 shows significant differences in the features 'problem', 'localisation' and 'praise'. The independent-sample *t*-test results show that references to 'problems' occur significantly more often in feedback provided by expert teachers during matched groups (M = 21.78%, SD = 13.48%) than in mixed groups (M = 16.87%, SD = 12.93%) ; t (118) = 2.032, p = 0.044, d = 0.372). References to 'localisation', however, occurred significantly less often in feedback provided by expert teachers during matched groups (M = 8.89%, SD = 9.09) than in mixed groups (M = 15.62%, SD = 13.55%); t (118) = -3.217, p = 0.002, d = -0.583). Furthermore, expert teachers in matched groups (M = 14.26%, SD = 12.95%) usually provided more 'praise' in their feedback than did expert teachers in mixed groups (M = 5.41%, SD = 7.39%); t (118) = 4.554, p < 0.001, d = 0.839). A radar map illustrates the differences in feedback provided by expert teachers in matched and mixed groups (see Figure 6.5).

Table 6.6 Mean percentage of features in feedback dialogues from expert teachers in matched and mixed groups

	Matched groups		**Mixed groups**	
	M	**SD**	**M**	**SD**
Summarisation	3.17%	5.58%	1.67%	5.25%
Problem	21.78%	13.48%	16.87%	12.93%
Solution	25.95%	10.11%	26.42%	11.41%
Localisation	8.89%	9.09%	15.62%	13.55%
Explanations	19.46%	13.43%	22.79%	12.68%
Praise	14.26%	12.95%	5.41%	7.39%
Mitigation-Compliment	2.20%	4.96%	3.78%	6.62%
Mitigation-Other forms	4.30%	8.73%	7.43%	16.03%
Total	100%		100%	

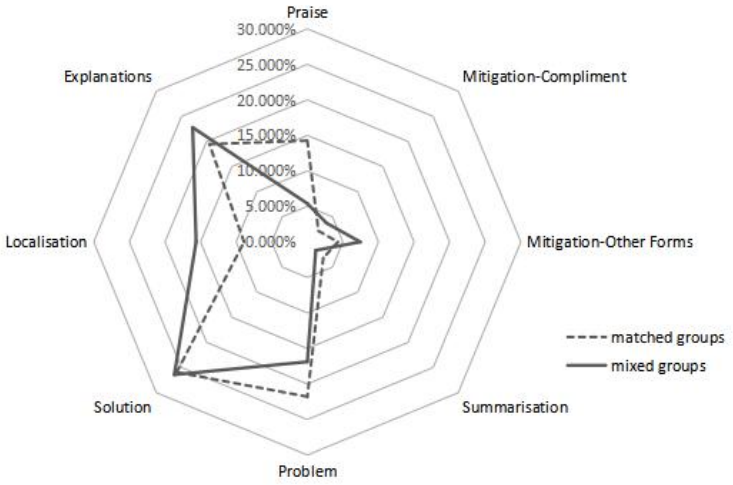

Figure 6.5 Feedback features of teachers in matched and mixed groups

6.5 Discussion and conclusion

This study explored the feedback that expert teachers provided in their interaction with novice teachers in a TPD programme. The findings provide insight into feedback features in the context of Chinese vocational education. This study shows that expert teachers used a constructive, positive and preventative approach in providing feedback as the main characteristic, which means expert teachers focus more on providing alternative methods, maintaining good teaching behaviour and highlighting potential problems. Moreover, expert teachers in general and vocational subjects provide different kinds of feedback. The feedback from general subject teachers seemed less problem-oriented, and there was more diversity and individuality in their feedback. Finally, expert-teachers' feedback in matched groups tended to be more directional and evaluative than the expert-teachers' feedback in the mixed groups. Three aspects will be discussed in relation to the conclusions.

First of all, the results indicate that when an expert teacher provides feedback to novice teachers, changing the novices' teaching behaviour is not the only purpose. Sharing different opinions, reminding them of potential problems and providing alternative methods seems even more important than correcting teaching behaviours. This is possibly due to the complexity, situationality and practicability of learning to teach (Borko & Putnam, 1996; Davis & Sumara, 2014), and to deal with these characteristics, novice teachers need to develop a flexible and adaptive reaction style

in their classroom. Thus, the expert teacher may not require the feedback to be implemented immediately; instead it is supposed to be integrated into novices' knowledge base. This explanation is supported by previous research on teacher knowledge (Davis, 2004; Koehler & Mishra, 2009; Verloop et al., 2001). For instance, Koehler & Mishra (2009) argued in their study that learning to teach is complex and ill structured in nature, so different types of knowledge, teaching strategies and techniques should be integrated with each other, and finally fixed into teachers' teaching practice.

Secondly, this study shows that feedback from teachers in vocational subjects contains more of the features 'mitigation-compliment' and 'problem' than that from general subject teachers. Moreover, the radar maps (see Figures 6.3 and 6.4) illustrate a more homogeneous pattern of providing feedback among expert teachers in vocational subjects than that in general subjects. This could be explained by the different professional backgrounds of vocational and general subject teachers. Since vocational subject teachers usually have a lengthy experience of working in engineering-relevant jobs, they may form a procedural mindset (probe the problem, explain the reason and then provide a solution), which affects their approach to providing feedback. Otherwise, teachers in general subjects may form a divergent mindset. That could lead them to providing more alternative methods without relevance to certain specific problems. Psychology research has provided evidence on the connection between vocation choice and human personality (Berings et al., 2004; Holland, 1997; Mount et al., 2005). For example, Holland (1997) constructed the RIASEC (Realistic, Investigative, Artistic, Social, Enterprising, Conventional) theory of careers. People who work in engineering-relevant fields are characterised as having a 'realistic' type of personality, and are usually good at operations, interested in specific tasks and have low social skills.

Finally, when expert teachers provide feedback to novice teachers who are in the same subject as them (matched groups), they tend to provide more 'praise' and detect more 'problems', but less 'location' than in the group where novices and experts are in different subjects (mixed groups). This suggests that subject matching may affect the intensity and profundity of feedback, which is in line with previous research we reviewed. Achinstein and Davis (2014) argued that a well-matched group can develop novice teachers' pedagogical content knowledge and knowledge of content-specific assessment. The high percentage of 'praise' and 'problems' implies that expert teachers may have a more instructive and evaluative way of providing feedback when they are in the same subject as novice teachers. This may

be because expert teachers have more confidence and efficacy in subjects they are teaching, while expert teachers in mixed groups may cautiously formulate their feedback in a neutral way to avoid giving wrong instruction. The feedback feature 'localisation' refers to the places where the 'problem/solution/praise' is (in the teaching video). A high percentage in 'localisation' may suggest that the expert teachers care more about specific teaching behaviour and content, and it may lead to plain feedback.

6.5.1 Limitations and suggestions for further research

The main limitation relates to our sample, since this research is based on a local TPD programme and the scale of the sample is limited. The small number of participants further constrains the sample grouping: for instance, there are fewer participants in the mixed group than in the matched group, and in the general subject groups, Chinese language teachers predominate. Thus, future research could examine teacher feedback with a bigger sample, which would increase the generalisability of the results.

The findings of this study highlight the importance of a vocational background in providing feedback. However, the vocational subject teachers in this study mostly teach engineering-related subjects. Thus, a wider range of vocational backgrounds should be taken into consideration in further feedback research in order to provide more information on how different vocations affect the feedback interaction in TPD programmes.

6.5.2 Practical implications

Based on the first discussion, expert teachers provided feedback in a constructive, positive and preventative way (sharing alternative methods, maintaining good teaching behaviour and reminding novices of potential problems) in response to the complexity of learning to teach. This implies that sharing, supporting and communication between novices and expert teachers plays an important role in TPD. Thus, we suggest future TPD programmes to provide more approaches to communication, such as experiential learning, dialogic reflection and online learning communities (Li & Craig, 2019; Wang et al., 2019). Only then can novice teachers gain enough experience to build up their own practical knowledge.

Combining the second and third findings, the vocational background of the feedback provider and subject matching are important factors affecting feedback provision. This indicates that developers of novice-expert interaction-based teacher

education programmes need to be more aware of, and targeted at, how to arrange participants in different subjects. For instance, if the programme is aimed at providing novice teacher pedagogic content knowledge and enhancing their understanding of subject content, a matched novice-expert relationship may help. However, for programmes aimed at improving novices' standardized pedagogical skills, subject matching may not be so necessary.

6.5.3 Concluding remark

As an essential part of a novice-expert interaction-based TPD programme, feedback features are generally found to be positive and constructive. Both the subject expert teacher is teaching and the subject matching between novice and expert teachers affect the way in which feedback is provided.

Chapter 7

General Discussion and Conclusion

The main purpose of this dissertation is to provide both an integrated framework for the practices of peer feedback-based teacher professional development (TPD) programme and an in-depth understanding of teacher peer feedback in the Chinese vocational education and training (VET) context. Thus, the studies in this dissertation are focused on both the general frameworks and a specific insight of teacher peer feedback. The studies separately focus on the implementation models (Chapter 2), effects (Chapter 3), teachers' cognitive and behavioral process when learning from peer feedback (Chapter 4), teachers' appraisal of feedback (Chapter 5), and the characteristics of feedback (Chapter 6).

In this final chapter, we first provide a summary of the design and findings of the five studies in section 7.1. Then, in section 7.2, we draw different aspects of findings together to provide a general discussion to contribute to the knowledge of teacher peer feedback. In section 7.3, we reflect on the limitations of this dissertation and propose suggestions for future research. In section 7.4, implication are discussed to improve current practices of teacher peer feedback in TPD programmes, and suggestions for teacher educator and school leaders are provided. Finally, in section 7.5 the main conclusions are summarized.

7.1 Summary of findings in each study

Five different foci on teacher peer feedback formed the domains of study in this dissertation. First, a literature review was carried out to model teacher peer feedback implemented in previous research and provide fundamental information for the following empirical studies. Then four aspects of a local peer feedback-based programmes were studied, i.e. the effects of the programme, teachers' learning mechanisms through peer feedback, teachers' evaluation of feedback content, and the characteristics of feedback from expert teachers. These studies were arranged from generic to specific regarding the focus of peer feedback. Table 7.1 lists the different foci and findings of all the five studies included in this dissertation.

Table 7.1 Overview of main findings in each of the five studies in this dissertation

Chapter	Foci	Main findings
2	Implementation models of teacher peer feedback	1) Four implementation models were constructed: lessen study based peer feedback, research initiated peer feedback, supervisor guided peer feedback and self-regulated peer feedback. 2) Five implementation factors were categorized: characteristics of participants, training and supervision, schedule and duration, support and tools, characteristics of feedback.
3	The effect of the TPD programme	1) The programme led a significant effect on the post-test score of a teacher's self-efficacy on the dimension of student engagement and classroom management. 2) The programme led a significant effect on the post-test score of a teacher's professional engagement on the dimension of planned persistence.
4	Learning mechanisms of peer feedback in the TPD context	1) A model explaining novice VET teachers' learning through novice-expert peer feedback was constructed, which consists of seven steps: comments and advice from expert teachers, acceptance or cognitive differences, reflection, re-assumption, trial, receiving feedback, and learning outcomes. 2) Feedback from expert teachers covered all four types of teacher knowledge, namely, general pedagogic knowledge, knowledge of context, subject matter knowledge and pedagogical content knowledge. 3) Four types of learning outcomes were reported by interviewed teachers: teaching concepts, teaching competences, general strategies and emotional experience.
5	Novice teachers' appraisal of the feedback they received	1)A framework with four appraisal domains (feedback, teacher, VET context and professional development) and 12 specific appraisal categories was constructed to categorize novice teachers' evaluation of feedback from expert teachers. 2)The most frequently referred appraisal categories were 'teachers' expertise', 'students' characteristics' and 'feedback benefit'. 3)Novice teachers teaching Chinese language tended to value 'feedback adaptiveness' and 'teachers' belief', while vocational subject teachers concerned more about 'feedback specificity' and 'external pressure'.

Table 7.1 (Continued)

Chapter	Foci	Main findings
6	Characteristics of feedback provided by expert teachers	1) The descriptive statistics of feedback features in all dialogues showed high percentages of 'problem', 'solution' and 'explanations' were provided in expert feedback. 2) Feedback from general subjects teachers included more 'problem' and 'mitigation-compliments' than that from vocational subject teachers. 3) Expert teachers in general subjects provided feedback in diverse and differentiated ways, and vocational subject teachers tend to have similar patterns in providing feedback. 4) Teachers in matched groups (expert and novice teachers are in the same school subject) provided feedback containing more 'problem' and 'praise', while mixed groups (expert and novice teachers are in the different school subject) provided feedback with more features of localization

Chapter 2 was focused on generating implementation models based on previous practices of teacher peer feedback and identifying the factors that may affect teacher learning effects. In this chapter, the results from a systematic review on practices of teacher peer feedback were described. The following two research questions guided the literature review: *1) How is peer feedback implemented in TPD programmes? 2) Which factors affect the effect of teacher peer feedback in the context of TPD?* We searched empirical articles published during 2000-2020 with the term 'peer feedback' and 'teacher' in combination (also the synonyms of the two terms). After screening, 29 articles remained. It yielded results of four typical implementation models of peer feedback (i.e. lessen study-based peer feedback, research-initiated peer feedback, supervisor-guided peer feedback and self-regulated peer feedback) and of five key factors (i.e. characteristics of participants, training and supervision, schedule and duration, support and tools, characteristics of feedback) that influence teacher learning through peer feedback.

The first finding provided a general framework for future practitioners and researchers to locate the peer feedback activities they conducted, and it also provided information about the characteristics involved in implementing different types of peer feedback. The second finding indicated a variety of influential factors on the effects of peer feedback, and it highlighted the importance of designing a peer feedback activity and controlling the influential factors. Further, we suggested that participants, programme organizers and process supervisors should work together to explore the most effective ways to implement peer feedback by frequently scrutinizing, interviewing or surveying participants with regards to their learning needs, changing expertise, relationship with peers and expectations on the programme.

In **Chapter 3**, the effects of a TPD programme on novice teachers' efficacy and professional engagement were examined. The research questions are: *1) What is the effect of the TPD programme on novice teachers' sense of efficacy? 2)What is the effect of the TPD programme on novice teachers' professional engagement?* To eliminate the influence of novice teachers' improvement caused by increasing teaching experience, a pre- and post-test control group design was used. The scores of participating and non-participating teachers were compared by multivariate analysis of co-variance and paired samples *t*-tests. The analysis yielded positive effects caused by the current programme for participating teachers on two of the three efficacy scales (i.e. student engagement and classroom management) and one

of the two professional engagement scales (planned persistence). No statistically significant effects were found concerning self-efficacy in instructional strategies and professional engagement in planned efforts. Thus, we concluded that TPD programme involving peer feedback between novice and expert teachers generally had a positive effect on novice teachers' efficacy and professional engagement. However, the findings indicated effects of the entire TPD programme, instead of peer feedback, because there were other workshop-style activities involved in the programme.

The possible reason for the unchanged 'instructional strategies' and 'work effort' were discussed. Fuller (1969) has claimed that novice teachers' concerns are more about 'class control, subject matter adequacy and finding a place in the power structure of the school and understanding expectations of supervisors, principal and parents' (p. 211) in their first year of teaching. This may explain the absence of an effect on efficacy in instructional strategies because of its emphasis on student learning. With regard to teachers' work effort, the poor working environment in Chinese VET context may be the main reason of not finding a significant effect. As reported in many Chinese studies, Chinese VET teachers have a lower salary and higher workload than those in a general secondary school (Bian & Zhang, 2019; Chen & Xu, 2011). This means that VET teachers may already work harder than their counterparts in general secondary schools, and that they have almost reached the limits of paying efforts. Finally, it was implied that TPD involving peer feedback should be tailored to novice teachers' learning needs in their current career stage. In addition, policy makers and school leaders should improve the work environment and raise teachers' salaries in Chinese VET schools.

Chapter 4 focused on learning mechanisms (the cognitive and behavioral process of learning) within a teacher peer feedback activity in the context of Chinese VET. We formulated the research question as: *How can novice-teachers' learning in novice–expert interaction be characterised in the context of Chinese vocational education?* To answer the research question, a grounded theory approach was used to analyze the data from four participants from a TPD programme. The data included an individual interview and three peer feedback sessions from each of the participants. With three rounds of coding and categorizing, three main findings were found with respect to a specific model on the learning mechanism in peer feedback, the content of expert feedback, and self-reported learning outcomes from novice teachers (see Table 7.1 for details).

The found mechanism was interpreted in relation to the Interconnected Model of Professional Growth (IMPG, Clarke & Hollingsworth, 2002). The IMPG model shows how external domain (expert feedback) affects the personal domain (novice teachers) and the domain of practice (novice teachers' teaching practice in school). The findings showed learning from peers' feedback is a long and complex process that may cost time to yield outcomes. Furthermore, the other two results, with respect to feedback provided by experts and novice teachers' self-reported learning outcomes, showed that the support from expert teachers is an important external learning resource, which not only provides alternative teaching methods but also encourages and maintains novice teachers' learning. The results suggest that future TPD programmes should provide more opportunities for novices and experts to communicate with each other in both formal and informal ways, so to enhance novices' understanding of expert feedback and promote the long-term effects of peer feedback.

Chapter 5 focused on novice teachers' appraisals of the feedback they received in the peer feedback-based teacher envelopment programme. The research question was: *How do novice teachers in Chinese vocational education appraise expert feedback in a TPD programme?* Twelve novice teachers who participated in the programme were invited for an interview about their opinions of the feedback they received from expert teachers. The interview protocol contained 10 types of feedback commonly provided in the programme, and novice teachers were asked to appraise these feedback types. After transcribing the audio-records of each interview, the text was coded and categorized into four domains and 12 categories that relate to novice teachers' appraisal of expert feedback.

The appraisal framework with four domains and 12 specific categories provided a well-structured tool which can be used in future research or practice to evaluate the quality of peer feedback. The most referred appraisal domains and categories indicated teachers' pragmatic demands on peer feedback. For examples, novice teachers were concerned about how to adapt expert feedback to their own teaching expertise, apply expert feedback in their daily teaching, and make the best use of the feedback to produce positive changes. These concerns were shown by the three most frequently mentioned appraisal categories, i.e. 'teachers' expertise', 'students' characteristics' and 'feedback benefit'. In addition, comparing novice teachers in different subjects showed how teachers' needs and subject characteristics may influence their evaluation of certain feedback. Based on these findings, school

leaders are suggested to create a supportive environment and flexible regulations for teachers' to adapt peer feedback in their teaching practice, and TPD organizers are suggested to consider matching of peer teachers based on their school subject when arranging teacher peer feedback.

In **Chapter 6**, the characteristics of feedback provided by expert were investigated. Three specific research questions guided this study: *1) What are the characteristics of feedback that experts provide in novice-expert interactions in the teacher learning context? 2) How does expert feedback differ between expert teachers of general subjects and expert teachers of vocational subjects? 3) How does expert feedback differ between expert teachers who teach the same subjects as novice teachers and expert teachers who teach different subjects as novice teachers?* The data included 30 audio recordings of novice-expert feedback sessions. The feedback dialogues were coded by the feedback feature framework (Nelson & Schunn, 2009). The coded data were quantified by calculating the proportions of eight different features in the feedback dialogues. With the proportions of the eight feedback features, we conducted descriptive statistics and an independent sample *t*-test to compare the differences between feedback dialogues provided by different types of expert teachers (see Table 7.1 for detailed findings).

Based on the main findings, we concluded that, in general, the feedback dialogues from expert teachers were constructive, because the expert teachers tended to provide fact-based feedback with clear instruction on how to improve. It can be shown by the high proportion of some feedback features (i.e., 'problem', 'solution' and 'explanations') in expert teachers' feedback dialogues. Moreover, the different features in the dialogues provided by different types of expert teachers were discussed. For example, teachers in matched groups (feedback providers and receivers teaching the same school subjects) tended to provide feedback dialogues with more 'praise' and 'problems', but less 'location' than teachers in the mixed groups (feedback providers and receivers teach different school subjects). The possible reason could be that expert teachers have more confidence when providing feedback to novice teachers teaching the same subject, so they can be more corrective and critical; while expert teachers in mixed groups may cautiously formulate their feedback in a neutral way to avoid giving wrong information. These findings suggest that developers of TPD programmes involving peer feedback need to be more aware of, and targeted at, how to arrange participants from different school subjects. When the programme aims at providing novice teacher pedagogic

content knowledge and enhancing their understanding of subject content, a matched novice-expert relationship may help. However, for programmes aimed at improving novices' standardized pedagogical skills, subject matching may not be necessary.

7.2 General discussion

Four aspects of the dissertation are discussed in this section. First, the stance this dissertation has taken in the first place is very unique. We particularly **focused on a common component implemented in many TPD programmes, i.e., peer feedback**. Researchers studying TPD usually focus more on the different context and procedures of the entire TPD programme, rather than solely on peer feedback. Moreover, teacher peer feedback activities can be conducted in different forms, such as 'peer review of teaching' 'peer evaluation' 'teaching demonstration' and 'peer coaching' (Chien, 2017; Iacono, Pierri, & Taranto, 2019; Sanetti et al., 2019). The differences in approaches and terminologies can block us from building an generic framework of both the practice and theory of teacher peer feedback. The current dissertation specifically focused on teacher peer feedback and provided a comprehensive view of the implementation models, their effectiveness, learning mechanisms, participants' appraisals, and feedback characteristics with respect to teacher peer feedback. Then these foci contribute to fundamental knowledge about teacher peer feedback, and also further underline the necessity of considering peer feedback as an independent research topic, rather than a subsidiary part of research on TPD.

Second, the **importance of constructive feedback** was stressed in the results from the empirical studies in this dissertation. In Chapter 4, the learning mechanism found in our qualitative study showed that advises and suggestions on novice teachers' teaching presentation are the main input in peer feedback activities. Chapter 6 with a focus on the features of feedback showed that 'solutions', 'explanations' and 'problems' are the most prominent features in peer feedback. This indicates that expert teachers tend to provided detailed, targeted, timely and fact-based feedback to improve novice teachers' teaching behavior. This is in line with the definition in previous research on constructive feedback. For example, Ovando (1994) pinpointed that constructive feedback for teaching and learning should be relevant, immediate, factful, helpful, confidential, respectful, tailored and encouraging. Therefore, we argue that providing constructive feedback should be the core function of teacher peer feedback activities, and this further highlights the

importance of guiding teachers to provide feedback in the most effective way during a peer feedback activity.

A third important fact that should be noted is that **peer feedback takes time to yield positive results**. Based on the results in Chapter 4, the learning mechanism we described showed a complicated long-term process, in which novice teachers not only need to accept and implement feedback, but also need to adapt the alternative teaching method and new ideas into their daily teaching practice. Also, results in Chapter 4 showed that only if expert feedback is successfully applied several times, novice teachers can establish a new teaching approach pattern. This finding is supported by previous research. Nami, Marandi and Sotoudehnama (2016) reflected on the results of their study on an in-service teacher education course and argued that the limited time participants attended the programme may have prevented to show the effects of the programme, and they believed better results would have been obtained if teachers would have had the opportunity to engage in the programme for a longer period. Furthermore, Pearce et al. (2019) conducted their study based on a two-year peer-coaching programme, and they argued it is the adequate time that maximized the benefits of the peer coaching programme in their study because it allows participants to build a relationship and solve problems with peers at a comfortable pace.

Fourthly, **the context of Chinese VET** should also be taken into consideration when explaining the findings of this dissertation. The context may affect peers' relationship building and teachers' appraisals of feedback, according to previous research and also our findings. The students in Chinese VET schools were found to exhibit more behaviour problems in class than students in general schools (Ren, 2018; Ma, Zhao, Han & Zhao, 2018), which means that VET teachers may need more help with motivating students, managing their classes, adapting their teaching to their students' level and understanding their students. Teachers' special needs in the Chinese VET context have been shown in Chapter 5, in which novice teachers appraised expert feedback from the perspective of using the feedback in their own practice (such as how to adapt expert feedback to VET students' interest and level). Furthermore, the Chinese context may also influence the relationship between peer teachers. For example, in Chapter 4, novice teachers rarely directly refuse feedback from expert teachers. This may be caused by the Chinese culture of respecting senior peers. Similar results were found in a South Korean study, where Butler and Yeum (2016) found that the balance between criticalness and politeness is an important feature of effective feedback, and they argue this is because of the Asian culture of

being polite and courteous.

7.3 Limitations and suggestions for future research

First of all, **the sample size** was a main limitation for some of the studies that involved quantitative analyses. All empirical studies in this dissertation were based on data from one local TPD programme, which did not include many participants. For example, in both Chapter 5 and Chapter 6, we compared the differences between participating teachers who teach different school subjects. However, the groups were not perfectly matched in both of the two studies due to the small number of participants. Thus, in future research, teacher peer feedback should be examined with a larger sample and preferably from different TPD programmes, which may allow researchers to conduct various types of statistics as well as increase the generalisability of the findings.

Secondly, the **effects of peer feedback** were not systemically examined in this dissertation, and the effects found cannot be attributed to the peer feedback alone. Two studies in this dissertation have touched upon the effects of the peer feedback. In Chapter 3, the effects of the programme on participants' teaching efficacy and professional engagement were studied with a pre- and post- control group design. However, the positive effects found in this study could be attributed to the entire programme, because in addition to peer feedback, other learning activities (e.g. lectures) were also included in the programme. In Chapter 4, four types of learning outcomes have been reported by participating teachers, but the learning outcomes were only a subsidiary part of this study. Future studies focusing on the effects of peer feedback could pay attention to comparing the effects of peer feedback-based activities conducted in different settings and contexts.

7.4 Practical implications

Drawing all the findings in the current dissertation together, three main implications could be suggested for school leaders, policymakers and teacher educators who are involved in the field of TPD.

First, **the selection and training of participants** are necessary. As we concluded above, constructive feedback is the main learning resource in a teacher peer feedback activity. This indicates that participating teachers should learn to provide high quality feedback and collectorate with their peers. Thus, we suggest that TPD

programmes involving peer feedback should select and train their participants. The participants recruited in the programme are supposed to have a certain level of teaching expertise and pedagogical knowledge to provide constructive feedback. Moreover, a workshop on how to provide effective feedback and how to work with peers is also highly recommended. This implication has been also acknowledged by previous researchers. For example, Walker, Douglas, and Brewer (2020) argued that with training beforehand on peer interaction, teachers may encounter less uncomfortable situations in providing feedback to their peers and fewer troubles in building relationships with each other.

Secondly, **teachers' needs and concerns** should be taken into consideration when organizing a teacher peer feedback activity. As indicated in Chapter 3 and 5, novice teachers in the Chinese VET context needed pragmatic feedback from expert teachers, such as detailed feedback that can be immediately applied (e.g. specific behaviour principles and general teaching strategies) and feedback on particular issues that novice teachers are concerned about (e.g. student-teacher relationship and classroom management). These findings suggest that future practices of peer feedback should be targeted at what teachers need in a particular stage of their career and at what teachers concern in a particular education context is. Thus, the purposes and content of TPD programme should be designed based on an analysis of participants. For example, survey and interview data from participants should be collected before the programme to decide the learning content and materials.

Thirdly, **teachers' working environment and social status** in the Chinese context should be given more attention, because in the current dissertation, the Chinese VET context seemed to influence the effects of teacher learning through peer feedback (e.g. a low job satisfaction may hinder teachers' improvement of work effort as found in Chapter 3, and novice teachers mentioned their concern of applying feedback in the Chinese VET context frequently as found in Chapter 5). As previously reported in this dissertation, teaching in VET schools in China usually means poorer working conditions and higher workload than working in general secondary schools. Thus, we suggest that policymakers and educational administrators should pay more attention to the work satisfaction of VET teachers, because work satisfaction is found to be one of the most important factors that influence teachers' professional engagement (Fresko, Kfir, & Nasser 1997). Examples of policy strategies could be to increase government expenditures on VET, raise salary for VET teachers, and improve the conditions in VET schools in remote and rural areas.

7.5 Final conclusion

Peer feedback is one of the main components included in many TPD programmes, which should concern the researchers in the teacher learning field. This dissertation particularly contributes to the knowledge of teacher peer feedback. Based on the findings of this dissertation, we can conclude that learning from peer feedback is a complex and long-term process involving sense making and practice adapting, and its' effects are related to many aspects, such as the arrangement of peer feedback activities, perceptions of feedback receivers, and the way feedback is formulated by providers. With regard to the arrangement of peer feedback, the various implementation models and influential factors found in this dissertation indicate the importance of arranging settings of peer feedback activities according to both the goals of the programme and the needs of the participants, which means that the programme should be constantly adjusted. From the perspective of feedback receivers, many practical issues are concerned when they appraise expert feedback. Therefore, to improve teachers' acceptance of feedback, teacher educators and supervisors are supposed to provide more details on how to applied certain feedback in novice teachers' teaching practices. From the perspective of feedback providers, the feedback should be provided in a constructive and positive way, taking into account that the school subjects the feedback provider teaches affect the way feedback is given. This finding has enriched our knowledge of feedback characteristics and emphasizes the importance of matching feedback receivers and providers in future practices of peer feedback. In closing, this dissertation provides an overall understanding of peer feedback in TPD. However, given that many researchers on TPD focus more on the general programmes, instead of feedback itself, there are still many themes in this area that future research can go further into.

References

Achinstein, B., & Davis, E. (2014). The subject of mentoring: Towards a knowledge and practice base for content-focused mentoring of new teachers. *Mentoring & Tutoring: Partnership in Learning*, *22*(2), 104−126.

Alliance for Excellent Education. (2004). Tapping the potential: Retaining and developing high-quality new teachers. Washington, DC: Alliance for Excellent Education. Accessed April 22, 2020. https://all4ed.org/wp-content/uploads/2007/07/TappingThePotential.pdf

Andrews, S. P., Gilbert, L. S., & Martin, E. P. (2007). The first years of teaching: disparities in perceptions of support. *Action in Teacher Education, 28*(4), 4–13.

Artigliere, M., & Baecher, L. (2016). Complexity in Coaching: A Self-study of Roles and Relationships. *International Journal of Evidence Based Coaching and Mentoring, 14*(2), 66.

Attard-Tonna, M., Bjerkholt, E. & Holland, E. (2017). Teacher mentoring and the reflective practitioner approach. *International Journal of Mentoring and Coaching in Education, 6*(3), 210–227.

Bentley, E., Workman, M. & Overby, A. (2017). Being adopted into a teaching community: exploring mentoring relationships in a yearlong field placement. *International Journal of Mentoring and Coaching in Education, 6*(3), 228–241.

Berings, D., De Fruyt, F., & Bouwen, R. (2004). Work values and personality traits as predictors of enterprising and social vocational interests. *Personality and Individual Differences*, *36*(2), 349−364.

Bian, G., & Zhang, M. (2019). 中等职业学校教师流失意愿的调查分析——基于浙江省 276 名中职教师的调查[Investigation of the Turnover Intention of Teachers in Secondary Vocational School: Based on the Data of 276 Teachers from Zhejiang Province]. *职业教育 Vocational Education, 18*(09), 26-32.

Biggs, J. (1996). Enhancing teaching through constructive alignment. *Higher education, 32*(3), 347-364.

Borg, S. (2006). The distinctive characteristics of foreign language teachers. *Language teaching research*, *10* (1), 3–31.

Borko, H. & Livingston, C. 1989. Cognition and improvisation: differences in mathematics instruction by expert and novice teachers. *American Educational Research Journal, 26*(4), 473–498.

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

Briere, D. E., Simonsen, B., Sugai, G., & Myers, D. (2015). Increasing New Teachers' Specific Praise Using a Within-school Consultation Intervention. Journal of Positive Behavior Interventions, 17 (1), 50-60.

Brix, J., P. Grainger, & Hill, A. (2014). Investigating Mandatory Peer Review of Teaching in Schools. *Australian Journal of Teacher Education, 39*(4), 5.

Broad, J. H. (2016). Vocational knowledge in motion: rethinking vocational knowledge through vocational teachers' professional development. *Journal of Vocational Education & Training*, *68*(2), 143-160.

Brock, M. E., & Carter, E. W. (2016). Efficacy of Teachers Training Paraprofessionals to Implement Peer Support Arrangements. *Exceptional Children 82*(3), 354-371.

Butler, Y. G., & Yeum, K. (2016). Dialogic Competence of Primary School English Teachers in Online Peer Coaching: A Case Study in South Korea. *Journal of Asia TEFL, 13*(2), 72.

Cantrell, S. C., Almasi, J. F., Carter, J. C., & Rintamaa, M. (2013). Reading Intervention in Middle and High Schools: Implementation Fidelity, Teacher Efficacy, and Student Achievement. *Reading Psychology, 34*(1), 26-58.

Capizzi, A. M., Wehby, J. H., & Sandmel, K. N. (2010). Enhancing mentoring of teacher candidates through consultative feedback and self-evaluation of instructional delivery. *Teacher Education and Special Education*, *33*(3), 191−212.

Carter, M. & Francis, R. (2001). Mentoring and beginning teachers' workplace learning. *Asia Pacific Journal of Education, 29*(3), 249–262.

CentERdata. (2013). *De toekomstige arbeidsmarkt voor onderwijspersoneel 2013–2025 [The Future of the Labour Market for Educational Staff 2013-2025]*. Tilburg: Tilburg University.

Charteris, J., & Smardon, D. (2016). Professional Learning as 'Diffractive' Practice: Rhizomatic Peer Coaching. *Reflective Practice, 17*(5), 544-556.

Chen, C. & Xu, Z. (2011). 职校教师自我评价及其对职业学校评价的调查 [Survey on the Self-evaluation of Vocational Teachers and Their Evaluation of Vocational Schools]. *中国职业技术教育 Chinese Vocational and Technical Education,* (6), 62-70.

Chi, M. T. (1997). Quantifying qualitative analyses of verbal data: A practical guide. *The Journal of the Learning Sciences*, *6*(3), 271−315.

Chien, C. W. (2017). Elementary School English Teachers' Professional Learning from Teaching Demonstrations as Professional Development. *Cogent Education, 4* (1), 1294229.

Chong, W. H., Klassen, R. M., Huan, V. S., Wong, I., & Kates, A. D. (2010). The Relationships Among School Types, Teacher Efficacy Beliefs, and Academic Climate: Perspective from Asian Middle School. *Journal of Educational Research, 103*(3), 183-190.

Clarke, D. & Hollingsworth, H. (2002). Elaborating a model of teacher professional growth. *Teaching and Teacher Education, 18*(8), 947–967.

Coburn, C. E. (2001). Collective sensemaking about reading: how teachers mediate reading policy in their professional communities. *Educational Evaluation and Policy Analysis, 23*(2), 145–170.

Coburn, C. E. (2005). Shaping teacher sensemaking: school leaders and the enactment of reading policy. *Educational Policy, 19*(3), 476–509.

Cole, A. L. & Knowles, J. G. (1993). Teacher development partnership research: a focus on methods and issues. *American Educational Research Journal, 30*(3), 473–495.

Cui, Y. (2012). 课堂观察 LICC 范式:一种专业的听评课[Class observation in LICC form: a professional class evaluation model]. *教育研究*[*Educational Research*], (5), 79-83.

Davis, B., & Sumara, D. (2014). *Complexity and education: Inquiries into learning, teaching, and research*. New York, NY: Routledge.

Davis, E. A. (2004). Knowledge integration in science teaching: Analysing teachers' knowledge development. *Research in Science Education*, *34*(1), 21−53.

De Bruijn, E. (2012). Teaching in innovative vocational education in the Netherlands. *Teachers and Teaching: Theory and Practice, 18*(6), 637-653.

De Hei, M. S., Sjoer, E., Admiraal, W., & Strijbos, J. W. (2016). Teacher Educators' Design and Implementation of Group Learning Activities. *Educational Studies, 42*(4), 394-409.

Denton, D. W., & Heiney-Smith, J. (2020). Characteristics of an Effective Development Program for Mentors of Preservice Teachers. *Educational Studies, 46*(3), 337-351.

Dewey, J. (1910). *How we think*. Boston: Heath & Co. (Republished as an unabridged replication by Dover Publications, Toronto, in 1997).

Edwards, N. M., & Steed, E. A. (2020). Building Capacity from Within: A Pilot Peer Coaching Project in an Early Childhood Program. Journal of Early Childhood Teacher Education. Online publication, accessed November 12, 2020. https://doi.org/10.1080/10901027.2020.1740842

Elliott, E. M., Isaacs, M. L., & Chugani, C. D. (2010). Promoting self-efficacy in early career teachers: A principal's guide for differentiated mentoring and supervision. *Florida Journal of Educational Administration & Policy*, *4*(1), 131−146.

Fallon, L. M., & Kurtz, K. D. (2019). Coaching Teachers to Implement the Good Behavior Game: A Direct Training Approach. *TEACHING Exceptional Children, 51*(4), 296-304.

Finlay, C., Kinsella, W., & Prendeville, P. (2019). The professional development needs of primary teachers in special classes for children with autism in the republic of Ireland. Professional development in education. Online publication, available from: https://doi.org/10.1080/19415257.2019.1696872 [Accessed 2 May 2020]

Fokkens-Bruinsma, M., & Canrinus, E. T. (2012). Adaptive and Maladaptive Motives for Becoming a Teacher. *Journal of Education for Teaching, 38*(1), 3-19.

Fresko, B., Kfir, D., & Nasser, F. (1997). Predicting Teacher Commitment. *Teaching and Teacher Education, 13*(4), 429-438.

Fuller, F. F. (1969). Concerns of Teachers: A Developmental Conceptualization. *American Educational Research Journal, 6*(2), 207-226.

Gánem-Gutiérrez, G. A., & Gilmore, A. (2018). Expert-novice interaction as the basis for L2 developmental activity: A SCT perspective. *Language and Sociocultural Theory*, *5*(1), 21-45.

Glaser, B. G., Strauss, A. L. & Strutzel, E. (1967). *The discovery of grounded theory; strategies for qualitative research*. Hawthorne, N.Y: Aldine de Gruyter.

Granziera, H., & Perera, H. N. (2019). Relations Among Teachers' Self-efficacy Beliefs, Engagement, and Work Satisfaction: A Social Cognitive View. *Contemporary Educational Psychology, 58*, 75-84.

Grossman, P. L. (1990). *The making of a teacher: teacher knowledge and teacher education.* Columbia: Teachers College Press.

Gu, Y. (2012). 西安市职业教育社会认可度调查[A survey on the social acceptance of vocational education in Xi'an]. *教育与职业[Education and Vocation]*,(25), 52-53.

Guskey, T. R. (1986). Staff development and the process of teacher change. *Educational Researcher, 15*(5), 5–12.

Hairon, S., Loh, S. H., Lim, S. P., Govindani, S. N., Tan, J. K. T., & Tay, E. C. J. (2019). Structured mentoring: Principles for effective mentoring. *Educational Research for Policy and Practice*. Advanced online publication. https://doi.org/10.1007/s10671-019-09251-8

Hattie, J., & Timperley, H. (2007). The Power of Feedback. *Review of Educational Research, 77*(1), 81-112.

Herbert, L. P., Allen, J. M., & McDonald, C. V. (2018). Exploring the influence of multi-field classroom observations on early career teachers' professional practice. *Teaching and Teacher Education: An International Journal of Research and Studies, 73(1),* 192-202.

Herbert, S., & Bragg, L. A. (2020). Factors in a Professional Learning Program to Support a Teacher's Growth in Mathematical Reasoning and Its pedagogy.

Mathematics Education Research Journal. Online publication, accessed November 12, 2020. https://doi.org/10.1007/s13394-020-00310-5

Holland, J. L. (1997). *Making vocational choices: A theory of vocational personalities and work environments.* Odessa, FL: Psychological Assessment Resources.

Huberman, M. (1989). The professional life cycle of teachers. *Teachers college record, 91*(1), 31–57.

Iacono, U. D., Pierri, A. & Taranto, E. (2019). Peer Review Methodology in a Blended Course for Mathematics Teacher Education. *International Journal for Technology in Mathematics Education, 26*(2), 49-54.

Ingersoll, R. M. & Kralik, J. M. (2004). *The impact of mentoring on teacher retention: what the research says*. Denver, CO: The Education Commission of the States.

Ingersoll, R. M. & Smith, T. M. (2003). The wrong solution to the teacher shortage. *Educational Leadership, 60*(8), 30–33.

Ingersoll, R. M. (2001). Teacher turnover and teacher shortages: an organizational analysis. *American Educational Research Journal, 38*(3), 499–534.

Izadinia, M. (2016a). Student teachers' and mentor teachers' perceptions and expectations of a mentoring relationship: Do they match or clash? *Professional Development in Education*, *42*(3), 387−402.

Izadinia, M. (2016b). Preservice teachers' professional identity development and the role of mentor teachers. *International Journal of Mentoring and Coaching in Education, 5*(2), 127–143.

Jao, L. (2013). Peer Coaching as a Model for Professional Development in the Elementary Mathematics Context: Challenges, Needs and Rewards. *Policy Futures in Education, 11*(3), 290-298.

Jin, X., Li, T., Meirink, J., van der Want, A., & Admiraal, W. (2019). Learning from novice–expert interaction in teachers' continuing professional development. Professional Development in Education. Online publication, available from: https://doi.org/10.1080/19415257.2019.1651752 [Accessed 2 May 2020]

Justi, R. & van Driel, J. (2006).The use of the Interconnected Model of Teacher Professional Growth for understanding the development of science teachers' knowledge on models and modelling. *Teaching and Teacher Education, 22*(4), 437–450.

Karagiorgi, Y. (2012). Peer Observation of Teaching: Perceptions and Experiences of Teachers in a Primary School in Cyprus. *Teacher Development, 16*(4), 443-461.

Kilburg, G. M., & Hancock, T. (2006). Addressing sources of collateral damage in four mentoring programs. *Teachers College Record*, *108*(7), 1321.

Kim, K. R., & Seo, E. H. (2018). The Relationship between Teacher Efficacy and Students' Academic Achievement: A Meta-analysis. *Social Behavior and Personality: An International Journal, 46*(4), 529-540.

Koehler, M., & Mishra, P. (2009). What is technological pedagogical content knowledge (TPACK)? *Contemporary Issues in Technology and Teacher Education*, *9*(1), 60−70.

Lee, J. C. K., & Feng, S. (2007). Mentoring support and the professional development of beginning teachers: A Chinese perspective. *Mentoring & Tutoring, 15*(3), 243−262.

Lee, L. (2008). Focus-on-form through collaborative scaffolding in expert-to-novice online interaction. *Language Learning & Technology*, *12*(3), 53-72.

Lewis, C., Perry, R. & Murata, A. (2006). How Should Research Contribute to Instructional Improvement? The Case of Lesson Study. *Educational Researcher, 35*(3), 3-14.

Li, J., & Craig, C. J. (2019). A narrative inquiry into a rural teacher's emotions and identities in China: through a teacher knowledge community lens. *Teachers and Teaching: Theory and Practice, 25*(8), 1−19.

Li, M. & Xu, T. (2018). 回顾与前瞻:职业教育社会认同度问题研究[Review and prospect: A study on the social acceptance of vocational education]. *职教论坛 [Journal of Vocational Education]*, (11), 18-23.

Li, M., & Yang,Y. (2013). 基于双师型教师队伍建设的职教师资培养工作的回顾与思考[An review on the teacher development practice in vocational schools based on the standard of 'double-qualified' teachers]. *职教论坛 Journal of Vocational Education,* (07), 61−66.

Li, R. 2009. 专业化视域里的教师听评课[Lesson study in the professional perspective]. *中国教育学刊*[*Journal of the Chinese Society of Education]*, (8), 87–89.

Li, R., Liu, H., Chen, Y., & Yao, M. (2019). Teacher Engagement and Self-efficacy: The Mediating Role of Continuing Professional Development and Moderating Role of Teaching Experience. *Current Psychology.* Online publication, accessed April 30, 2020. https://doi.org/10.1007/s12144-019-00575-5

Liu, H., Tang Y., & Liu, L. 2010. 中学教师工作满意度及组织承诺与离职倾向的关系研究[A study on the correlation among job satisfaction, organizational commitment and turnover intention of secondary school teachers]. *西南农业大学学报[Journal of Southwest Agricultural University], 8*(1), 265–267.

Löfström, E. & Eisenschmidt, E. (2009). Novice teachers' perspectives on mentoring: The case of the Estonian induction year. *Teaching and teacher education, 25*(5), 681–689.

Louis K. S., & Gordon, M. F. (2006). *Aligning student support with achievement goals: The secondary principal's guide.* Thousands Oaks, CA: Corwin.

Lu, C. (2019).新政策语境下我国职业师范教育的定位与突破——基于职业师范院校的视角[On orientation and breakthrough of vocational normal education in China under new policy context: Based on perspective of vocational normal universities]. 职业技术教育 *Vocational and Technical Education*, *40*(36), 35−40.

Luttenberg, J., Veen, K. V. & Imants, J. (2013). Looking for cohesion: the role of search for meaning in the interaction between teacher and reform. *Research Papers in Education, 28*(3), 289–308.

Lyne, M. J. (2016). Effect of Teacher Mentoring Programme in Malaysia on Improving Teachers' Self-efficacy. *Malaysian Journal of ELT Research, 9*(1), 18.

Ma, L., Zhao, J., Han, N. & Zhao, J. (2018). 中职课堂教学现状调查问卷分析——以保定市为例 [The Analysis of Classroom Teaching in Secondary Vocational Schools - A Case in Baoding]. *新课程研究 New Curriculum Research,* (5), 131-136.

Ma, N., Xin, S. & Du, J. Y. (2018). A Peer Coaching-based Professional Development Approach to Improving the Learning Participation and Learning Design Skills of In-service Teachers. *Journal of Educational Technology & Society, 21*(2), 291-304.

Meerah, T. S. M. & Halim, L. (2011). Improve feedback on teaching and learning at the university through peer group. *Procedia-social and behavioral sciences, 18*, 633–637.

Mena, J., Hennissen, P., & Loughran, J. (2017). Developing pre-service teachers' professional knowledge of teaching: The influence of mentoring. *Teaching and teacher education, 66*, 47-59.

Meyer, H. (2004). Novice and expert teachers' conceptions of learners' prior knowledge. *Science Education, 88*(6), 970–983.

Minghui, L., Lei, H., Xiaomeng, C., & Potměšilc, M. (2018). Teacher Efficacy, Work Engagement, and Social Support Among Chinese Special Education School Teachers. *Frontiers in Psychology, 9*, 648.

Minichiello, V., Aroni, R. & Hays, T. (2008). *In-depth interviewing: principles, techniques, analysis.* Australia: Pearson Australia Group.

Mintz, J. (2019). A Comparative Study of the Impact of Enhanced Input on Inclusion at Pre-service and Induction Phases on the Self-efficacy of Beginning Teachers to Work Effectively with Children with Special Educational Needs. *British Educational Research Journal, 45*(2), 254-274.

Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & Prisma Group. (2009). Preferred Reporting Items for Systematic Reviews and Meta-analyses: The PRISMA Statement. *PLoS med, 6*(7), e1000097.

Mount, M. K., Barrick, M. R., Scullen, S. M., & Rounds, J. (2005). Higher-order dimensions of the big five personality traits and the big six vocational interest types. *Personnel Psychology*, *58*(2), 447−478.

Nami, F., Marandi, S. S. & Sotoudehnama, E. (2016). CALL Teacher Professional Growth through Lesson Study Practice: An Investigation into EFL Teachers' Perceptions. *Computer Assisted Language Learning, 29*(4), 658-682.

Nelson, M. M., & Schunn, C. D. (2009). The nature of feedback: How different types of peer feedback affect writing performance. *Instructional Science*, *37*(4), 375−401.

Oakes, W. P., Lane, K. L., Jenkins, A., & Booker, B. B. (2013). Three-tiered Models of Prevention: Teacher Efficacy and Burnout. *Education and Treatment of Children, 36*(4), 95-126.

O'Brien, P., Goddard, R. & Keeffe, M. (2008). *Burnout confirmed as a viable explanation for beginning teacher attrition*. Paper presented at the Australian Association for Research in Education Annual Conference (AARE 2007). Australian.

Ottley, J. R., Grygas Coogle, C., Rahn, N. L., & Spear, C. F. (2017). Impact of Bug-in-ear Professional Development on Early Childhood Co-teachers' Use of Communication Strategies. Topics in Early Childhood Special Education 36 (4): 218-229.

Ovando, M. N. (1994). Constructive feedback. *International Journal of Educational Management* 8(6):19-22.

Park, K. A., & Johnson, K. R. (2019). Job Satisfaction, Work Engagement, and Turnover Intention of CTE Health Science Teachers. *International Journal for Research in Vocational Education and Training, 6*(3), 224-242.

Parker, M., Ndoye, A. & Imig, S. (2009). Keeping Our Teachers! Investigating Mentoring Practices to Support and Retain Novice Educators. *Mentoring and Tutoring: Partnership in Learning, 17*(4), 329–341.

Pearce, E., de la Fuente, Y., Hartweg, B. & Weinburgh, M. (2019). Peer-coaching as a Component of a Professional Development Model for Biology Teachers. *School Science and Mathematics, 119*(3), 117-126.

Ren, Y. (2018).中职学校活力课堂的构建策略研究——基于课堂教学管理的视角[Research on the construction strategies of dynamic classroom in secondary vocational schools——From the perspective of classroom teaching management].*职业教育研究[Vocational Education Research],* (05), 41-45.

Rivera-McCutchen, R. L., & Panero, N. S. (2014). Low-inference Transcripts in Peer Coaching: A Promising Tool for School Improvement. *International Journal of Mentoring and Coaching in Education, 3*(1), 86-101.

Ronfeldt, M., & McQueen, K. (2017). Does New Teacher Induction Really Improve Retention? *Journal of Teacher Education, 68*(4), 394-410.

Ruan, J., Nie, Y., Hong, J., Monobe, G., Zheng, G., Kambara, H., & You, S. (2015). Cross-cultural Validation of Teachers' Sense of Efficacy Scale in Three Asian Countries: Test of Measurement Invariance. *Journal of Psychoeducational Assessment, 33*(8), 769-779.

Sanetti, L. M. H., Chafouleas, S. M., Fallon, L. M. & Jaffrey, R. (2014). Increasing Teachers' Adherence to a Classwide Intervention through Performance Feedback Provided by a School-based Consultant: A Case Study. *Journal of Educational and Psychological Consultation, 24*(3), 239-260.

Sato, T., & Haegele, J. A. (2018). Physical Educators' Engagement in Online Adapted Physical Education Graduate Professional Development. *Professional Development in Education, 44*(2), 272-286.

Scherer, R., Jansen, M., Nilsen, T., Areepattamannil, S., & Marsh, H. W. (2016). The Quest for Comparability: Studying the Invariance of the Teachers' Sense of Self-Efficacy (TSES) Measure Across Countries. *PloS One, 11(3),* e0150829.

Schmidt, M. & Datnow, A. (2005). Teachers' sense-making about comprehensive school reform: the influence of emotions. *Teaching and Teacher Education, 21*(8), 949–965.

Shao, C. & Zhou, P. (2013). 基于认知学徒制理念的青年教师导师制实践模式[A model of mentoring for young teachers based on modern apprenticeship]. 中国职业技术教育 *Chinese vocational and technical education*, (18), 82–86.

Sherin, M. G. & Han, S. Y. (2004). Teacher learning in the context of a video club. *Teaching and teacher education*, *20* (2), 163–183.

Shields, S. & Murray, M. (2017). Beginning teachers' perceptions of mentors and access to communities of practice. *International Journal of Mentoring and Coaching in Education, 6*(4), 317–331.

Skaalvik, E. M., & Skaalvik, S. (2014). Teacher Self-efficacy and Perceived Autonomy: Relations with Teacher Engagement, Job Satisfaction, and Emotional Exhaustion. *Psychological Reports, 114*(1), 68-77.

Smith, T. M. & Ingersoll, R. M. (2004). What are the effects of induction and mentoring on beginning teacher turnover? *American Educational Research Journal, 41*(3), 681–714.

Sockman, B. R., & Sharma, P. (2008). Struggling toward a transformative model of instruction: It's not so easy!. *Teaching and Teacher Education, 24(4),* 1070-1082.

Somech, A., & Bogler, R. (2002). Antecedents and Consequences of Teacher Organizational and Professional Commitment. *Educational Administration Quarterly, 38*(4), 555-577.

Soslau, E. (2015). Development of a post-lesson observation conferencing protocol: Situated in theory, research, and practice. *Teaching and teacher education*, *49*, 22-35.

Stockard, J. & Lehman, M. B. (2004). Influences on the satisfaction and retention of 1st-year teachers: the importance of effective school management. *Educational Administration, 40*(5), 742–771.

Stokking, K., Leenders, F., De Jong, J. & van Tartwijk, J. (2003). From student to teacher: reducing practice shock and early dropout in the teaching profession. *European Journal of Teacher Education, 26*(3), 329–350.

Stoll, L., & Louis, K. S. (2007). *Professional learning communities: Divergence, depth and dilemmas*. UK: McGraw-Hill Education.

Strauss, A. & Corbin, J. M. (1990). *Basics of qualitative research: grounded theory procedures and techniques.* US: Sage Publications, Inc.

Talbert, B. A. (1992). A review and synthesis of the literature on teacher induction: The vocational education perspective. *Journal of Industrial Teacher Education*, *29*(2), 35−50.

Thijs, A., & van den Berg, E. (2002). Peer Coaching as Part of a Professional Development Program for Science Teachers in Botswana. *International Journal of Educational Development, 22*(1): 55-68.

Thurlings, M., Vermeulen, M., Bastiaens, T., & Stijnen, S. (2012b). Investigating feedback on practice among teachers: coherence of observed and perceived feedback. *Mentoring & tutoring: partnership in learning*, *20*(4), 473–490.

Thurlings, M., Vermeulen, M., Kreijns, K., Bastiaens, T. & Stijnen, S. (2012a). Development of the Teacher Feedback Observation Scheme: Evaluating the Quality of Feedback in Peer Groups. *Journal of Education for Teaching, 38*(2), 193-208.

Tong, X., Cao, H., Jiang, Y., & Wang, J. (2008). 中职教师教学效能感的现状调查及对策研究 [Status Investigation on Teaching Efficiency of Secondary Vocational School Teachers and the Countermeasures]. *职业技术教育 Vocational and Technical Education, 29*(19), 59-60.

Tschannen-Moran, M., & Hoy, A. W. (2001). Teacher Efficacy: Capturing an Elusive Construct. *Teaching and Teacher Education, 17*(7), 783-805.

van Ginkel, G., Oolbekkink, H., Meijer, P. C. & Verloop, N. (2016). Adapting mentoring to individual differences in novice teacher learning: the mentor's viewpoint. *Teachers and Teaching: Theory and Practice, 22*(2): 198–218.

Vattøy, K. D., & Smith, K. (2019). Students' perceptions of teachers' feedback practice in teaching English as a foreign language. *Teaching and Teacher Education, 85,* 260-268.

Veenman, S. (1984). Perceived problems of beginning teachers. *Review of Educational Research, 54*(2): 143–178.

Verloop, N., Van Driel, J., & Meijer, P. (2001). Teacher knowledge and the knowledge base of teaching. *International Journal of Educational Research*, *35*(5), 441−461.

Visone, J. D. (2019). What Teachers Never Have Time to Do: Peer Observation as Professional Learning. Professional Development in Education. Online publication, accessed November 12, 2020. https://doi.org/10.1080/19415257.2019.1694054

Walker, V. L., Douglas, K. H., & Brewer, C. (2020). Teacher-delivered Training to Promote Paraprofessional Implementation of Systematic Instruction. *Teacher Education and Special Education, 43*(3): 257-274.

Wang, F., Clarke, A., & Webb, A. S. (2019). Tailored for China: Did it work? Reflections on an intensive study abroad programme for Chinese student teachers. *Teachers and Teaching: Theory and Practice*, *25*(7), 800−820.

Wang, W. (2016). 职校教师企业实践制度发展十年回顾 [A Review of the Teaching Practice of Vocational School Teachers in the Past Decade]. *河北师范大学学报 Journal of Hebei Normal University, 18*(04):47-53.

Watt, H. M., & Richardson, P. W. (2008). Motivations, Perceptions, and Aspirations Concerning Teaching as a Career for Different Types of Beginning Teachers. *Learning and Instruction, 18*(5), 408-428.

Whalen, C., Majocha, E., & Van Nuland, S. (2019). Novice Teacher Challenges and Promoting Novice Teacher Retention in Canada. *European Journal of Teacher Education, 42*(5), 591-607.

Wijnia, L., Kunst, E. M., van Woerkom, M., & Poell, R. F. (2016). Team learning and its association with the implementation of competence-based education. *Teaching and Teacher Education, 56*, 115-126.

Witterholt, M., Goedhart, M., Suhre, C. & van Streun, A. (2012). The interconnected model of professional growth as a means to assess the development of a mathematics teacher. *Teaching and Teacher Education, 28*(5), 661–674.

Wynn, S. R., Carboni, L. W., & Patall, E. A. (2007). Beginning teachers' perceptions of mentoring, climate, and leadership: Promoting retention through a learning communities perspective. *Leadership and policy in schools*, *6*(3), 209-229.

Xu, G., (2012). 论职业教育中的普通文化课程改革[On the reform of general course in vocational education]. 职教论坛 *Journal of vocational education*, (03), 4–11.

Yang, J. (2013). 职业教育名师工作室建设诌议[The discussion of establishing an expert teacher workshop in vocational education]. *教育与职业[Education and Vocation],* (35), 180–181.

Yang, X., Ran, H., & Zhang, M. (2020). The Shanghai Model: An Innovative Approach to Promote Teacher Professional Development Through Teaching-Research System. *Educational Philosophy and Theory.* Online publication, accessed May 11, 2020. https://doi.org/10.1080/00131857.2020.1794155

Yang, Y., & Zhang, B. (2018). In-Service Mathematics Teachers' Professional Learning in Teaching Research Group: A Case Study from China. In Y. Li, and R. Huang, (Eds.), *How Chinese Acquire and Improve Mathematics Knowledge for Teaching* (pp. 209-223). Leiden: Brill Sense.

Yurekli, B., Isiksal Bostan, M., & Cakiroglu, E. (2020). Sources of Preservice Teachers' Self-efficacy in the Context of a Mathematics Teaching Methods Course. *Journal of Education for Teaching.* Online publication, accessed April 22, 2020. https://doi.org/10.1080/02607476.2020.1777068

Zan, B., & Donegan-Ritter, M. (2014). Reflecting, Coaching and Mentoring to Enhance Teacher–child Interactions in Head Start Classrooms. *Early Childhood Education Journal, 42*(2), 93-104.

Zhang, S., Q. Liu, & Wang, Q. (2017). A Study of Peer Coaching in Teachers' Online Professional Learning Communities. *Universal Access in the Information Society, 16*(2), 337-347.

Zhang, Y. & Ding, Y. (2011). 新手、熟手、专家型职校教师专业发展中职业倦怠实证研究[The job burnout in the professional development of novice, proficient and expert teachers]. *职业教育研究[Vocational Education Research],* (12), 62–64.

Zhao, L. (2010). 专家型职业学校教师的特征及其发展机制[The features and development of expert vocational school teachers]. *职业技术教育[Vocational and Technical Education], 31*(31), 59–62.

Zhao, M. (2018). 从全人教育视角看普职融合课程的价值定位与实现路径[The value and orientation of general-vocational integrated courses from the whole person education perspective]. *教育与职业[Education and Vocation],* (23):89-94.

Zheng, X., Zhang, J., & Wang, W. (2019). Teacher learning as boundary crossing: a case study of Master Teacher Studios in China. *Teachers and teaching, 25* (7), 837–854.

Zhu, M., Liu, Q., Fu, Y., Yang, T., Zhang, X., & Shi, J. (2018). The Relationship between Teacher Self-concept, Teacher Efficacy and Burnout. *Teachers and Teaching: Theory and Practice, 24*(7), 788-801.

Zwart, R. C., Wubbels, T., Bergen, T. C. & Bolhuis, S. (2007). Experienced teacher learning within the context of reciprocal peer coaching. *Teachers and Teaching: Theory and Practice, 13*(2): 165–187.

Zwart, R. C., Wubbels, T., Bergen, T. C. & Bolhuis, S. (2009). Which Characteristics of a Reciprocal Peer Coaching Context Affect Teacher Learning as Perceived by Teachers and Their Students? *Journal of Teacher Education, 60*(3), 243-257.

Zwart, R. C., Wubbels, T., Bolhuis, S., & Bergen, T. C. (2008). Teacher Learning through Reciprocal Peer Coaching: An Analysis of Activity Sequences. *Teaching and Teacher Education, 24*(4), 982-1002.

Summary

Teacher professional development (TPD) programmes are implemented in various forms in different contexts and education sectors, yet despite the different implementation forms, peer feedback seems to be the key component that triggers teachers' change in many of these programmes (Butler & Yeum, 2016; Chien, 2017; Ma, Xin, & Du, 2018; Pearce et al., 2019). This implies that researchers should pay more attention to peer feedback as an essential component of TPD, instead of generally focusing on studying the programmes. Thus, the current dissertation specifically focuses on teacher peer feedback in the Chinese vocational education and training (VET) context, and the main purpose of this dissertation is to provide both an generic framework for the practice of teacher peer feedback and a specific understanding of teacher peer feedback in the Chinese VET context.

Chapter 1: Introduction

In the introduction section, the purpose and context of this dissertation are elaborated, and the research questions and outline of each study are framed.

Peer feedback is usually conducted in many TPD programmes, and it is believed to be an essential component because it provides valuable learning resources and triggers participants' reflection and behavior change (Briere, 2015; Butler & Yeum, 2016; Chien, 2017; Ma, Xin, & Du, 2018; Pearce et al., 2019). However, teacher peer feedback is usually implemented differently according to the context and programme where it is embedded. Thus, previous research is usually focused more on the entire programme, and consideres peer feedback as a subsidiary part. This failed to provide a generic framework for us to understand how peer feedback is implemented in TPD and how teacher peers interact with each other during peer feedback activities. This dissertation specifically focuses on teacher peer feedback and contributes to the knowledge of both the general model of peer feedback and the specific practices of teacher peer feedback.

As to the general part, we defined 'teacher peer feedback' as information shared among teachers regarding aspects of one's teaching performance, teaching plan, and practical issues. With this broad definition, we integrated

different practices of teacher peer feedback. It provided a holistic view of teacher peer feedback and built a framework for the future research and practice. To study the specific practices of teacher peer feedback, we based the empirical studies on the Chinese VET context because vocational school teachers in China may need more support from their peers. Vocational school students in China have been found to have more behaviour problems and lower learning motivation in class than students in general schools, which brings VET teachers more challenges on motivating students, managing their classes, adapting their teaching level, and adjusting their expectations of their students (Ren, 2018; Ma, Zhao, Han & Zhao, 2018). Thus many TPD programmes involving peer feedback were conducted in the context. In the current dissertation, a programme called the Standard Training Programme for Novice Vocational School Teachers in Shanghai (China) was studied. In this programme, peer feedback was implemented in the form of 'novice-expert interaction'. Each participating novice teacher presented their teaching three times (respectively in the form of teaching video, lesson plan, and live classroom teaching), and then a group of expert teachers (n = 2-4) who have a lot of teaching experience (about 10 or more years) had an individual meeting to provide feedback to each of these presenters.

Based on the beyond definition and TPD programme, five studies were designed. The first study in the current dissertation was carried out in the form of a literature review to model the previous practices of peer feedback and provide a general framework for the future studies. The Chapters 3-6 were four empirical studies conducted in the Chinese VET context. The second study focused on the effect of the programme on novice teachers' sense of efficacy and professional engagement. It showed an important role the programme can take in helping novice teachers during their induction phase. In Chapter 4, the cognition and behaviour process of participating teachers during their learning through peer feedback was explored. It provided an in-depth understanding of how peer feedback produce results at the individual level. Chapter 5 focused on participating teachers' appraisals of feedback they received from expert teachers. Their opinions on expert feedback indicated important factors that can influence novices teachers'

acceptance of certain feedback. In the last study, the features of feedback dialogues were examined to figure out how expert teachers provide feedback to their novice peers. The main research questions of the five studies are:

- How is peer feedback implemented in TPD?
- What is the effect of a peer feedback-based TPD programme on novice teachers' sense of efficacy and professional engagement?
- How can novice teachers' learning in novice-expert interaction be characterised in the context of Chinese vocational education?
- How do novice teachers in Chinese vocational education appraise expert feedback in a TPD programme?
- How do expert teachers provide feedback to novice teachers in a TPD programme in the context of Chinese vocational education?

Chapter 2: Implementation models of teacher peer feedback: A systematic review

We conducted our first study of the dissertation in the form of a literature review to generalize the various practices of peer feedback in TPD. We divided the main research question into two specific sub-questions:

- How is peer feedback implemented in TPD programmes?
- Which factors affect the effect of teacher peer feedback in the context of TPD?

To answer the two research questions, we followed the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) standards (Moher et al., 2009) to guide our research procedure. First, the authors searched empirical studies published during 2000-2020 with the term 'peer feedback' and 'teacher' in combination (all synonyms of these two terms, e.g. 'peer evaluation', 'peer review of teaching', 'peer coaching', 'mentor' and 'educator', were also searched). The searching process yielded 3873 results, and after two rounds of screening, 29 articles remained. During the analysis,

the implementation characteristics (e.g. if tools are used, if there are preliminary training on peer feedback, and if a process supervisor is involved) and influential factors of peer feedback were coded and categorized.

With regard to the first research question, four typical implementation models of peer feedback were generated (i.e. lessen study-based peer feedback, research-initiated peer feedback, supervisor-guided peer feedback and self-regulated peer feedback). The dominant characteristics of lesson study-based peer feedback was the iterative work cycle where teachers keep revising their teaching through several rounds of feedback meetings; the research-initiated peer feedback was named after its unique programme context where the teachers peer feedback programme was organized by researchers for study purposes; supervisor-guided peer feedback and self-regulated peer feedback were both defined according to the attendance of a supervisor in the peer feedback activities. The second result showed five factors that influence teacher learning through peer feedback (i.e. characteristics of participants, training and supervision, schedule and duration, support and tools, characteristics of feedback). The characteristics of participants referred to the teaching experience, competences, and learning motivation of participating teachers; training and supervision meant a workshop-style training beforehand or a constant supervision during the process to instruct participants on how to conduct peer feedback; schedule and duration meant the time arrangement during the peer feedback process, such as the duration of the entire programme and the time schedule of meeting; support and tools referred to all kinds of facilities that promote teachers' feedback provision and receiving; characteristics of feedback referred to how feedback was formulated by peers.

The found implementation models provides both a generic framework for future studies and practices of teacher peer feedback and also knowledge about characteristics involved in different types of peer feedback. The second finding indicates the diversity of influential factors in peer feedback, and it emphisises the necessity of designing TPD programmes involving peer feedback according to both the goal of the programmes and the learning needs of participants.

Chapter 3: Effects of a teacher professional development programme in Chinese vocational education on efficacy and professional Engagement of novice teachers

From this chapter on, all the following studies were empirical studies conducted in a comprehensive TPD programme in the Chinese VET context. In this particular study, we examined the effects of the whole programme that embedded teacher peer feedback as one of its learning activities. Teachers' sense of efficacy and professional engagement was regarded as the main indicators of the programme effects because the main goal of this programme was to improve teachers' teaching competencies and retention. Thus two specific research questions were examined:

- What is the effect of the TPD programme on novice teachers' sense of efficacy?
- What is the effect of the TPD programme on novice teachers' professional engagement?

To eliminate the influence of novice teachers' improvement caused by increasing teaching experience, a pre- and post-test control group design was used. Participating novice teachers ($n = 41$) in the TPD programme and non-participating novice teachers ($n = 42$) with a similar background and teaching experience were both surveyed twice, at the beginning and end of the programme. After the data was collected, multivariate analyses of co-variance and paired samples *t*-tests were conducted to compare the change of efficacy and professional engagement between participated and non-participated novice teachers.

Two main results were found: first, the programme had a significant effect on the post-test score of a teacher's self-efficacy on the dimension of student engagement and classroom management, yet the dimension instructional strategies remained unchanged; second, the programme had a significant effect on the post-test score of a teacher's professional engagement on the dimension of planned persistence, yet the dimension of planned efforts remained unchanged.

The possible reasons for the results were discussed. Teachers' change in efficacy may be caused by teachers' different concerns and learning needs. Novice teachers usually concern more about class control, subject matter adequacy, the power structure of the school, and the expectations of principals and parents in their early phase of the teaching career (Fuller, 1969), while instructional strategies are not that important for them at this stage. As to the professional engagement, teachers'

unwillingness of paying effort may be caused by the poor working environments in the Chinese VET context. Chinese VET teachers have a lower salary and higher workload than those in a general secondary school (Bian & Zhang 2019; Chen & Xu, 2011). Thus VET teachers may already put more effort than their counterparts in general secondary schools, and they don't have more energy and time to work even harder. This study concluded that the peer feedback-based TPD programme has a generally positive effect on novice teachers' efficacy and professional engagement. However, the findings only indicate the effect of the entire TPD programme, instead of the peer feedback, because there are other learning activities included in it, for example, lectures on pedagogy.

Chapter 4: Learning from novice–expert interaction in teacher professional development

In Chapter 4, we explored the cognition and behaviour process within novice teachers' learning through peer feedback. The research question is:

- How can novice-teachers' learning in novice–expert interaction be characterised in the context of Chinese vocational education?

The data collection and analysis for this study were mainly based on grounded theory, however, some sensitizing concepts (e.g. teacher change, sense-making, teacher knowledge, and reflective teaching) were present before data analysis due to our prior observation of similar peer feedback-based activities. Qualitative data from four participating teachers were collected. These four novice teachers were all participants in the TPD programme in hand, and they participated in the research voluntarily. Each of the participating teachers needed to have an individual interview with the first author and provide three audio recordings of their feedback sessions with expert teachers (respectively feedback session on teaching video, lesson plan, and live classroom teaching). Thus we collected a total of 16 audio recordings. In the individual interview, teachers were asked to elaborate on every detail about the process that could explain how their cognition and behavior changed after receiving feedback from expert teachers.

Based on three rounds of coding and generalization (open coding, axial coding, and selective coding), three aspects of findings were found: 1) a learning mechanism was constructed to explain novice VET teachers' learning through novice-expert

peer feedback, and it consists of seven steps: comments and advice from expert teachers, acceptance or cognitive differences, reflection, receiving feedback, re-assumption, trial, and learning outcomes; 2) the feedback provided during the programme covered all types of teacher knowledge, namely, general pedagogic knowledge, knowledge of context, subject matter knowledge and pedagogical content knowledge; 3) novice teachers reported four types of learning outcomes, i.e., teaching concepts, teaching competences, general strategies and emotional experience.

The found learning mechanism was interpreted in related to the Interconnected Model of Professional Growth (IMPG, Clarke & Hollingsworth, 2002). This learning model can be understood as an interpretation of the IMPG model for the Chinese VET context. It showed how the external domain (expert feedback) affects the personal domain (novice teachers) and the domain of practice (novice teachers' teaching practice in school). Moreover, the feedback provided by experts and novice teachers' self-reported learning outcome showed that the support from expert teachers is an important external learning resource, which not only provides alternative teaching methods but also encourages and maintains novice teachers' learning.

Chapter 5: Novice teachers' learning from expert feedback: 12 appraisal categories

Feedback receivers' appraisal of feedback was considered in this chapter. It can provide understanding of novice teachers' acceptance of expert feedback. The research question was formulated as:

- How do novice teachers in Chinese vocational education appraise expert feedback in a TPD programme?

Twelve novice teachers who have participated in the peer feedback-based programmed in our context were interviewed about their appraisals of 10 types of feedback content. The 10 types of feedback content were frequently mentioned by expert teachers in the programme, which were categorized based on our prior audio recordings of novice-expert interaction meeting. After the 12 interviews were audio-recorded and transcribed, the data was analyzed through four steps: label the transcribed text, generate and adjust the categories, group categories into domains,

and calculate the frequencies of each domain and category.

Three aspects of results were found: 1) A framework with four appraisal domains (feedback, teacher, VET context and professional development) and 12 specific appraisal categories were built. The domain of feedback showed how novice teachers value expert feedback based on their evaluation of feedback features; the domain of teacher referred to novice teachers' expertise and belief; the domain of VET characteristics referred to the features of both the general system of VET in China and the specific VET school where the novice teacher works; and the domain of professional development indicated how the expectation of novice teachers on their future development may influence their attitude towards different types of feedback from expert teachers. 2) The most referred appraisal categories were found to be 'teachers' expertise', 'students' characteristics' and 'feedback benefit'. 3) Novice teachers teaching the Chinese language tended to apprise expert feedback from the category 'feedback adaptiveness' and 'teachers' belief', while vocational subject teachers concerned more about 'feedback specificity' and 'external pressure'.

The appraisal framework with four domains and 12 specific categories provides a well-structured tool that can be used by future research or practice to evaluate the quality of peer feedback. The results of the most referred appraisal categories reveals teachers' pragmatic demands on peer feedback, because novice teachers frequently reported their expectation of using expert feedback to solve a problem they encountered in their daily teaching by stressing their concern of 'teachers' expertise', 'students' characteristics', and 'feedback benefit'. The last result shows how teachers' needs and the subject they teach may influence their appraisal of certain feedback. For example, teachers in vocational subjects need to transfer expert feedback into concrete steps in their teaching of procedural knowledge, this may urge them to concern mroe about 'feedback specificity'.

Chapter 6: Novice-expert interaction in teacher professional development in China: An analysis of expert feedback

Chapter 6 was focused on the characteristics of feedback dialogues. We divided the main research question in this study into three operational research questions:

- What are the characteristics of feedback that experts provide in novice-expert interactions in the teacher learning context?

- how does expert feedback differ between expert teachers of general subjects and expert teachers of vocational subjects?
- How does expert feedback differ between expert teachers who teach the same subjects as novice teachers and expert teachers who teach different subjects as novice teachers?

Data were also collected in the TPD programme in the Chinese VET context, where expert teachers were invited to observe the novices' teaching and provide feedback. The audio recordings of novice-expert interaction session were used as the research data. Thirty novice teachers were willing to be recorded, and they were in different novice-expert interaction groups. Two groups of general subject teachers (Chinese language and moral education) respectively contained matched and mixed members (in the matched group, novice and expert teachers were teaching the same school subject; in the mixed group, novice and expert teachers were teaching different school subject). Four groups of vocational subject teachers (e.g. traffic and transportation, accounting, and mechanical engineering) were also included, two of them contained matched members, and the other two groups contained mixed members. After the recordings were transcribed, we segmented the expert feedback into dialogues, which in this article means a meaningful unit composed of coherent and continuous talk on a single topic or theme (Chi, 1997). Then the feedback feature framework (Nelson & Schunn, 2009) was used to code the feedback dialogues. According to the feedback feature framework, each feedback dialogue can be composed of eight different features. Thus we calculated the percentages of eight kinds of features in each dialogue. With the percentages of the eight feedback features, we conducted descriptive statistics and an independent *t*-test to compare the differences between feedback dialogues provided by different types of expert teachers.

Four main findings were found: 1) The descriptive statistics of feedback features in all dialogues showed that high percentages of 'problem', 'solution' and 'explanations' were provided in expert feedback. 2) Feedback from general subjects teachers included more features of 'problem' and 'mitigation-compliments' than that from vocational subject teachers. 3) Expert teachers in general subjects provided feedback in diverse and differentiated ways, and vocational subject teachers tended to have similar patterns in providing feedback. 4) Teachers in matched groups provided feedback with more 'problem' and 'praise', while mixed group provided feedback with more features of 'localization'.

These findings indicate that teacher peer feedback in the current study was generally constructive, because expert teachers tended to provide problem-oriented and fact-based feedback with clear instruction on how to improve based on their observation. Moreover, the findings also show that the subjects that expert teachers teach and also the matching between expert and novice teachers affect the way how feedback is formulated in the context of TPD. For example, expert teachers in matched groups may have more confidence and knowledge when providing feedback to novice teachers, so they can include more 'praise' and 'problems' in their dialogues, but expert teachers in mixed groups may be more cautious when providing 'praise' and detecting 'problems' because they can't ensure their comments on the different school subject are definitely correct.

Chapter 7: General discussion and conclusion

In the final chapter, a summary of all the five studies in the current dissertation is provided. We integrated the findings of the five studies, and the limitations and implications of these studies are discussed.

Based on the integrating of the findings, four aspects of contribution of this dissertation are discussed: 1) We systematically studied teacher peer feedback as an essential component of TPD programme. This specific focus underlines the unique value of peer feedback and stressed the necessity of peer feedback in teachers' induction phase; 2) the importance of constructive feedback was stressed, because in many of the studies in the dissertation, expert teachers were found to provided detailed, targeted and timely feedback based on teaching observation to improve novice teachers' teaching practice. This is in line with the definition of constructive feedback (Ovando, 1994) ; 3) According to the complex learning mechanism we found in our studies, peer feedback needed a long time to produce positive effects because teachers need time to build relationship with their peers and to adapt the feedback into their real daily teaching practice. 4) The context of Chinese VET affected teachers' learning through peer feedback. For example, the characteristic of Chinese VET students (e.g. having more behaviour problems than students in general schools; Ma, Zhao, Han & Zhao, 2018) may affect teachers' learning needs (e.g. teachers need more suggestions on how to manage classroom and motivate students).

There are two main limitations to the dissertation. Firstly, all the studies have a small sample size, because all the empirical studies in this dissertations were based

on a local TPD programme that doesn't consist of many participants. This constraints our use of quantitative statistics in some studies. Secondly, the effects of peer feedback were not systemically examined because the effects can hardly be attributed to the peer feedback alone, given that the programme in our dissertation contains other learning activities.

At last, three aspects of practical implication are purposed: 1) As found in some of our studies the peer feedback was regarded by novice teachers as the main learning resources in the programme. This implies that peer feedback activities should recruit teachers with a certain level of teaching expertise, and supervision should be provided to teachers on how to provide feedback to their peers in an acceptable way; 2) Peer feedback-based TPD programme should be more targeted at teachers' needs in the early stages of their career. Therefore, constant surveys and interviews on the participants should be conducted to investigate teachers' needs during the peer feedback activities. 3) The improvement of the environment was found to be a precondition for teachers' work satisfaction and professional engagement. Thus we argue it is necessary to increase government expenditures, improve the school environment, and increase teachers' salary in Chinese VET.

总结

根据教育类型和培训目的不同，教师专业发展项目会呈现出不同的实施模式。但是，不论其实施模式如何变化，同行反馈（如听评课、观课、公开课、说课等）都是其中一个重要组成部分，因为同行反馈对刺激教师教学行为变化具有至关重要的作用 (Butler & Yeum, 2016; Chien, 2017; Ma, Xin, & Du, 2018; Pearce et al., 2019)。这说明当前的研究者应当更加关注于教师同行反馈这一具体学习活动，并将其作为一个独立的研究主题，而不是笼统地聚焦于整个教师专业发展项目。因此，本研究特别聚焦于中国职业教育情境下的教师同行反馈活动，并从不同角度对其进行了研究，加深了对这一教师学习活动的理解。

第 1 章：概述

概述部分详细介绍了本论文的研究目的和研究情境，并呈现了各章节的研究问题和框架。

在很多教师专业发展项目中，同行反馈都被认为是一个重要的学习活动，因为它能够为教师提供学习资源并且刺激教师的反思和行为改变(Briere, 2015; Butler & Yeum, 2016; Chien, 2017; Ma, Xin, & Du, 2018; Pearce et al., 2019)。但是，根据其所在项目的差异，教师同行反馈活动通常存在不同的实践模式。前人研究通常更加倾向于研究教师培训项目这一整体，而仅仅把同行反馈作为其研究中的侧重点。这导致研究者无法构建起一个统一的框架来解释教师在同行互动中的学习。本论文聚焦于教师同行反馈这一具体学习活动本身，对其宏观学习模型及微观实践均进行了研究。

在宏观层面，我们将“教师同行反馈”定义为：教师同行基于某一教师的教学表现、教学计划、实践问题与其共享信息的过程。通过这一定义，我们整合了目前已有教师同行反馈学习活动的实践。这有助于对教师同行反馈这一研究主题提供一个宏观的理解，并为未来研究和实践提供理论框架。其次，在微观层面，本论文选取中国职业技术教育领域作为研究背景，因为同行反馈作为教师学习活动在中国职业技术教育领域十分常见。此外，由于中国职业教育的一些特点，相比普教教师，职校教师似乎更加需要来自同行的帮助。根据前人研究，相比普通教育，职业院校学生通常表现出更多行为问题和更低的学习动机，这对职业院校教师提出了更多挑战。他们必须激励学生的学习兴趣、管理课堂、调整教学难度、调整他们对学生的预期等(Ren, 2018; Ma, Zhao, Han & Zhao, 2018)。因此，本研究对上海市新近中职教师规范化培训项目中的同行反馈活动进行了研究。在该项目中，同行反馈以“新手-专家互动”的模式进行。每个参与活动的新手教师都需要向一组专家教师（通

常 2-4 人）呈现三次他们的教学表现（分别以三种不同形式：视频录课、说课、现场观课）。之后，这组专家教师将和每个进行教学展示的新手教师进行点评会议。

基于以上背景，本论文共设计了五个子研究。第一个子研究（第二章）是文献综述，其目的在于整合前人在教师专业发展项目中对同行反馈活动的实践，并为未来研究提供一个统一的框架。接下来的子研究（第三至第六章）为四个实证研究，均基于中国职业院校教师培训项目开展。第三章聚焦于该培训项目对新手教师教学效能感和专业投入度的影响，它体现了教师培训项目对新手教师职业发展的重要作用。第四章探索了新手教师通过新手-专家互动进行学习时的认知和行为变化。第五章关注于新手教师对专家评课建议的看法，这些看法体现了新手教师在考虑专家建议时的主要影响因素。第六章检验了专家教师的评课意见，探索了这些评课意见的特点。五个子研究的主要研究问题分别如下：

- 同行反馈活动是如何在教师专业发展项目中实施的？
- 包含同行反馈活动的教师专业发展项目对教师的自我效能感和专业投入度有何影响？
- 中国新手职校教师如何通过新手-专家互动进行学习？
- 中国新手职校教师如何看待专家教师给他们的评课意见？
- 中国专家职校教师如何给新手教师提供评课意见？

第 2 章：教师同行反馈的实施模型：一个系统性研究综述

本论文的第一个子研究为综述，目的在于整合前人对教师同行反馈活动的实践。我们将本章的研究问题界定为：

- 同行反馈活动是如何在教师专业发展项目中实施的？
- 哪些因素影响了教师同行反馈在教师专业发展项目中的实施？

为了回答以上两个研究问题，我们根据《系统性研究综述及元分析报告标准（Preferred Reporting Items for Systematic Reviews and Meta-Analysis Standards）》中的规定来实施研究。首先，作者检索了发表于 2000-2020 年间的有关教师同行反馈的实证研究，检索词为“同行反馈+教师”以及两者的所有同义词，比如，“同行评价”“同行评教”“同行训练”；“导师”“教育者”（‘peer evaluation’, ‘peer review of teaching’, ‘peer coaching’; ‘mentor’ ,‘educator’）。检索导出了 3873 条结果，在两轮筛选之后，仅保留 29 篇文章。在分析阶段，作者以实施特点（比如，同行

反馈过程中使用的工具、是否有前期培训、是否有指导人员等）和影响因素作为编码和分类的主要单元。

对于第一个研究问题，经过编码和分类，本研究构建了 4 个典型实施模型（即：课例研究式同行反馈，基于研究的同行反馈，导师指导下的同行反馈，自我管理式同行反馈）。课例研究式同行反馈的主要特点是它包含一个不断重复的循环工作流，教师通常会不断基于上一次的同行评课建议来不断修改他们的教学，并进行多次反复同行反馈；基于研究的同行反馈通常是由研究者组织，基于研究目的进行的，主要用来促进教师对特定教学行为的养成；导师指导下的同行反馈和自我管理式同行反馈的划分依据主要在于活动中是否有专门的指导者。针对第二个研究问题，本研究总结了 5 个影响教师学习结果的因素（即：参与者的特点，训练和指导，时间安排和项目时长，支持和工具，反馈内容特点）。参与者的特点指参加同行反馈的教师的教学经验、胜任力、参与动机等；训练和指导指在开始同行反馈活动前或活动进行中对教师进行指导，使得教师学会用合理的方式给同行提供反馈；时间安排和项目时长指同行反馈活动中的组织安排；支持和工具指在同行反馈活动中所使用的所有支持设备，比如视频、ppt、网络平台等等；反馈内容特点指反馈语言的组织方式，比如反馈是否礼貌、是否直接、是否给与例子、是否有明确的目标等。

本研究中发现的 4 个同行反馈实施模型提供了一个强有力的框架，未来的研究和实践可以使用这个框架来定位培训项目的模型。同时这些实施模型也明确了不同模型的不同的实施特点，可以用来分析其不同培训活动的特点。此外，本研究发现同行反馈活动中存在多种影响教师学习的因素，因此，未来的教师培训项目在设计中应当充分考虑新手教师的学习需求、能力水平、学习动机和期望、项目本身的培养目标，从而开发出最有效的同行反馈活动。

第 3 章：教师专业发展项目对教师教学效能感和专业投入度的影响研究

从第三章开始，后续章节均基于上海市新进中职教师规范化培训项目进行。本章中，研究者检验了该项目在提升新手职校教师教学能力方面的效果。研究选取教学效能感和专业投入度作为教师教学能力的主要衡量指标。研究问题如下：

- 上海市新进中职教师规范化培训项目对新手教师的教学效能感有何影响？
- 上海市新进中职教师规范化培训项目对新手教师的专业投入度有何影响？

为了排除新手教师自然成长带来的影响，本研究采用准实验研究设计，设置了实验组和对照组，并对各组进行了前测和后测。实验组包含 41 名新手职校教师，

均为上海市新进中职教师规范化培训项目的参与者；控制组包含 42 名新手职校教师，均未参与过上海市新进中职教师规范化培训，并且其平均教龄与实验组相似。两组教师均在当年 10 月和次年 6 月各进行一次问卷测试。在收集完问卷之后，将问卷数据录入 SPSS 软件，并对其进行了多元协方差分析和配对样本 *t* 检验。发现了两个主要研究结果：第一，上海市新进中职教师规范化培训对教师的教学效能感量表中“学生投入度”和“课堂管理”两个维度有显著效果，但“教学策略”维度无显著效果；第二，培训项目对教师专业投入度量表中的“持久性（即教师是否愿意在未来继续执教）”维度有显著效果，但“努力度（即教师是否愿意更多地在教学中投入精力）”维度无显著效果。

研究讨论了上述结果的可能原因。首先，教师教学效能感的变化可能受到其学习需求的影响。新手教师在职业初期阶段通常更加关注于课堂管理、学科知识、学校权力结构、校长和及家长的期望等(Fuller, 1969)，但是“教学策略”维度并非新手教师最关注的问题。其次，就专业投入度量表而言，教师培训项目没有提升教师对教学投入精力的意愿。这可能与中国职业教育的环境因素有关。根据前人研究，中国职校教师通常比普教教师承担更多工作负荷，获得更低的工资收入，及更小的晋升机会(Bian & Zhang, 2019; Chen & Xu, 2011)。这表明职校教师可能本来就已经处于努力水平的上限，很难再付出更多的精力和时间了。总体而言，本研究结果说明上海市新进中职教师规范化培训对教师提升教学效能感和专业投入度均有明显效果。但是，值得注意的是，该效果只能归因于整个教师培训项目，而非同行反馈活动，因为该项目除了同行反馈活动还包含了其他类型的教师学习活动。

第 4 章：职校教师在新手-专家互动中的学习机制研究

第 4 章探索了新手教师在上海市新进中职教师规范化培训中通过同行反馈活动进行学习的认知和行为过程。具体研究问题为：

- 在中国职业教育情境下，新手教师如何通过新手-专家互动进行学习？

本研究的数据收集和分析主要采用扎根理论，但是，与扎根理论要求完全基于实证数据进行理论建构有少许出入。我们在数据分析时仍然受到以往研究经历的影响，一些“敏感性概念（sensitizing concepts）”影响了我们的理论构建（比如，教师改变、意义建构、教师知识结构、反思性教学等）。研究中，我们收集了四个新手教师的质性数据。这四名教师均为上海市新进中职教师规范化培训的参与者，且均自愿参与本研究。每位教师均需接受一次访谈（访谈过程被录音），并提交他们

与专家教师的三段评课录音（即说课评课、视频评课、进课堂评课）。因此，我们总共获得 16 段录音。在访谈过程中，新手教师被要求详细描述他们接受和实施专家教师评课意见的过程，以便我们分析其在学习过程中的认知和行为变化。

基于三轮编码和归纳（开放式编码、轴心编码和选择性编码），本研究发现了三方面研究结果：1）构建了一个用于解释新手教师通过新手-专家同行反馈活动进行学习的学习机制。该机制包含了 7 个主要认知和行为步骤，即：专家评课意见、接受或认知冲突、反思、接受反馈、更新假设、尝试、学习结果。2）专家教师在同行反馈中提供的评价建议包含了所有教师知识类型，即：一般教学法知识、情境知识、学科知识和学科教学法知识。3）新手教师报告了四类学习结果，即，教学观念、教学规范、通用策略、情感体验。

在讨论中，结合 Clarke and Hollingsworth（2002）提出的专业成长交互模型（the interconnected model of professional growth, IMPG）对发现的学习机制进行了进一步解释。本研究发现的学习机制可以理解为 IMPG 专业成长模型在中国职业教育情境下的具体化。新手教师在新手-专家同行反馈中的学习机制展现了 IMPG 中“外部领域”（即专家教师和专家评课意见）影响“个人领域”（即新手教师）和“实践领域”（即新手教师的尝试）的具体过程。此外，通过分析专家教师所提出的评课建议和新手教师的学习结果，可以发现专家教师的支持不仅限于提供资源和建议，还包括提供多样化的理解和情感上的支撑，从而激励新手教师维持其长期专业发展。

第 5 章：新手教师对专家反馈的评价：12 个评价类目

本章主要研究新手教师对于专家评课建议的看法。该研究能够帮助我们理解新教师在接受专家反馈时所考虑的主要因素和评价维度。研究问题如下：

- 在中国职业教育情境下，新手教师如何评价来自专家教师的评课建议？

12 位参加了上海市新进中职教师规范化培训的新手职校教师被选为本研究被试。作者对每位被试都进行了结构化访谈。访谈提纲主要由 10 类评课中经常出现的专家建议组成。这 10 类评课建议是从以往的培训项目中归纳得到的。在访谈中，新手教师被要求谈论他们对每一类评课建议的感受，并评价每一类建议对他们的重要性和有效性。在访谈结束后，12 份访谈录音被转录并编码。数据分析过程包括四个主要步骤：标注转录文本，归纳和调整评价类目，评价类目分组，统计不同类

目频次。

基于分析，本研究获得了三方面研究结果：1）根据编码和归纳获得了一个评估框架，用于解释新教师对专家评课意见的评估。该框架包含 4 个评估领域（反馈特点、教师特点、职业教育情境、专业发展）和 12 个评估类目。其中反馈特点指反馈的本身的特点，如具体性和适用性等；教师特点指新手教师的特点，如教学经验和他们所教课程的特点等；职业教育情境指教师所在职业院校的环境或者职校学生的特点；专业发展指由于新手教师对专家评课建议与其个人发展之间关系的看法。2）最常被教师提及的评价类目是“教师教学能力”“学生特点”和“建议的潜在效果”3）同时，语文教师和专业学科教师在评估专家反馈建议时的关注点也有所不同。语文教师更关注于“反馈建议的适用性”和“教师教学信念”；而职业专业学科教师更加关注于“反馈建议的具体性”和“外部压力”。

研究所获得的评估框架为未来的研究和实践提供了一个结构良好的工具，未来的研究者和实践者可以用这一框架来衡量同行反馈学习活动中教师评课建议的质量。第二个研究结果表明新手教师在评价专家反馈建议时抱有一种实用主义倾向。这种倾向表现为新手教师希望能够直接将专家建议运用于他们的教学实践，并切实解决他们在教学实践中遇到的具体问题。这充分体现在访谈中教师频繁谈论他们对“教师教学能力”“学生特点”和“建议的潜在效果”的担心。第三个研究结果说明了不同专业教师对专家评课建议的不同需求。比如，专业课教师期待专家评课建议更加的具体化，因为在技能教学中，职校教师需要将程序性知识具体化，他们更加在意如何通过清晰的方式将某一技能呈现给自己的学生。

第 6 章：教师持续发展中的新手-专家互动：对专家反馈建议的分析

第六章聚焦于专家反馈建议语段的特点。该研究包含三个子研究问题：

- 在新手-专家同行反馈活动中，专家教师所提出的建议有什么特点？
- 公共课专家教师和专业课专家教师所提出的建议有何区别？
- 专家教师与新手教师所教学科相同或不同时，所提出的建议有何区别？

该研究同样基于上海市新进中职教师规范化培训收集数据。研究数据为新手教师和专家教师在同行反馈活动中的对话。一共 30 位新手教师自愿参与了本研究，他们的评课过程均被录音。这些参与者属于不同的新手-专家同行反馈小组，一共包含 6 个小组。2 组是公共课教师（语文和德育），其中 1 组是匹配组（新手教师

和专家教师所教专业相同），1 组为混合组（新手教师和专家教师所教专业不完全匹配）；4 组是专业课教师（交通运输，会计和机械工程），其中 2 组为匹配组，2 组为混合组。在完成评课录音后，30 段录音均被转录为文字。研究者将专家反馈建议划分为不同的语段，每个语段均包含一个意思独立且完整的评课建议主题(Chi, 1997)。接下来，采用 Nelson and Schunn（2009）的反馈特征框架来编码各语段。根据这一框架，每个反馈建议语段均可以包含 8 类不同的特征。因此，研究者可以统计每个语段中 8 类特征出现的百分比，从而分析各语段的特点。在统计各语段中不同特征的百分比后，本研究还采用独立样本 t 检验对比了不同类型专家教师所提供的反馈建议的差异。

基于上述分析，本研究共获得 4 个发现：1）描述性统计分析显示，所有语段中的高频反馈意见特征均包含“问题”“解决方案”和“解释”。2）相比专业课教师，公共课教师所提出的反馈建议包含更多的“问题”和“调节式夸奖”。3）公共课教师所提反馈建议语段的组内差异更明显，各公共课教师反馈建议语段的特征差异较大；而各专业课教师的反馈建议语段特征更加趋同。4）匹配组教师提供的反馈建议中包含更多“问题”和“夸奖”；而混合组教师提供的反馈建议中包含更多“定位”。

以上研究结果表明，本研究中教师同行反馈语段总体表现为具有较强的建设性，因为大多数专家教师都倾向于提供问题导向、基于事实、并且带有清晰指导的反馈建议，从而帮助新手教师提升教学水平。此外，研究结果还说明专家教师所教专业以及专业匹配会影响同行反馈语段的特点。比如，匹配组专家教师可能在提出建议时具有更多本专业知识和更强的信心，因此他们的语段中包含了更多的“夸奖”和“问题”；混合组中的专家教师可能在“夸奖”新手教师和指出“问题”时更加的谨慎，因为他们不能确保自己对其他学科教学的理解是绝对正确的。

第 7 章：结论及讨论

最后一章对五个子研究进行了总结。具体包括对研究结果的整合、对研究局限的反思，对未来实践的启示。

基于本论文中五个实证研究的结果，我们讨论了本论文的四方面主要贡献：1）论文系统性地研究了教师同行反馈，并将其看作教师专业发展项目中的最重要的组成部分之一。这一独特的关注点突出了同行反馈的在新手教师入职培训中的重要价值。2）论文强调了建设性建议（constructive feedback）的重要性，本论文中的多个子研究都发现专家教师倾向于提供具有针对性、具体性、及时性的反馈建议。这

与前人对建设性建议的定义相同(Ovando, 1994)；3）根据论文中发现的复杂学习机制，我们认为同行反馈活动需要较长的时间才能产生实效，因为教师们需要较长的时间来建立稳定的同行互助关系，并且将同行提供的反馈建议融入到自己的日常教学中去。4）最后，论文讨论了中国职业教育情境对教师同行反馈活动的重要影响。其中比较重要的影响是，中国职业院校学生通常比普教学生存在更多的行为问题（Ma, Zhao, Han & Zhao, 2018)，这可能会影响新手教师的学习需求（即新手教师需要同行提供更多关于管理课堂和激励学生方面的建议）。

本论文主要存在两方面局限。首先，五个子研究均为小样本研究，因为这些研究均基于上海市新进中职教师规范化培训这一教师专业发展项目进行。小样本研究导致我们在部分研究中无法使用某些量化统计方法。其次，同行反馈活动的效果没有得到系统性地验证，因为论文所研究的这一教师培训活动还包含同行反馈以外的其他教师学习活动（比如职业教育教学法和教师职业道德等理论课），因此，本研究中关于新手教师学习效果的发现很难完全归因于同行反馈这一具体活动。

最后，论文提出了三方面启示。1）论文发现，教师培训项目中，专家反馈通常都是建设性的，并且新手教师通常将专家反馈建议视为重要的学习资源。这启示未来的教师同行反馈活动应当筛选具备一定资质的参与者，并且给与参与教师指导或培训，帮助参与者理解如何在反馈活动中与同行进行有效地合作。2）同行反馈活动应当更加聚焦于教师在职业早期的学习需求。因此，在同行反馈活动中，应当通过不断调查或访谈参与者来了解他们在教学实践中的现实需求，从而不断优化活动实施方案。3）教师工作环境的改善是教师工作满意度和教师专业投入度的前提条件。该论文强调，只有提高教师工作环境和工作待遇才能保证教师毫无负担地投入到自我发展中。因此，有必要提高对中国职业教育的财政投入，提升学校环境，提高教师待遇等。

Appendices

Appendix A: Questionnaire (Chapter 3)

Hello, dear teachers. In order to study on teachers' perception of this development program. This research is conducted by ICLON Leiden University and CDIBB Tongji University. We sincerely please you to answer this questionnaire. This questionnaire is anonymous and only for research purpose. Thank you very much for your support and cooperation!

1. Are you female or male? ( )
   A. Female B. Male
2. How long have you been teaching? ( )
   A. Less than 1 year B. 1-3 years C.3-5 years D. More than 5 years
3. Which kind of subjects do you teach? ( )
   A. General course B. Vocational specialized course
4. Educational background? ( )
   A. Diploma of secondary vocational school B. Senior college degree
   C. Bachelor D. Master E. Doctorate

The first section

The following questionnaire measures your motivation for studying and your reason of participate this teacher development program. Please indicate how much you agree with the following items:

1. Completely agree; 2. Agree; 3. Undecided; 4. Disagree;
5. Completely disagree

Why do you participate this program? I participated because…

1. Because I'm supposed to do so.	1	2	3	4	5
2. Because I enjoy doing it.	1	2	3	4	5
3. Because it's fun.	1	2	3	4	5
4. Because I would feel guilty if I didn't participate.	1	2	3	4	5
5. Because this represents a meaningful choice to me.	1	2	3	4	5
6. Because I want others to think I'm wise.	1	2	3	4	5
7. I'm satisfied with the novice-expert interaction sessions in this program.	1	2	3	4	5
8. Because I would feel ashamed if I didn't participate.	1	2	3	4	5
9. Because I want others to think I'm a good teacher.	1	2	3	4	5

10. Because I want to learn new things.	1	2	3	4	5
11. Because others (school leaders, colleagues, etc.) oblige me to do so.	1	2	3	4	5
12. I'm satisfied with the lecture part in this program.	1	2	3	4	5
13. Because this is an important work goal to me.	1	2	3	4	5
14. Because I am highly interested in doing this.	1	2	3	4	5
15. Because it is personally important to me.	1	2	3	4	5
16. Because it's an exciting thing to do.	1	2	3	4	5
17. I'm satisfied with this teacher development program in general.	1	2	3	4	5
18. Because that's what others (e.g., school leaders, colleagues) expect me to do.	1	2	3	4	5
19. Because that's something others (school leaders, colleagues, etc.) force me to do.	1	2	3	4	5

The second section

The following questionnaire measures your motivation and feeling with regards to teaching in vocation schools. Please indicate to what extent you feel you can do your work for the following items:

1. Not at all; 2. Very little; 3. Little; 4. Somewhat;
5. Quite a bit; 6. Very much; 7. Always

1. To what extent can you use a variety of assessment strategies?	1	2	3	4	5	6	7
2. To what extent can you help your students value learning?	1	2	3	4	5	6	7
3. To what extent can you respond to defiant students?	1	2	3	4	5	6	7
4. To what extent can you craft good questions for your students?	1	2	3	4	5	6	7
5. To what extent can you help your students think independently?	1	2	3	4	5	6	7
6. To what extent can you establish routines to keep activities running smoothly?	1	2	3	4	5	6	7
7. To what extent can you get through to the most difficult students?	1	2	3	4	5	6	7
8. To what extent can you make your expectation clear about student behavior?	1	2	3	4	5	6	7

9. To what extent can you respond to difficult questions from your students?	1 2 3 4 5 6 7
10. To what extent can you calm a student who is disruptive or noisy?	1 2 3 4 5 6 7
11. To what extent can you implement alternative strategies in your classroom?	1 2 3 4 5 6 7
12. To what extent can you get children to follow classroom rules?	1 2 3 4 5 6 7
13. To what extent can you foster student creativity?	1 2 3 4 5 6 7
14. To what extent can you control disruptive behavior in the classroom?	1 2 3 4 5 6 7
15. To what extent can you provide appropriate challenges for very capable students?	1 2 3 4 5 6 7
16. To what extent can you improve the understanding of a student who is failing?	1 2 3 4 5 6 7
17. To what extent can you provide an alternative explanation or example when students are confused?	1 2 3 4 5 6 7
18. To what extent can you motivate students who show low interest in schoolwork?	1 2 3 4 5 6 7
19. To what extent can you establish a classroom management system with each group of students?	1 2 3 4 5 6 7
20. To what extent can you keep a few problem students from ruining an entire lesson?	1 2 3 4 5 6 7
21. To what extent can you get students to believe they can do well in schoolwork?	1 2 3 4 5 6 7
22. To what extent can you adjust your lessons to the proper level for individual students?	1 2 3 4 5 6 7
23. To what extent can you gauge student comprehension of what you have taught?	1 2 3 4 5 6 7
24. How much effort will you put into your teaching?	1 2 3 4 5 6 7
25. How sure are you that you will stay in the teaching profession?	1 2 3 4 5 6 7
26. How much effort do you plan to exert as a teacher?	1 2 3 4 5 6 7
27. How hard will you strive to be an effective teacher?	1 2 3 4 5 6 7
28. How certain are you that you will remain in teaching?	1 2 3 4 5 6 7
29. How sure are you that you will persist in a teaching career?	1 2 3 4 5 6 7
30. How much will you work at being a good teacher?	1 2 3 4 5 6 7
31. How confident are you that you will stick with teaching?	1 2 3 4 5 6 7

Appendix B: Interview outline (Chapter 4)

Introduction

Thank you for participating in this interview today. I'm Xinglin Jin, the principal investor of this study and also a staff in Tongji University. Through this interview, we want to know how the novice-expert feedback activities may influence your daily teaching. This interview will last around 30 minutes. The information you provided in our interview will be treated confidential and results will always be made anonymous when reported. Our talk in this interview will not affect the assessment in the program. So, please feel free to share your true opinion and experiences.

Now, I'm going to ask your permission to record our conversation. This recording will only be used for research, and if you want to stop recording during our talk for any reason, we can pause it at any time.

Warm up questions

- How are you recently?
- How do you like the novice-expert feedback sessions in the training programme?
- Since the programme have been ended for a while, did you still remember some interesting things happened during the programme?

The main question

Thanks for your sharing. Now we are going to talk about what you have learned and how you have learned during the novice-expert feedback sessions. Please recall the most impressive lesson you learned in the project and describe how you learned it. You may imagine a typical scenario where you are presenting your teaching video, and the expert teachers provide you some feedback. Try to detail the scenario by telling: 1) what kind of feedback you got from the expert teachers; 2) how did you thought about the feedback at that moment; 3) whether you decided to change your teaching according to the feedback; and 4) whether these changes were kept in your daily teaching.

Follow-up questions

- So you just talked about the feedback you get from expert teachers, but then how do you response to the feedback?
- You said you like/dislike the feedback, but why? And did you accept that feedback in the end?

- Since you mentioned that you accepted the feedback, how did you adapt it to your daily teaching? Is there any difficulties when you apply it?
- You said that the feedback didn't work out, then did you try it for more times?
- You mentioned that the feedback work out very well, then do you keep doing that in your daily teaching all the time?
- Is there any other impressive lesson you learned in the conversation with experts beside what we just talked about?

Concluding remarks

Now, that's all my questions. Before we conclude this interview, is there something about the program you want to share, which wasn't mentioned in the questionnaire?

Thank you very much for your sharing, I believe your share will contribute a lot to our study. Later I will transcribe this interview recording, and I will send the text to your e-mail. I would please you to have a look of the transcribed text to ensure there are no misunderstanding in the transcription. Thank you again!

Appendix C: Interview outline (Chapter 5)

Introduction

Thank you for participating in this interview today. I'm Xinglin Jin, the principal investor of this study and also a staff in Tongji University. Through this interview, we want to know your perception about feedback given in the novice-expert meeting in our teacher development program. This interview will only last 20-30 minutes. The information you provided in our interview will be treated confidential and results will always be made anonymous when reported. Our talk in this interview will not affect the assessment in the program. So, please feel free to share your true opinion and experiences.

Now, I'm going to ask your permission to record our conversation. This recording will only be used for research, and if you want to stop recording during our talk for any reason, we can pause it at any time.

Warm up questions

- How do you feel about the novice-expert interaction meeting in our program in general?
- Could you share something about your experiences with the novice-expert meetings that have stayed with you the most?

The main question

Thanks for your sharing. Now let's turn to the main question about your. First, please have a look of the following 10 types of feedback. These are the most frequently provided feedback types in the training programme, and we provided two example for each of the feedback types.

- Could you please indicate that out of the 10 types of feedback, which one do you think is the most important and relevant for you? And why?

Ten types of feedback and examples
1. Provide proper explanation and summary for your students. ● "Give a more precise explanation for students when introducing a new concept." ● "Provide summary at the end of the lesson to emphasis the main point."
2. Assess and evaluate your students. ● "Observe students' reaction in the class and provide feedback."

● "Encourage your students by providing more compliments when assessing their homework."
3. Relate your teaching to students' experience. ● "Use cases that students have experience with." ● "Relate the current lesson to what students' prior knowledge."
4. Arrange the lesson according to the main point of teaching content. ● "Remove irrelevant cases." ● "Relate task and homework to the main point of the lesson."
5. Work on your long-term professional development. ● "Ask support from colleagues when you have a problem in teaching." ● "Improve your knowledge and experience on the subject content."
6. Improve your lesson design. ● "Re-arrange the sequence of your presentation." ● "Prepare intriguing questions in the introduction part of the lesson."
7. Provide proper tasks and homework. ● "Adapt the tasks/homework to your students' level." ● "Provide more clarity about what students have to do for their tasks and homework."
8. Improve the quality of teaching materials. ● "Include the latest concept and information in your teaching materials." ● "Use different forms of teaching material."
9. Engage with your students. ● "Encourage students to present and share work with each other." ● "Include more interactive activities in your teaching to motivate students."
10. Relate your teaching to students' future work situation. ● "Use the authentic task that happens in students' future workplace." ● "Make examples with real cases in the workplace."

Follow-up questions

- So you mean item _____ (feedback type number) is the most important/relevant feedback type for you, but could you please specify the reason why you think it is useful?
- You just explained the reason why you value item _____ (feedback type number) the most, is this also the reason for some other feedback types?

- Is there another impressive feedback type you got from expert teachers during the programme beside what we just talked about?
- Thank you for sharing about how you feel about this issue. I propose to move to the next item first, is that okay? (When they give too many examples or long explanation)
- So we just talked about the most important ones, then how about item _____ (feedback type number) ? (Check all the left items)

Concluding remarks

That is all my questions. I am grateful for interviewing with you today. I think your evaluation of these feedback types proved valuable information for our study. Is there anything about the novice-expert feedback activity that you want to talk about? Thank you very much for your sharing, later after we have transcribed the recording, I will send the text to your e-mail. This interview will only be used for the research, and will not affect your assessment in the program and also will not be shared with the expert teachers, or others. If there is some misunderstanding in the transcription or additional information you want to share, you can contact us any time by sending e-mail to this address: x.jin@iclon.leidenuniv.nl.

Appendix D: Frequencies of appraisal categories in relation to feedback types (Chapter 5)

Appraisal categories	Feedback Types										Total
	Explanation and summarization	Assessment and evaluation	Students' experience	Teaching content	Professional development	Lesson design	Task and homework	Teaching material	Engagement	Students' future vocation	
Feedback benefit	2	4	2	3	0	8	3	1	3	3	29
Feedback frequency	0	0	1	0	0	2	2	1	3	0	9
Feedback specificity	1	0	0	1	1	1	0	0	3	1	8
Feedback adaptiveness	0	0	1	0	0	0	0	0	1	5	7
Teachers' expertise	2	4	6	7	3	6	3	6	6	4	47
Teachers' belief	1	0	3	0	1	0	0	0	2	4	11
Teachers' lessons	0	1	1	1	0	0	1	0	2	3	9
Students' characteristics	1	0	6	2	0	0	12	2	7	6	36
School conditions	0	2	0	0	3	3	0	10	3	1	22
Opportunities and resources	0	0	0	0	9	0	0	0	0	0	9
External pressure	0	0	0	0	5	0	0	0	0	1	6
Personal needs	0	0	0	0	1	0	1	2	0	0	4

Curriculum Vitae

Xinglin Jin was born on 1st August 1990, in Chonqing (China). After graduating from secondary education at Qiujing Secondary School in 2009, he studied Applied Psychology at Chongqing Normal University and obtained his bachelors' degree in 2013. Subsequently, he completed a Master degree of Education in 2016 at Tongji University (Shanghai, China). After obtaining his master degree, he started his work as a research assistant in Tongji University, the Institute of Vocational and Technical Education. In 2017 October, Xinglin started his PhD research at ICLON—Leiden University Graduate School of Teaching, the Netherlands. In his PhD research, Xinglin focused on teacher learning through peer feedback in the Chinese vocational education context.

During his PhD programme, Xinglin attended courses in his research topic provided by the Dutch Interuniversity Centre for Educational Research (ICO). He had published the fourth chapter of the dissertation, i.e., learning from novice–expert interaction in teachers' continuing professional development, in the journal *Professional Development in Education*. All the other four chapters have also been submitted. He has presented his research during the following conferences: ICO National Spring School 2019, ICO International Spring School 2021 and the annual meeting of the American Educational Research Association (AERA) 2021.

Publications

Scientific Publications

Jin, X., Li, T., Meirink, J., van der Want, A., & Admiraal, W. (2019). Learning from novice–expert interaction in teachers' continuing professional development. *Professional Development in Education*, 1-18.

Manuscripts Submitted for Publication

Jin, X., Tigelaar, D., van der Want, A., & Admiraal, W. (submitted). Implementation models of teacher peer feedback: A systematic review.

Jin, X., Tigelaar, D., van der Want, A., & Admiraal, W. (submitted). Effects of a teacher professional development programme in Chinese vocational education on efficacy and professional engagement of novice teachers.

Jin, X., Tigelaar, D., van der Want, A., & Admiraal, W. (submitted). Novice teachers' appraisal of expert feedback in a teacher professional development programme in Chinese vocational education.

Jin, X., Tigelaar, D., van der Want, A., & Admiraal, W. (submitted). Novice-expert interaction in continuous professional learning in China: An analysis of expert feedback.

Presentations

Jin, X., Li, T., Meirink, J., van der Want, A., & Admiraal, W. (2019, March). *Learning from novice-expert interaction in teachers' continuing professional development.* Paper presented at the ICO National Spring School, Amsterdam, the Netherlands.

Jin, X., Tigelaar, D., van der Want, A., & Admiraal, W. (2021, March). *Novice-expert interaction in continuous professional learning in China: An analysis of expert feedback.* Paper presented at the online ICO International Spring School, the Netherlands.

Jin, X., Tigelaar, D., van der Want, A., & Admiraal, W. (2021, March). *Novice Teachers' Appraisal of Expert Feedback in an Induction Program.* Paper presented at the online annual meeting of the American Educational Research Association (AERA), the USA.

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Xinglin Jin
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