Peer feedback in teacher professional development

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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.