Peer feedback in teacher professional development

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Chapter 6

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

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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).

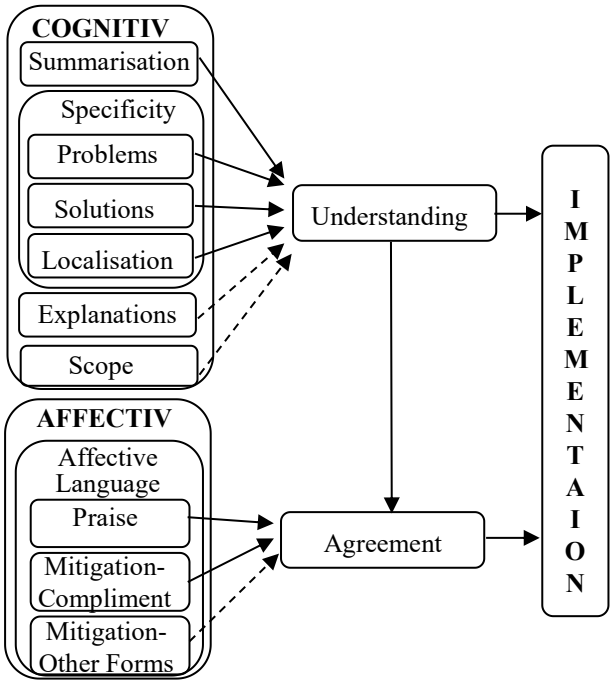

Figure 6.1. The feedback feature model. From Nelson and Schunn (2009). p. 377

'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%	

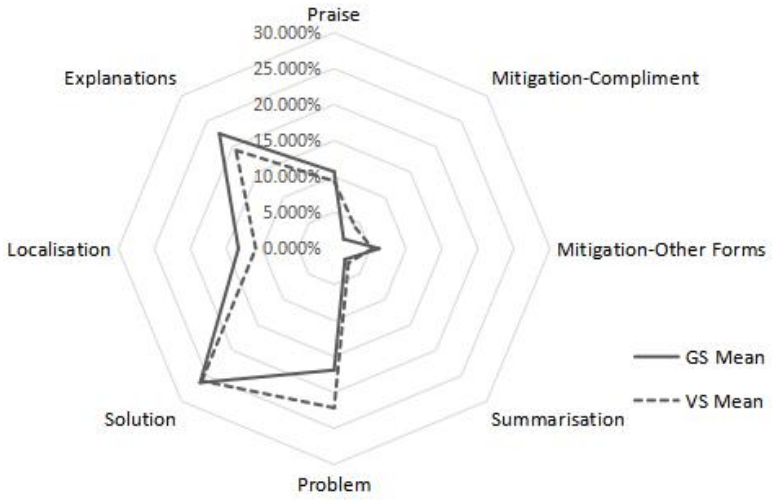

Figure 6.2 Feedback features of general and vocational subject teachers

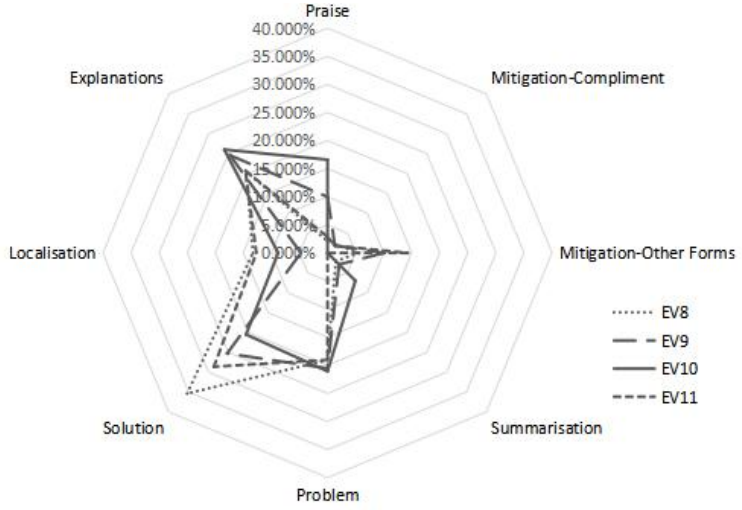

Figure 6.3 Feedback features of four vocational subject

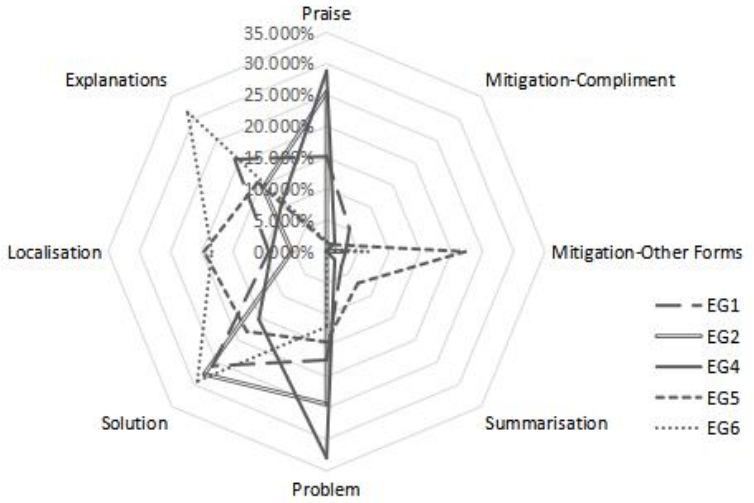

Figure 6.4 Feedback features of five general subject teachers

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%	

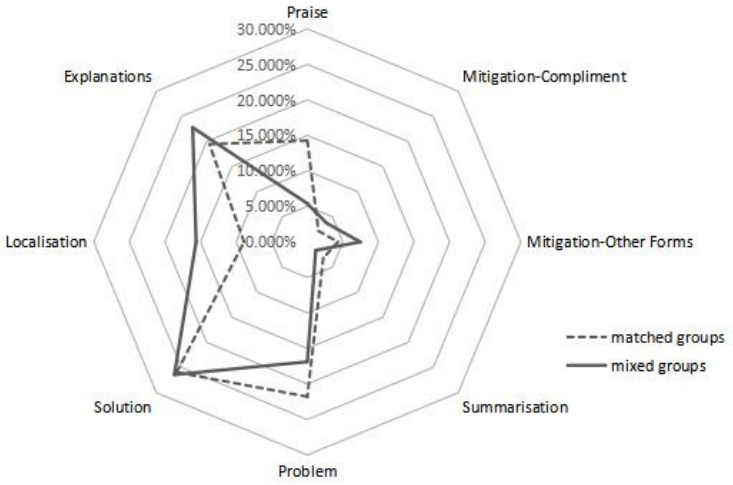

Figure 6.5 Feedback features of teachers in matched and mixed groups

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.