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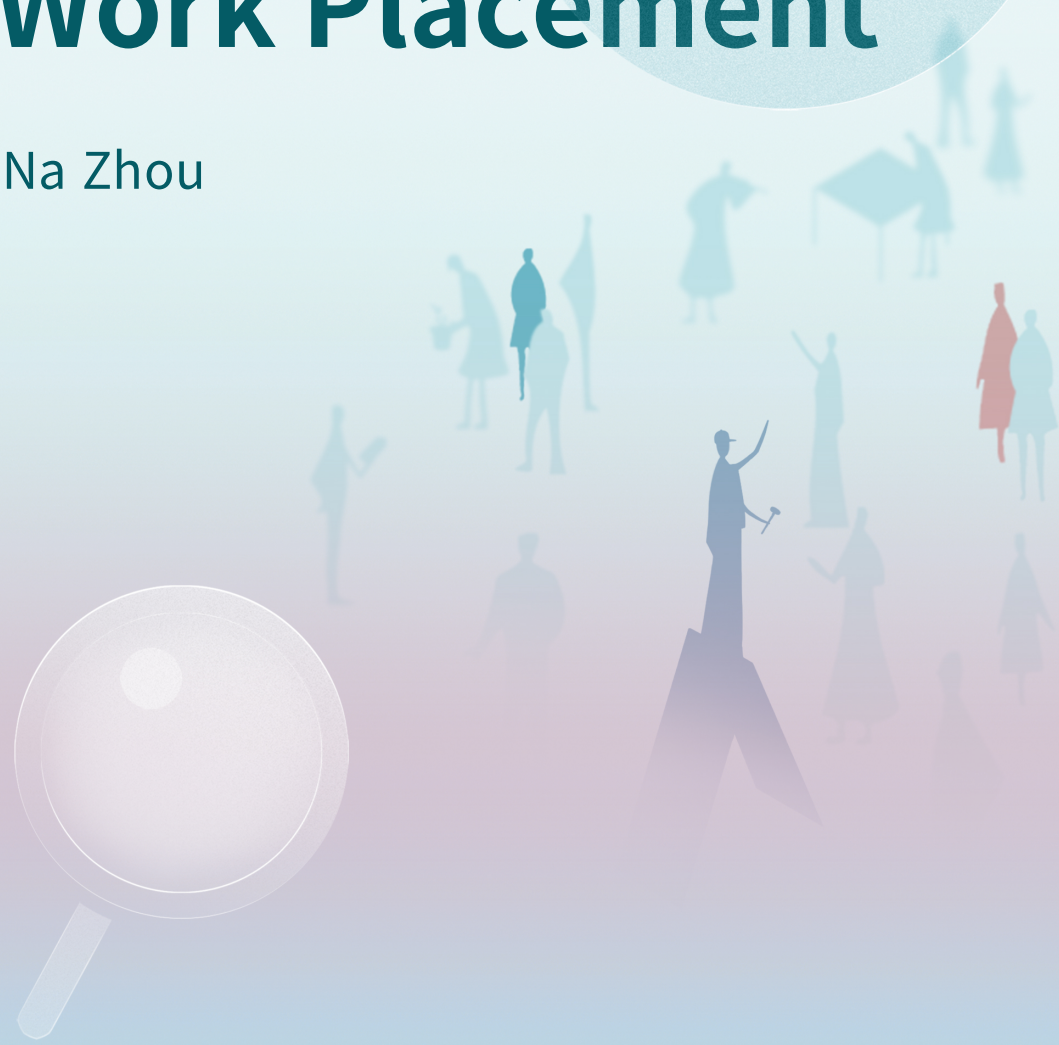

Professional learning of vocational teachers in the context of work placement

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Chapter 1

General introduction

1.1 Introduction

The aim of vocational education is to develop graduates' occupational competence. Aside from workplace learning, school education is also an important source for vocational students to acquire occupational knowledge and skills. In particular, vocational teachers play a crucial role in ensuring the learning achievements of their students. As contemporary industry and society change rapidly, vocational teachers are always expected to seize opportunities to keep updated on their occupational expertise (Andersson & Köpsén, 2019; Lloyd & Payne, 2012; Tyler & Dymock, 2019). To support teachers in this, a series of activities have been proposed, such as stimulating teachers to work part-time in industry, attend industry conferences, and get involved with a professional body (Broad, 2016; Sirk, Liivik, & Loogma, 2016). Among these activities, work placement has become popular and has been implemented in many countries, such as Australia, Sweden, and China, using different labels, like industry release in Australia and extended work placement in France (Lloyd & Payne, 2012; Zaid & Champy-Remoussenard, 2015). Work placement refers to a continuing professional development programme in which vocational teachers retain their occupational expertise through participating in 'the vocational, work-life community of practice of their teaching subject' (Andersson & Köpsén, 2015, p.2). In 2016, the Ministry of Education of the People's Republic of China released a national regulation for work placement, in which all in-service vocational teachers in China are required to attend this programme for at least six months within each five-year period. With the guidance of this regulation, almost all vocational teachers in China have been engaged in work placement.

Although work placement has been implemented nationwide in China, there are a number of obstacles for different actors that hinder the effectiveness of this programme. First, for some of teachers, the unfamiliar surroundings, being different from the school workplace, can result in tensions with regard to their identity as vocational teachers. As a result, teachers may feel confused about how they can be able to learn in work placement and how this learning can support their teaching in school. For example, Zhang and Fang (2016) investigated 604 Chinese vocational teachers from 13 cities and found that in work placement more than 40% of the teachers stood aside as bystanders. Second, for school leaders, although they may have realised that work placement can be beneficial for improving vocational teachers' occupational competence, they are not so clear about how to support teachers' learning

during such programme and stimulate them to apply what they have learnt afterwards in school. For example, Zhang and Song (2021) revealed that vocational schools did not develop a long-term plan for vocational teachers' learning in work placement and also did not set up a department for coordinating work placement programmes. Third, programme designers or industry companies involved in organising work placement, may have no idea of what a desired work placement looks like. This can lead to a lack of scientific management for work placement and a discrepancy with regard to providing learning content that meets teachers' learning needs (Hu, 2020).

In order to gain a better understanding of vocational teachers' learning process in work placement, in the past decade, an increasing amount of research has concerned work placement as one of the most effective professional development programmes for vocational teachers (Andersson & Köpsén, 2015). Some external barriers or facilitators for vocational teachers' participation in this programme have been identified, such as increasing workload and policy stimulation (Lloyd & Payne, 2012; Schmidt, 2019). However, how teachers' learning takes place and how their learning supports their teaching in school is still unclear. In other words, an overview of vocational teachers' professional learning in this programme is still missing (Zaid & Champy-Remoussenard, 2015). Therefore, this dissertation focuses on vocational teachers' professional learning in the context of work placement, which includes teachers' learning motivation, goals, activities, and outcomes about cognition and behaviour. The findings are anticipated to deepen our insights into vocational teachers' professional learning in work placement and to provide useful practical suggestions for developing this programme.

1.2 Context of this dissertation

1.2.1 The system of Chinese vocational education

The Chinese vocational education system consists of both secondary vocational education and higher vocational education, which correspond to level 3 and 5/6/7 with regard to the International Standard Classification of Education (ISCED 2011), respectively. Secondary vocational education mostly contains three years and students usually are aged from 16 years old. And higher vocational education usually comprises a three-year associate degree or a four-year bachelor, which are implemented in vocational colleges and universities for applied science. In contrast

with higher vocational education, secondary vocational education plays a more basic role within the vocational education system. It takes a high responsibility for inducting fresh students from school into workplace occasions. As shown in Figure 1.1, students after graduating from lower secondary school can choose either general upper secondary education or secondary vocational education, and this mainly depends on their scores on the upper secondary school entrance examination. The proportion of students flowing into these two types of education is almost the same. Students after secondary vocational education usually try to find a job or follow higher vocational education.

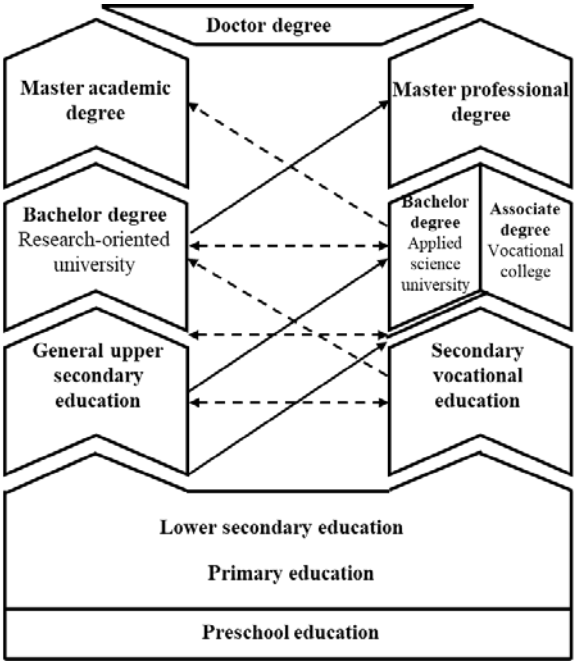

Figure 1.1 An overview of Chinese education system

Adapted from 'Modern vocational education system construction plan' (2014). p.6

In general, Chinese vocational education is typical school-based. Although workplace learning has been integrated into school education recently, it is usually planned in the last year. Thus, school-based learning is still the main way for vocational students to obtain occupational knowledge and skills. The curriculums in school are normally created or designed as syntheses of theoretical and practical modules in which

vocational teachers have to fulfil different roles simultaneously, such as those of lecturer, mentor, and career instructor. In this context, the concept of 'Dual qualified teachers' has been popular in Chinese vocational education, which means that vocational teachers are supposed to keep dual competencies and identities pertaining to 'teaching' and 'work' (The State Council of the People's Republic of China, 2005). Therefore, how to promote vocational teachers' dual competence has become important for improving the quality of vocational education. Compared to pedagogical knowledge and skills, occupational knowledge and skills are more difficult to keep up to date. This is because the former is easier to be acquired and updated based on teachers' teaching work and school-based learning activities, while the latter is usually situated in the world of work. As Andersson and Köpsén (2018) stated, 'The conditions VET teachers face as they seek to develop industry currency are complex as current vocational knowledge is situated in specific work-life practices separated from the practice of school' (p.318).

1.2.2 Work placement in Chinese vocational education

Policy In 1996, the supreme law of Chinese vocational education named 'The Law on Vocational Education of the People's Republic of China' claimed that industrial companies are supposed to provide learning opportunities for vocational teachers. This is the first document that referred to work placement. Then, in 2004, seven central departments including the Ministry of Education of the People's Republic of China jointly published 'Some suggestions on developing work on vocational education', which addressed the importance of engaging in industry workplace for vocational teachers and firstly initiated a general regulation for conducting work placement. In 2006, the Ministry of Education of the People's Republic of China released 'Some suggestions on the implementation of the regulation for work placement of secondary vocational teachers' which indicated that novice vocational teachers have to undertake work placement for at least three months before teaching. After that, in 2011, the Ministry of Education of the People's Republic of China published 'Some suggestions on promoting vocational teachers' education and training', in which it pointed out that vocational teachers have to conduct work placement for at least two months within every two years. This regulation was adapted into 'six months within each five-year period' in the 'Regulation for work placement of vocational teachers' which was published in 2016 by seven central departments and

‘one month annually’ in ‘The implementation plan of national vocational education reform’ which was published in 2019 by the State Council of the People’s Republic of China. Recently, in 2021, in the document ‘The action for developing the competence of vocational teachers’ enacted by the Ministry of Education of the People's Republic of China, it was noted that the current places and settings for national work placement need to be enriched and vocational teachers ought to attend work placement for at least one month annually.

Implementation With the guidance of the Chinese government, work placement has been implemented nationwide. Mostly vocational teachers undertake their work placement during summer or winter breaks, which is due to the lack of teachers who can take over their teaching work. Vocational teachers usually have three ways to look for an appropriate company or association for work placement. First, they could seek by themselves through social media or their network, such as going to friends’ companies. Second, they could agree to the arrangement of their school, which often has some cooperation with a few companies. Third, they could also register in national or municipal projects of work placement, which can provide them with company options, such as ‘National projects of work placement for vocational teachers’ and ‘Shanghai work placement project of secondary vocational teachers’. Although vocational teachers are not able to get salaries from companies, they can get subsidies for transportation or meals from their school or the government. Although vocational teachers are assigned to a certain post, most of them cannot be fully qualified because of their limited occupational experience. During work placement, vocational teachers are usually faced with various opportunities to learn, and these learning opportunities can be quite different within and across companies and occupations.

1.3 Conceptual framework

To shape vocational teachers’ professional learning in the context of work placement, we applied four types of theories which concerned different research questions. Concretely, firstly, a motivational theory called ‘expectancy-value theory’ (Eccles et al., 1983) was used as a framework to understand vocational teachers’ motivational beliefs for work placement. Secondly, the prior models of workplace learning activities were employed to characterise vocational teachers’ learning approaches in work placement. Thirdly, a model of teacher learning outcomes from Harland and

Kinder (2014) was utilised to investigate vocational teachers learning outcomes from work placement. Fourthly, the previous frameworks on the transfer of learning were drawn upon to probe into factors predicting vocational teachers' learning transfer from work placement to school. We will explain each of them below.

1.3.1 Teacher learning motivation: Expectancy-value theory

Apart from external factors, teachers' motivation for professional learning is employed as another vital predictor of their engagement or achievements. Among all kinds of theoretical perspectives, the expectancy-value theory has been widely adopted to outline the motivational beliefs of adults, including teachers. It indicates that an individual's choice, persistence, and achievement can be understood by a person's expectancy for success and task value. The expectancy component addresses how well individuals believe they can do on upcoming tasks, while the task value component means how valuable they consider those tasks to be.

Specifically, the expectancy for success can be defined as a personal or efficacy expectation. Eccles et al. (1983) showed in their model that an individual's perception of competence is highly influenced by his or her expectancy belief. Furthermore, a substantial amount of literature does not distinguish between ability belief, i.e., appraisal of one's ability to master a task and expectancy for success. Therefore, more and more scholars have utilised ability beliefs (self-efficacy) to represent the expectancy for success. For example, Bergey, Parrila, and Deacon (2018) measured students' academic self-efficacy as an expectancy variable. Task value can be defined as how a task meets individuals' needs. Eccles et al. (1983) proposed multiple components, including attainment value, intrinsic value, utility value and cost. Attainment value means the importance of doing well on a task, intrinsic value refers to the enjoyment gained from doing a task, utility value refers to the usefulness of doing a task, and cost refers to what the individual gives up to do a task. In recent years, the cost was preferred to be separated from task value by researchers (Jiang, Rosenzweig, & Gaspard, 2018; Kosovich et al., 2015).

1.3.2 Workplace learning activities

Work placement entails a special professional development programme in which vocational teachers' learning deviates from both teachers' learning in school workplace and professionals' learning in an industrial workplace. Still, theoretical

models and empirical findings from teachers' learning in the school workplace and professionals' learning in an industrial workplace could provide useful insights to understand vocational teachers' learning in work placement.

In general, teachers' professional learning can be formal and informal, and it can occur in different contexts. Concretely, formal learning often takes the form of professional development activities that are organised by the school, by scholars, or by the government and can be organised both inside and outside school. Informal learning mainly occurs within the school workplace. Compared to formal learning, informal learning is more connected to teachers' routine work and is more commonly experienced as engaging. Meirink, Meijer, and Verloop (2007) reviewed previous studies and generated five categories of teachers' learning activities in the school workplace: 1) learning from doing, 2) learning from experimenting, 3) learning from reflecting, 4) learning from others with interaction, and 5) learning from others without interaction. Similarly, learning activities carried out by professionals as learners within an industrial workplace can be also formal and informal. Formal learning within an industrial workplace is usually situated in a professional training setting, provided by employers. Informal learning within industrial workplaces can be considered as work-based learning. Nikolova et al. (2014) classified work-based learning activities into four categories, i.e., learning through reflection, learning through experimentation, learning from colleagues, and learning from supervisors.

1.3.3 Teacher learning outcomes: A model of learning outcomes

Learning outcomes of teachers refer to the changes in their cognition or behaviour which result from participating in various kinds of learning activities (Hoekstra et al., 2009). A well-known assumption is that teachers' changes in behaviour often follow changes in their cognition (Harland & Kinder, 2014; Opfer, 2016). The model of Harland and Kinder (2014) was constructed in the context of continuing professional development for teachers, or in-service education and training settings (INSET). Harland and Kinder (2014) distinguish nine types of learning outcomes: (a) material and provisionary outcomes—physical resources teachers get from INSET; (b) informational outcomes—facts and news relevant to the curriculum, management and implications for practice; (c) new awareness—teachers' perceptual or conceptual shifts; (d) value congruence outcomes—teachers' personalised perspectives which are in line with INSET designers' views of 'good practice'; (e) affective outcomes—

emotional changes during INSET situation; (f) motivational and attitudinal outcomes—teachers' motivation to apply the ideas obtained from INSET; (g) knowledge and skills—teachers' deeper understanding related to teaching content; (h) institutional outcomes—collective effect on teacher groups; and (i) impact on practice—intentional changes in practice. Harland and Kinder (2014) also proposed a hierarchy among these types of outcomes, as shown in Table 1.1. In their model, the impact on practice is deemed the ultimate outcome with respect to behaviour, which can be obtained directly or through indirect paths influenced by the other outcomes.

Table 1.1 A sequence of INSET outcomes.

INSET input			
3rd order	Provisionary	Information	New awareness
2nd order	Motivation	Affective	Institutional
1st order	Value congruence		Knowledge and skills
Impact on practice			

1.3.4 Transfer of learning

Transfer of learning is defined as 'the effective (generalisation) and continuing (maintenance) application in the job environment of the skills, knowledge and conceptions gained in a staff development context' (De Rijdt et al., 2013, p.49). A few influencing factors of learning transfer have been identified in previous work. For instance, Baldwin and Ford (1988) divided the factors affecting the transfer of training into three categories: 1) training-input factors, including trainee characteristics, training design, and work environment; 2) training-output factors, consisting of learning and retention; 3) conditions of transfer. Lim and Johnson (2002) identified two main dimensions: 1) individual characteristics, which include motivation toward transfer and level of technical competence; 2) work environment, which can be classified into the individual level and organisational level work environment. Subedi (2004) conclusively showed that the factors influencing transfer can be classified as trainee characteristics, training design and delivery characteristics, and organisational or workplace environment characteristics.

In the field of education, De Rijdt et al. (2013) identified many influencing and moderating factors in the transfer of learning via literature review. The influencing

variables are divided into three constructs, including learner characteristics, intervention design, and work environment, which were in line with most previous literature. This model could be a general framework to understand teachers' transfer of learning.

1.4 Outline of this Dissertation

This dissertation aims to provide insight into vocational teachers' professional learning in work placement, which consists of learning motivation, activities, goals, outcomes, and factors predicting the transfer of learning. As shown in Table 1.2, to better understand vocational teachers' learning in work placement, the first study focuses on investigating vocational teachers' learning activities and outcomes in all various contexts with a systematic literature review (Chapter 2). A total of 54 related studies published from 2010 to 2020 were analysed. The learning context was analysed to distinguish vocational teachers' learning activities, while the model of learning outcomes developed by Harland and Kinder (2014) was used to frame vocational teachers' learning outcomes.

After a general exploration of vocational teachers' professional learning, we moved our target to their professional learning in a specific programme referring to work placement. Since vocational teachers' learning process in work placement has been under-investigated, we believe that a deep and comprehensive exploration is needed. Therefore, the second study (Chapter 3) is aimed at exploring the relationship between vocational teachers' motivational beliefs and their engagement in the context of work placement. The teaching experience was also examined as a moderating factor. A large-scale sample of 456 secondary vocational teachers answered the questionnaire.

In the third study (Chapter 4), vocational teachers' learning activities, goals, and outcomes in work placement are probed from a qualitative perspective. We invited 27 secondary vocational teachers to participate in our interview after completing their work placement. In this interview, they were asked to talk about their learning experience during work placement and their intention on how to make use of that learning experience.

To further understand vocational teachers' benefits from work placement, a longitudinal observation seemed necessary. We thus investigated the impact of work placement on vocational teachers' teaching and other practices in school within a longer period (Study4, Chapter 5). Of the 27 participants in the third study, 18

participated in the following interview after completing work placement for around a semester. We strived to ask them to report the real changes in their school practice resulting from work placement for the past semester. A part of the data linked to vocational teachers' intentions to change from Chapter 4 was integrated into this study, which could reveal more insights into both vocational teachers' intentional and actual changes in their school practice after work placement. Moreover, the factors influencing vocational teachers' changes in their school practice were also captured based on vocational teachers' experience. Although vocational teachers' changes and influencing factors were captured, they were obtained from a small-scale group.

To provide further evidence, we employed a quantitative way to examine vocational teachers' changes in school practice and their predicting factors which were generated from the fourth study (Study5, Chapter 6). Data was collected using a questionnaire which was answered by 372 participants.

Finally, in chapter 7, we report the main conclusions from each study, and then we discuss the general findings and the implications of this dissertation.

Table 1.2 Schematic overview of the studies

Chapter	Research focus	Research type	Measurement instruments	Participants	Time of data collection
2	Vocational teachers' professional learning activities and outcomes in all various of contexts	Systematic literature review	N/A	N/A	January 2010-August 2021
3	Relationship between vocational teachers' motivational beliefs and engagement in work placement	Quantitative	Questionnaire	426 secondary vocational teachers	February-March 2020
4	Vocational teachers' learning activities, goals, and outcomes in work placement	Qualitative	Interview Digital profile	27 secondary vocational teachers	August-September 2020
5	Impact of work placement on vocational teachers' school practice and factors that influence its impact	Longitudinal ; Qualitative	Interview	18 secondary vocational teachers	January 2021
6	Factors predicting vocational teachers' transfer of learning from work placement to school	Quantitative	Questionnaire	372 secondary vocational teachers	March 2022

Chapter 2

Vocational teachers’ professional learning: A systematic literature review of the past decade

This chapter is an adapted version of
Zhou, N., Tigelaar, D. E., & Admiraal, W. (2022). Vocational teachers' professional learning: A systematic literature review of the past decade. *Teaching and Teacher Education*, 119, 103856. https://doi.org/10.1016/j.tate.2022.103856

Abstract

In the last decade, how to promote in-service vocational teachers' capabilities has become one of the most important concerns in the field of vocational education. This study presents the results from a systematic review of vocational teachers' learning activities and outcomes, based on an analysis of 54 journal articles published between 2010 and 2021. These results illuminate that, first, vocational teachers' learning can occur in academia, school workplace, and industry settings, and in various formal and informal ways. Second, vocational teachers' learning outcomes are related to the changes in their cognition and behaviour as well as student and institutional benefits.

2.1 Introduction

Vocational teachers play a crucial role in ensuring vocational graduates' competitiveness in the labour market. To raise the quality of vocational education, vocational teachers are expected to seize opportunities to develop themselves, both inside and outside school (Dymock & Tyler, 2018; Schmidt, 2019; Virkkula & Nissilä, 2014). In recent years, the professional learning of vocational teachers has obtained much attention as contemporary society and industry are changing rapidly, which means vocational teachers have to adapt their teaching practice to the newest developments (Andersson & Köpsén, 2018; Hoekstra & Newton, 2017). In order to support vocational teachers to deal with these ongoing changes, a variety of professional learning initiatives or activities have been employed. Moreover, a substantial number of innovations or reforms have been implemented in the field of vocational education, which alters the competence requirements of vocational teachers and hence stimulates them to keep up with professional learning. For example, in the Netherlands 'competence-based education' was introduced, i.e., an educational innovation that entails curricula in vocational education should be derived from an analysis of the actual roles of professionals in society. To realise it, vocational teachers across different disciplines are advocated to work jointly and engage in team learning (van Griethuijsen et al., 2019; Wijnia et al., 2016).

Vocational teachers' work is based on dual professionalism and they are expected to keep their competencies of both teacher and professional up to date (Andersson & Köpsén, 2015; Fejes & Köpsén, 2014; Köpsén & Andersson, 2017; Virkkula & Nissilä, 2014). As Lloyd and Payne (2012) explained in their research, '*For those teaching vocational programmes, there are 'dual' skill needs which require them to keep up to date with their particular craft or trade, while also developing the pedagogic skills needed to impart this knowledge to learners.*' (p.2) This dual focus has been a common guide to implement pre-service or in-service vocational teacher learning activities in most countries. For example, in Germany, aside from vocational teacher training, vocational student teachers have to conduct subject-related internships, work, or other practical activities for at least 12 months before starting their teaching career (der Länder, 2018). In China, a country with a typical school-based vocational education system, the concept of 'dual qualified teachers' has been developed, which implies that vocational teachers are supposed to possess both theory-based and work-based teaching abilities (The State Council of the People's Republic of China, 2005). In

addition to regular professional development, all vocational teachers are required to engage in the industry context for at least one month every year (The State Council of the People's Republic of China, 2019).

In the past decade, an increasing number of studies have strived to characterise vocational teachers' professional learning. Some studies mixed vocational teachers with general teachers, while other studies only explored vocational teachers. Based on these studies, four main topics can be distinguished: learning needs, antecedents, activities, and outcomes (Hoekstra, Kuntz, & Newton, 2018; Serafini, 2018). More than learning needs and antecedents, learning activities and outcomes are the heart of understanding learning processes. They provide an overview of what vocational teachers do and with which results when developing professionally. Yet these findings are scattered over various studies and many of those only cover one particular activity or outcome. Until now, a comprehensive overview is still missing. Therefore, in this study, we aim to synthesise vocational teachers' learning activities and outcomes. Two questions directed our research:

RQ1. How can vocational teachers' professional learning activities be characterised?

RQ2. What outcomes of vocational teachers' professional learning can be distinguished?

2.2 Method

2.2.1 Literature search

In this study, we followed the principle of the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analysis) 2020 statement and explanation and elaboration (Page et al., 2021). The literature search was performed across all electronic databases with the number of 779 available at the Library of Leiden University, such as the Web of Science, Educational Resources Information Center (ERIC), and Social Science Research Network (SSRN). We employed the following search terms combined with Boolean operators: Title included professional development OR professional learning OR teacher training OR teacher learning AND Any field included vocational teachers OR VET teachers. The literature search was restricted to the period from Jan 2010 to August 2021 because of two reasons. First, a body of research on vocational teachers' professional learning has emerged since 2010.

Second, new developments in society and vocational education, including vocational teachers' professionalisation occurred from 2010, which was already predicted by Béduwé et al. (2009). To ensure the quality of our study, only journal articles were selected that were peer-reviewed, which means there was no grey literature included. This search resulted in 1307 hits.

2.2.2 Literature screen and selection

As shown in Figure 2.1, after removing 15 duplicates, we screened the titles and abstracts of the remaining 1292 articles based on the following initial inclusion criteria: 1) Participants in the studies are in-service vocational teachers, i.e., either teachers in vocational schools or vocational teachers in general schools. 2) The topic of the studies is professional learning. Drawing upon these criteria, 53 articles were included and 904 articles were excluded. However, a barrier appearing in the process of screening was that a number of studies did not explicitly describe the participants in their abstracts. Therefore, 335 articles were further scrutinized by screening the methods sections of the full texts. As a result, 42 articles were added for eligibility assessment.

To evaluate the eligibility of the selected 95 articles, two more specific criteria were employed in our study. First, the included research had to be focused on vocational teachers' professional learning with consideration of either learning activities or outcomes, or both. Second, we excluded the studies with vocational teachers and other types of teachers as participants that did not present findings for vocational teachers separately. After this step, 41 articles were excluded and 54 articles were included in further analysis.

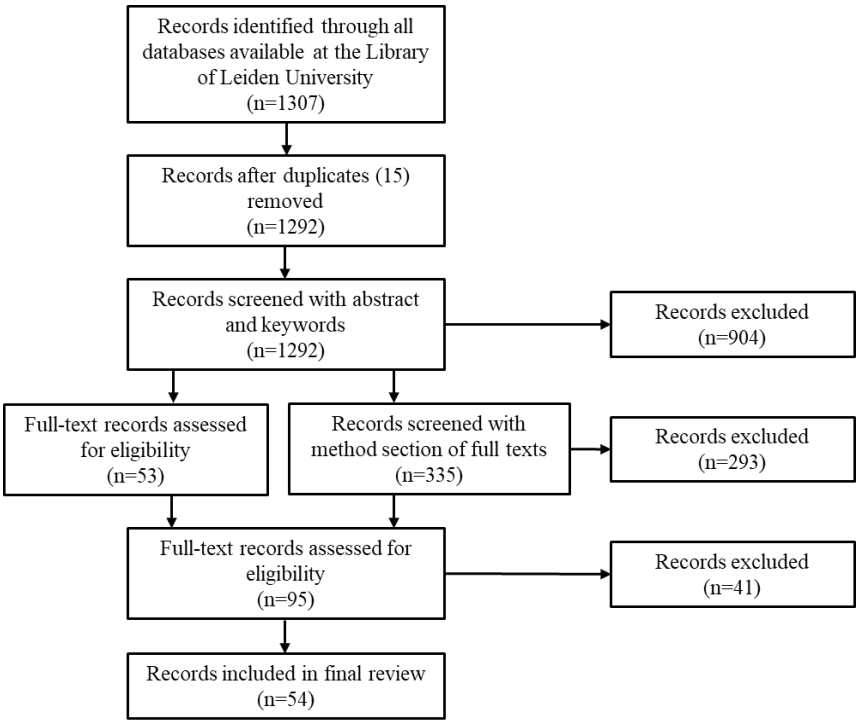

Figure 2.1 Flowchart of the article search and selection

2.2.3 Literature coding and analysis

In order to analyse the full texts of the selected literature, we first selected the fragments linked to vocational teachers' professional learning activities and outcomes. Learning activities and learning outcomes have been described in 54 articles and 37 articles, respectively. Three categories of learning activities have been generally distinguished: pre-defined professional development programmes, school-based learning, and industry-based learning, which focus on formal learning in programmes, informal learning in the school workplace, and formal and informal learning in the industrial workplace, respectively. Although informal learning outside school and industry, such as informal online learning has been indicated as an emerging learning approach (Macià & García, 2016), we only found two studies that reported this kind of learning, consisting of 'accessing materials, resources, or communities online' (Broad, 2016) and 'watching online presentations' (Hoekstra, Kuntz, & Newton,

2018). Although these two activities were conducted in a virtual context, they can be deemed as an updated form of self-directed or collaborative learning in the workplace. Therefore, we moved them to the category of school-based learning. Furthermore, as collaborative learning has been a particularly important component of school-based learning (Oude Groote Beverborg et al., 2015), we then split school-based learning into self-directed/initiated and collaborative learning, which means four categories of learning activities were finally generated. The descriptions for coding categories were listed in Table 2.1.

Table 2.1 The coding categories of learning activities

Learning activities	**Descriptions**	**Examples**
Pre-defined professional development programme	Learning activities which are well-designed and organised inside or outside school (excluding industry).	Academic course, Formal education, Academic workshops.
Self-directed/initiated activities in school	Learning activities in which vocational teachers have ownership over their learning process in school.	Learning from doing, Learning from reflection, Learning from reading.
Collaborative activities in school	Learning activities which need interactions or cooperation with colleagues, supervisors, or students in school.	Peer sharing, Peer observation, Asking for feedback from students.
Industry-based activities	Learning activities occurring in the industry context or being organised by companies.	Work placement, Part-time job, Industrial conference.

To categorise vocational teachers' learning outcomes, the model of learning outcomes developed by Harland and Kinder (2014) was applied as a coding scheme. Although this model is developed for general teachers, it proved to be useful for analysing vocational teachers' learning outcomes as well (Zhou, Tigelaar, & Admiraal, 2021). Two categories (i.e., material and provisionary and informational outcomes) were not found and one category (student outcomes) was added. The coding categories are described in Table 2.2. To further describe the characteristics of these learning

outcomes, we assessed the significance of the outcomes with positive, negative, mixed, or non-significant.

Table 2.2 The coding categories of learning outcomes

Categories	Descriptions	Examples
Material and provisionary	Physical resources obtained from participation in learning activities.	Teachers get working manuals, pictures, and videos from industry practice.
Informational outcomes	Background information about curriculum and management developments.	Teachers get the latest information on educational reforms in vocational education.
Knowledge and skills	Teachers' deeper understanding of the issues related to pedagogy and teaching content.	Occupational knowledge, Pedagogical knowledge.
Value congruence	Teachers' personalised perspectives which are in line with others' views of 'good practice'.	Teachers perceive the importance of learning content for their teaching.
Affective outcomes	Teachers' emotional experience with learning.	Teachers are satisfied with their learning experience.
Motivational and attitudinal outcomes	Teachers' motivation to apply the ideas obtained from learning and changes in their attitudes.	Teachers desire to make applications of learning in their teaching.
New awareness	Teachers' perceptual or conceptual shifts.	Teachers acquire new insight from learning with respect to their teaching.
Institutional outcomes	Collective effects on teacher groups or other stakeholders.	Team performance, Industrial development.
Impact on practice	Teachers' changes in practice.	Teaching quality including classroom management, learning support, and application orientation.
Student outcomes	The changes in students' learning achievement or engagement.	Quality of student workplace learning.

2.3 Findings

All 54 selected studies were empirical, using qualitative, quantitative, or mixed research methods. The majority of the reviewed studies were conducted in Europe (40), particularly in the Netherlands (20). Others were conducted in North America (6), Oceania (5), Asia (2), and Africa (1). Besides, most of the selected articles were about secondary vocational education, of which graduates can either apply for a job or follow higher education. In this section, we will report the findings derived from the selected articles with respect to vocational teachers' learning activities and outcomes. In Appendix A, we summarised how the studies were classified.

2.3.1 Vocational teachers' professional learning activities

All 54 selected studies were found to be connected with vocational teachers' professional learning activities. The learning activities in these studies were classified into the following four categories:

2.3.1.1 Pre-defined professional development programme

Overall, 32 studies reported pre-defined learning programmes or activities, which were usually purposefully designed and supported by schools, educational departments, or scholars working inside or outside the schools. Some of them were organised nationwide for vocational teachers, such as the Swedish national initiative and Indonesia community-based teacher training (Andersson & Köpsén, 2015; Sumaryanta et al., 2019). Usually, a pre-defined professional development programme comprises several specific learning activities and is implemented over a long period.

Five of the 32 studies did not identify specific activities but used general terms to represent them, such as in-service teacher training programs, and education development days (Bouwmans et al., 2019; Csíkos, Kovács, & Kereszty, 2018; Iqbal 2020; Sirk, Liivik, & Loogma, 2016; Sumaryanta et al., 2019). Other studies explicitly specified and described those well-structured learning activities. Of these activities, a common one was a course, in which vocational teachers mainly learn from expert presentations, either in an online or offline setting. Based on the descriptions of the eight reviewed studies that reported on courses as a learning activity, the courses were often designed with several sessions and performed for from several weeks to a semester. The topics of these courses were often related to vocational teachers'

pedagogical skills, such as assessment skills and ICT skills (Castaño-Muñoz et al., 2018; Cochrane & Narayan, 2011; Hoekstra & Newton, 2017; Sandal, 2021; Winberg & Pallitt, 2016).

Another learning activity linked to courses was formal education, which was reported in four studies. Formal education is executed to upgrade vocational teachers' educational attainment or qualifications with a systematic combination of courses. The field of formal education was found to be related to teaching qualifications or specific vocations (Andersson, Hellgren, & Köpsén, 2018; Andersson & Köpsén, 2018; Lahiff, 2015; Lloyd & Payne, 2012). Regarding teaching qualifications, a number of vocational teachers attended in-service initial teacher training while already being employed in schools (Lahiff, 2015).

Moreover, some separate learning activities, i.e., workshops, seminars, conferences, forums, and meetings were also mentioned in 21 studies. These activities were always concentrated on a specific topic and conducted in one day or several days within a period. All of these separate activities in the selected studies were described with a high demand for interactions among vocational teachers except for conferences (Hodes et al., 2011). Apart from the above-mentioned learning activities, coaching/mentoring was also found to be a common activity, concerning specific guidance from professional supervisors for vocational teachers with regard to their practice in school. In the seven studies that reported on coaching/mentoring, these activities were not organised independently, which means it was usually followed by or combined with other formal activities, such as workshops or short courses (Smets & Struyven, 2020; Zeggelaar, Vermeulen, & Jochems, 2018, 2020). The duration of coaching or mentoring was usually at least several months.

2.3.1.2 Self-directed/initiated activities in school

Similar to general teachers, the school workplace is also an important context for vocational teachers' professional learning. As an important part of workplace learning activities, the self-directed/initiated activities in the school workplace emphasise vocational teachers' learning through their active exploration. Of the 54 selected studies, 19 studies reported learning from school-based and self-directed/initiated activities and more than half of them examined at least two specific activities.

More specific, 11 of 54 studies reported the activities 'learning from experimenting' and 'doing', which, respectively, concern vocational teachers' attempts to learn through trying new ideas or approaches, and through undertaking

daily work without a purpose of learning. Ketelaar et al. (2014) investigated eleven vocational teachers' learning experiences and found their learning activities had to do mostly with both learnings from experimenting and doing. However, compared to learning from doing, learning from experimenting was more frequently presented in the reviewed studies. Runhaar et al. (2014) found that learning from experimenting was a beginning and basic activity for implementing an educational innovation. Hoekstra, Kuntz, and Newton (2018) use 'trial and error' as a classification for referring to vocational teachers' learning activities concerned with making mistakes and trying to fix them.

Furthermore, learning from reflection is recognised as a common learning activity in 12 reviewed studies. In particular, many quantitative studies used reflection as an important activity to measure vocational teachers' engagement in professional learning (Messmann, Mulder Regina, & Gruber, 2010; Oude Groote Beverborg et al., 2015; Runhaar et al., 2010). Hoekstra, Kuntz, and Newton (2018) distinguished three levels of vocational teachers' reflective learning activities, i.e., action-oriented reflection (an evaluation of their actions), meaning-oriented reflection (a rational reason for selecting a certain way), and rapid/intuitive responses (a rapid/intuitive cognition).

Another self-directed/initiated activity mentioned in seven reviewed studies was learning from materials, such as books and videos (Andersson, Hellgren, & Köpsén, 2018; Andersson & Köpsén, 2018; Chatigny, Levesque, & Riel, 2012). In particular, reading books was more frequently reported in the reviewed studies and the types of books were diverse, like textbooks, journals, and professional literature (Chatigny, Levesque, & Riel, 2012; Runhaar et al., 2014; Sirk, Liivik, & Loogma, 2016). In the study of Runhaar et al. (2014), reading was found to occur much more frequently at the beginning of the implementation of an educational reform. Considering all the self-directed/initiated activities, reflection is frequently identified as the most common activity by the selected studies.

2.3.1.3 Collaborative activities in school

In addition to self-directed/initiated activities, collaborative activities are also an important source for vocational teachers' professional learning in the context of school. Of the 54 studies, 26 reported on vocational teachers' collaborative learning activities. Most of these activities happened among vocational teachers and some of them were implemented with a form of teacher professional learning community or team

(Alhanachi et al., 2021; Bouwmans et al., 2019; Runhaar et al., 2014; Vangrieken, Dochy, & Raes, 2016).

Concretely, several activities of peer collaboration were reported in the reviewed studies. Of these activities, sharing among vocational teachers was identified as the most common and basic activity (reported in 14 studies), which specifically refers to vocational teachers' exchange of materials, methods, and practical information and opinions. Although the researchers of the selected studies utilised different words to describe this activity, such as 'discussing different ideas' (Lloyd & Payne, 2012), 'learning in dialogue' (Hoekstra & Crocker, 2015), 'exchanging experiences' (Sirk, Liivik, & Loogma, 2016), and 'informal talk' (Runhaar et al., 2014), 'ask colleagues for advice' (Hoekstra, Kuntz, & Newton, 2018), sharing was seen as a fundamental feature of this activity.

In addition, peer observation or coaching was another valued activity (reported in 10 studies), which was particularly important for novice vocational teachers (Bouwmans et al., 2019; De Jong, Meirink, & Admiraal, 2021; Hoekstra & Newton, 2017; Hoekstra, Kuntz, & Newton, 2018). However, Runhaar et al. (2014) found that this activity was seldomly carried out by vocational teachers due to their lack of time.

Moreover, some studies reported a series of activities with a higher level of interaction among vocational teachers, which were related to collaborative work or research. These activities concerned lesson study or preparing lessons or assignments together, and were usually carried out in teams or professional learning communities (PLCs) (Alhanachi et al., 2021; Bouwmans et al., 2019; Runhaar et al., 2014). Throughout the above-mentioned activities, sharing was not only described as a separate activity but also frequently mentioned as a learning activity during peer observation or coaching and joint work activities (Hoekstra & Newton, 2017; Saunders, 2013).

Aside from colleagues, vocational teachers were also reported to learn from others, i.e., their vocational students and supervisors. For example, feedback from students and supervisors promotes them to reflect on their teaching practice and subsequently, to make changes in their practice (Hoekstra, Kuntz, & Newton, 2018; Hoekstra & Crocker, 2015). Regarding students' feedback, based on an analysis of the results from three related studies, vocational teachers were found to be merely actively instead of passively engaged in collecting feedback from their students, particularly when they were making changes in their classes (Hoekstra & Crocker, 2015). With

regard to supervisors' feedback, the performance management cycle is an important source for vocational teachers to receive feedback. For example, in the study of Hoekstra and Newton (2017), vocational teachers were assessed by supervisors based on classroom observations and by using a feedback template, and these activities were carried out in the context of a performance management cycle.

2.3.1.4 Industry-based activities

Due to the characteristics of vocational education and the dual-skill demand for vocational teachers, industrial working life has been considered a crucial context for vocational teachers' professional learning. This is particularly the case for teachers from school-based vocational education systems (Andersson & Köpsén, 2015, 2018). Learning activities occurring in an industry setting were reported in 12 of the 54 studies. In particular, Andersson & Köpsén (2018) and Broad (2016) summarised vocational teachers' possible learning activities related to specific vocations and a part of them were characterised as 'industry-based'.

Specifically, since plenty of vocational teachers take a responsibility for supervising or coordinating students in their placement or internships, they need to access to industrial places frequently, which may provide them with learning opportunities (Andersson, Hellgren, & Köpsén, 2018; Andersson & Köpsén, 2019). While being engaged with such activities, vocational teachers sometimes discuss with others (such as employees, and managers) in the industry about the current skill requirements and developments regarding a certain area. Additionally, courses organised by manufacturers are also an important source for vocational teachers' learning (Andersson, Hellgren, & Köpsén, 2018; Andersson & Köpsén, 2018; Andersson & Köpsén, 2019; Broad, 2016). Different from academic courses, these courses are usually focused on improving vocational teachers' occupational and practical expertise.

Moreover, learning from industry practice was reported by 10 studies addressing vocational teachers' learning through authentic experience in the real work context. In the investigation research of Broad (2016), vocational teachers' practice in the industry was carried out by more than 60% of participants. In particular, working part-time jobs and undertaking their work placement in the industry were deemed as the most common learning activities. Compared to working part-time, work placement in the industry is more prone to vocational teachers' professional learning in terms of its non-financial purpose. Until now, work placement has been implemented in many

countries, such as England and Australia (Lloyd & Payne, 2012; Schmidt, 2019). In Sweden, it is even considered as a primary activity and vocational teachers who participate in this activity are supported by the government (Andersson & Köpsén, 2015).

Other separate PD activities are also provided in the industry context, such as industry conferences, involvement with a professional body, and conducting research or projects in the industry (Andersson, Hellgren, & Köpsén, 2018; Broad, 2016; Schmidt, 2019). Considering all the activities occurring in the industry, learning from industry practice is becoming a more common activity that recently has been advocated more often by policymakers and school leaders (Andersson & Köpsén, 2015).

2.3.2 Vocational teachers' professional learning outcomes

Concerning the second research question, we found 37 studies that examined the learning outcomes of vocational teachers. And most learning outcomes were recognised as positive. Based on the model of Harland and Kinder (2014), eight types of learning outcomes were yielded.

2.3.2.1 Knowledge and skills

Among 37 reviewed studies on learning outcomes, 15 studies investigated vocational teachers' knowledge and skills as a type of learning outcome. Based on the descriptions in these studies, knowledge and skills were mainly divided into pedagogical and occupational aspects. More than half of these selected studies clarified pedagogical knowledge and skills, which specifically refer to vocational teachers' knowledge of employing and utilising student assessment (Hodes et al., 2011; Sandal, 2021), stimulating students' reflection (Tigelaar & Sins, 2020; Verberg, Tigelaar, & Verloop, 2013), understanding and responding to student differentiation (Alhanachi, de Meijer, & Severiens, 2021; De Jong, Meirink, & Admiraal, 2021), and applying technologies in the classroom (Cochrane & Narayan, 2011). Occupational knowledge and skills are described as vocational teachers' knowledge concerning subject-related occupations or crafts. These knowledge types are rather professional and practical in nature, which is in accordance with what students most need in vocational education. Only two studies explicitly focused on vocational teachers' pedagogical content knowledge (PCK). And learning PCK was found to be

particularly promoted when teachers have to teach a course which was not taught before (Hoekstra, Kuntz, & Newton, 2018; Virkkula & Nissilä, 2014).

2.3.2.2 Teaching practice

Changes in teaching practice were the most frequently reported outcome of vocational teachers' professional learning. These changes in teaching practice were examined in 25 of the 37 articles which reported on learning outcomes. According to our category system, vocational teachers' intended changes for teaching practice are also involved in this category, because the occurrence of impact on teaching practice usually needs an extensive time span. The changes in vocational teachers' teaching practice were mainly reflected and examined in the following two aspects.: First, vocational teachers use what they have learned to try out new ideas or make changes in their classroom practice. For example, Voerman et al. (2015) found that feedback interventions could significantly facilitate vocational teachers' frequency of offering feedback. Second, carrying out professional learning activities has been associated with an overall improvement of vocational teachers' teaching quality instead of particular behavioural changes. For instance, Warwas and Helm (2018) found that certain types of vocational teachers' professional learning community (PLC) were associated with their instructional quality including classroom management, learning support, and application orientation. This suggests that vocational teachers' learning outcomes about teaching practice were examined with either a specific or general perspective.

2.3.2.3 Affective outcomes

Affective outcomes were reported in 9 of 37 reviewed studies on learning outcomes, and address vocational teachers' feelings associated with learning, usually classified as 'reaction'. The reaction of vocational teachers towards their own learning has been described to become manifest in two forms, i.e., personal concerns and satisfaction. With regards to personal concerns, in four of the reviewed studies, the concerns-based adoption model (Hall & Hord, 2006) was used to describe the affective journeys of professional change experienced by vocational teachers while being involved in certain learning programmes or activities (Saunders, 2012, 2013; Zeggelaar, Vermeulen, & Jochems, 2018, 2020). This model illustrates four types of concerns, consisting of unrelated concerns, self-concerns, task -concerns, and impact concerns (George, Hall, & Stiegelbauer, 2006). The findings of Saunders (2012) indicated that collaboration which belongs to impact concern is the highest stage of concern for

vocational teachers. Besides, vocational teachers' satisfaction with their learning experience was also investigated in four studies. The scholars posited that most vocational teachers were satisfied with their learning availability, learning experience or learning transfer to their classroom practice (Hodes et al., 2011; Lloyd & Payne, 2012).

2.3.2.4 Value congruence

Value congruence refers to that vocational teachers perceive the importance of what they have learned for their teaching practice, and was reported in nine reviewed studies. From the reviewed studies, Sandal (2021) examined vocational teachers' professional development in assessment for learning within a programme and found that vocational teachers perceived 'the importance of setting goals together with the students, and as a basis for monitoring learning processes'. Smets and Struyven (2020) observed that vocational teachers who attended a programme related to differentiated instruction perceived the usefulness of what they implemented for their classes. Winberg and Pallitt (2016) explored the effect of an e-portfolio-related programme on vocational teachers' teaching practice and the results showed that vocational teachers began to understand how the e-portfolio could enhance and develop their teaching experience. Although most outcomes of value congruence were reported as positive, there was also a study reporting that vocational teachers believed 'learning from publications' had little use for their teaching (Broad, 2016).

2.3.2.5 Motivational and attitudinal beliefs

The category motivational and attitudinal beliefs describes vocational teachers' enhanced enthusiasm and desire to apply what they learned in their teaching practice, and was examined in 5 of 37 reviewed studies on learning outcomes. According to Harland and Kinder (2014), this category could also include vocational teachers' sense of self-efficacy and their identities. To begin with, three reviewed studies conceptualised vocational teachers' working or learning motivation as learning outcomes. For example, the vocational teachers participating in the study of Smets and Struyven (2020) expressed their desire to improve the use of assessment data based on their learning experience. In addition, vocational teachers' self-efficacy was identified as a crucial attitudinal outcome by some reviewed studies. A few qualitative studies reported that the vocational teachers participating in courses and workshops indicated in interviews that they felt more confident in their capabilities and

implementation of what they learned in their classroom practice (Cochrane & Narayan, 2011; Sandal, 2021; Saunders, 2013). Some quantitative literature also yielded positive effects of vocational teachers' professional learning on their self-efficacy (Oude Groote Beverborg et al., 2015). Moreover, only one study uncovered vocational teachers' identities as a learning outcome (Andersson & Köpsén, 2019). The identities were separated into teacher identity and occupational identity, which were related to vocational teachers' dual competencies.

2.3.2.6 Institutional outcomes

Institutional outcomes in our study describe the benefits or impact of professional learning on collegial, school, and even industry work-life development. There were 13 studies that reported this type of outcome. Concretely, regarding collegial development, most of these 13 studies focused on team learning or professional learning community (PLC) and employed quantitative methods. The results show that vocational teachers' team learning or professional learning community (PLC) facilitated shared cognition, task and goal interdependence among team members as well as team performance (Runhaar et al., 2014; Vangrieken, Dochy, & Raes, 2016). Besides, Schaap and De Bruijn (2018) presented not only colleagues' benefits from vocational teachers' professional learning, but also school benefits, including school environment benefits. Considering industrial development, the reviewed research discovered that vocational teachers' professional learning can promote industrial development. Broad (2016) noted that the hairdressing vocational teacher participants were more likely to recommend the manufacturer's tools and products to their students when they received guidance in their professional development activities from the manufacturer. Also, promoting vocational teachers' networks in the industry, and improving the industry's interest in vocational education were also considered as the outcomes of industrial development (Andersson & Köpsén, 2018).

2.3.2.7 New awareness

As outlined in the methods, based on the findings from the reviewed studies, we use an extended definition of the category of new awareness from the framework of Harland and Kinder (2014), i.e., it both refers to vocational teachers' shifts of their prior assumptions related to the curriculum and their teaching and also to an awareness that was not perceived before as learning. Among the 37 studies reporting on learning outcomes, 5 studies identified vocational teachers' new awareness as a learning

outcome. For example, Hoekstra, Kuntz, and Newton (2018) reported that a vocational teacher after participating in a series of learning activities proposed a new insight that vocational students might need an orientation to new teaching strategies. Ketelaar et al. (2014) who explored how to promote vocational teachers to familiarise themselves with their coaching role through work-based learning revealed that 28 vocational teachers thought the learning experience brought new insights for them. Also, Verberg, Tigelaar, and Verloop (2015) in their study on teacher learning with regards to supporting vocational students' reflections through negotiated assessment, found that the learning experience helped vocational teachers to become aware of their competence.

2.3.2.8 Student outcomes

The category student outcomes is an additional learning outcome category, based on the reviewed studies on vocational teachers' professional learning, which was not included in the model of Harland and Kinder (2014). It addresses students' changes resulting from vocational teachers' professional learning. However, only three studies examined vocational students' benefits from teachers' professional learning. Respectively, Schaap and De Bruijn (2018) employed questionnaires to investigate students' benefits from teachers' learning in a professional learning community (PLC), and their findings showed that students' mean scores varied with different types of professional learning communities (PLCs) and time. More specific, students' benefits had the highest score on a professional learning community (PLC) in which reflective dialogues were perceived as meaningful. In the study of Verberg, Tigelaar, and Verloop (2013), 15% of vocational teachers reported changes in their students' learning outcomes halfway through the learning procedure and 12% of them reported such changes at the end of the procedure. Andersson and Köpsén (2019) found that vocational teachers' visits to the industry could promote the engagement of supervisors in students' learning process and then influence the quality of workplace learning of students.

2.4 Discussion

This study provides an overview of findings on vocational teachers' professional learning in the past decade (2010-2021). To our knowledge, this is the first study to generalise the professional learning of vocational teachers. The review results provide

an overview of vocational teachers' learning activities and outcomes with consideration of a variety of contexts.

2.4.1 Learning activities

Four categories of learning activities were identified in our study, i.e., pre-defined professional development programme, self-directed/initiated activities in school, collaborative activities in school, and industry-based activities. These categories confirm that vocational teachers' professional learning can occur in academia, industrial, and work settings, and in both formal and informal ways.

Specifically, concerning the pre-defined professional development programme, most of the relevant learning activities are also implemented commonly for general teachers, which means vocational teachers' professional development experience is similar to general teachers. Our finding that initial teacher training was available for in-service vocational teachers could well be caused by the backgrounds of vocational teachers (Lahiff, 2015; Lloyd & Payne, 2012). In many countries, such as England, initial teacher training is not a precondition for being a vocational teacher. Vocational teachers who transform from the industry may not receive any teacher training, despite already being employed in schools (Lahiff, 2015). Moreover, we found that, in a number of studies, specific learning activities were organised as following each other, in particular mentoring/coaching or other experimenting activities. This could be an indication that the design of vocational teachers' learning procedures is becoming more coherent and consecutive, which might provide vocational teachers with a better learning experience.

Considering school-based learning activities, our study enriches the previous framework of school-based learning activities and makes it more comprehensive in the context of vocational education. Specifically, school-based learning activities were separated into self-directed/initiated activities and collaborative activities in school, the findings suggest that this classification provides a typical description of vocational teachers' school-based learning. As Oude Groote Beverborg et al. (2015) noted, 'VET colleges are expected to improve instruction through fostering individual and collaborative learning.' Regarding self-directed/initiated activities, our findings show that the learning activities in this category align well with four activities of general teachers' work-based learning activities concluded by Meirink, Meijer, and Verloop (2007) through reviewing previous studies, and this suggests that vocational teachers'

individual learning is quite similar to how other teachers learn within the school context. Although collaborative activities in school are also involved in the categories of Meirink, Meijer, and Verloop (2007), which is called 'learning from others with interaction', our study provides more detailed descriptions and classifications of it. We found that sharing, peer observation or coaching, and collaborative work or research were in accord with three categories of general teacher collaboration developed by Little (1990).

Furthermore, industry-based activities can be seen as a unique category of learning activities for only vocational teachers. There are many specific learning activities situated in the industry, and among these, a common one is learning from industry practice, which addresses working in a part-time job or doing a work placement in particular. Although relatively few studies focused on this category, the value of it has been emphasised. For example, Andersson and Köpsén (2018) explained the reason for engaging in the industry as 'current vocational knowledge is situated in specific work-life practices separated from the practice of the school.' In addition, we found that relevant studies of this category were mainly conducted in certain countries, such as Sweden, Australia, Finland, and England. The reason might be that the importance of vocational teachers' occupational competence is particularly attached in these countries.

2.4.2 Learning outcomes

Our systematic review also examined the learning outcomes of vocational teachers within different learning contexts. The model of learning outcomes from Harland and Kinder (2014) was utilised as a framework in our study. Generally, this model is proven to be useful to analyse and interpret vocational teachers' learning outcomes. The findings show that most of the relevant fragments could be framed well within this model, yet still, some adaptions were made for the role of vocational teachers. Firstly, material and provisionary outcomes and informational outcomes were not able to be observed in any of the reviewed studies. An explanation for this could be that both these two categories are considered as the lowest level within the hierarchy structure of learning outcomes in the model of Harland and Kinder (2014), and possibly the reviewed studies rarely investigated the outcomes which were preliminarily obtained by vocational teachers. Secondly, an additional category of student outcomes was supplemented to enrich the model. The adapted model extended

learning outcomes from vocational teachers' changes in cognition and behaviour to students' achievements, which enriches our understanding of the influence route of vocational teachers' professional learning.

A notable finding is that most of the learning outcomes reported in the reviewed studies were classified as positive, while negative, mixed, or non-significant results of learning outcomes were hardly reported. This is possibly due to a publication bias, because articles with significant and positive results of learning outcomes are more likely to be published or reported (Pigott et al., 2013). Among the categories of learning outcomes, we found that knowledge and skills, as well as teaching practice, were the most frequently identified learning outcomes. In terms of knowledge and skills, we found that most of the relevant studies concentrated on pedagogical and occupational knowledge and skills. The latter is more related to the real production or service instead of merely subjects. Furthermore, pedagogical content knowledge (PCK), as an important component of teachers' professional knowledge, was not often explicitly mentioned in the reviewed studies. However, Hoekstra, Kuntz, and Newton (2018) claimed that vocational teachers have 'a large portion of learning episodes involving PCK and pedagogy'. It appears that the learning of vocational teachers in terms of PCK has been overlooked in existing research on vocational teacher learning. Apart from changes in vocational teachers' knowledge and teaching practice, their emotional and attitudinal changes (such as affective outcomes and new awareness) were also illustrated in our findings, however, these were often only described in very general terms. An explanation could be that some of these aspects are not within the research concern of scholars. Moreover, the category of student outcomes was least frequently explored in the selected studies, possibly because student outcomes are only indirectly influenced by teachers' learning activities, and come along with changes in teaching practice.

2.4.3 Limitations

The current study has several limitations. Firstly, although we tried to generalise vocational teachers' professional learning, we only focused on learning activities and outcomes. Others, such as learning needs and antecedents have been not synthesised yet. Secondly, the findings are based on the search strings we have used. These search strings are related to combinations of informal and formal learning activities of vocational teachers. This focus has two limitations. The first one is that some studies

did include vocational teachers but together with general teachers and it was not clear which findings were related to which type of teachers. These studies were left out of the analysis. Furthermore, the search yielded activities and outcomes that were explicitly labelled as 'learning', either formal or informal. Yet it might be that studies on teachers' activities in school, industry or elsewhere include learning activities and outcomes of vocational teachers without labelling these as such. This might be the case for some studies on teachers' collaboration in school, which can be aimed at either work performance or learning or both.

Thirdly, in our literature search, we have restricted the language to English, which means that studies on our topic written in other languages have been excluded. This limitation might mean that we have missed out relevant publications in this field. This might be especially the case for regions with many potentially interesting studies like the well-documented vocational system in German-speaking countries in Europe.

Fourthly, although informal learning activities outside school and industry have been indicated as an emerging trend in professional learning (Macià & García, 2016), only two studies were extracted in this literature review. The reason might be that many of these studies are not explicitly presented as studies about learning activities of vocational teachers.

2.4.4 Implications

With the rapid development of contemporary society and industry over the past decade, vocational teachers are facing challenges in maintaining their teaching and industry currency. In this context, vocational teachers' professional learning has become more important and has raised more attention from policymakers, school leaders, and scholars. As noted previously, this is the first study that reviews vocational teachers' professional learning. The findings provide an overview of vocational teachers' learning activities and outcomes, which can be used as a theoretical basis for future researchers to discuss vocational teachers' learning as well as can offer certain potential directions for future professional development.

For theoretical implications, regarding vocational teachers' learning activities, first, our study summarised learning activities into four categories, which provides a comprehensive understanding of vocational teachers' learning approaches. This overview can be employed as a framework to investigate vocational teachers' engagement in professional learning and whether learning activities are different for

vocational teachers and general teachers. Second, the descriptive characteristics of learning activities may help scholars to select a focus of future research on professional learning. For example, reflection came out as the most common activity in the school workplace, learning from industry practice as the most frequent activity in the context of industry, and peer observation or coaching as particularly important for novice teachers.

Concerning learning outcomes, firstly, the adapted model with eight types of learning outcomes enriches our insight into vocational teachers' learning results and can be used as a general framework to examine vocational teachers' learning outcomes in various contexts. Secondly, although knowledge and skills were frequently explored by previous studies, PCK as an important aspect of it was less examined. Thirdly, in contrast with knowledge and skills and teaching practice, the other learning outcomes were much less reported in previous work. This might stimulate future researchers to extend their focus on vocational teachers' learning outcomes.

In addition, our results provide practical implications for the organisation of learning programmes or activities. For programme designers, to begin with, our findings showed that the current learning programmes usually contain more than one activity and those activities were connected well, which seems that the design of vocational teachers' learning programmes is becoming more coherent and consecutive. Some of the descriptions of current programmes or activities from the reviewed studies can provide designers with information on how the designs of programmes might look like and can support them to think about how to improve their programme designs. For example, in the study of Smets & Struyven (2020), a programme includes two consecutive phases: first an academic training on a specific pedagogical topic, and second an implementation period in which the participants were coached. Additionally, the eight types of learning outcomes summarised by us could be both the learning objectives and the desired learning outcomes of programmes. So, designers could take into account all of these outcomes as specific objectives to guide their programme designs. Finally, as we found that learning content varied with learning activities, programme designers may make use of these results to select appropriate activities to match certain learning content. For example, in the reviewed studies, teachers usually participated in academic courses to obtain pedagogical knowledge and skills, whereas their participation in industry practice was mainly aimed at improving their occupational knowledge and skills.

For school leaders, the first implication is that they may encourage vocational teachers to learn from a combination of different contexts instead of one single context. The review showed that vocational teachers' professional learning can occur in academia, school workplace, and industrial context, and with formal and informal learning ways. Second, our study also illustrated the conditions for the occurrence of learning activities. For example, learning from experimenting is particularly common, when implementing an educational innovation. Peer observation or coaching, however, is seldomly conducted by vocational teachers because of a lack of time. These results could reinforce school leaders to consider measures on how to promote vocational teachers' learning engagement or outcomes. Third, the adapted model of eight types of learning outcomes could be a practical framework for school leaders to assess vocational teachers' learning.

2.4.5 Concluding remarks.

Vocational teachers' professional learning is still not synthesised yet. Our research systematically reviewed 54 articles on vocational teachers' professional learning. Four categories of learning activities were identified with consideration of various learning contexts and eight types of learning outcomes were classified, which related to teachers' changes in cognition and behaviours as well as student and institutional outcomes. These results contribute to a basic but comprehensive theoretical overview for future scholars and provide practical suggestions for school leaders or programme designers to support vocational teachers' professional learning.

Chapter 3

The relationship between vocational teachers' motivational beliefs and their engagement in work placement

This chapter is an adapted version of
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Abstract

Work placement has been regarded as one of the most effective ways of developing vocational teachers' occupational expertise. Guided by expectancy-value theory, we aim to explore how vocational teachers' motivation towards professional learning shapes their engagement when on work placement. Two research questions were addressed: 1) What is the relationship between vocational teachers' motivational beliefs and engagement in work placement? 2) Does teaching experience have a moderating effect on this relationship? The data was collected from an online survey and analysed in a quantitative way. The participants were 426 Chinese secondary vocational teachers. Exploratory factor analysis identified four motivational beliefs: task value, self-efficacy, task effort, and emotional cost. Regression analysis revealed that vocational teachers' task value, self-efficacy, and task effort were positively related to their engagement. Teachers' emotional cost was negatively linked to their behavioural, cognitive, and emotional engagement, but positively linked to agentic engagement. Moreover, a negative moderation of teaching experience was seen. These findings facilitate the understanding of vocational teachers' professional learning at the work site and provide suggestions on how to reinforce their engagement. Future research could examine the relationship between vocational teachers' motivational beliefs and engagement from a longitudinal perspective or within other learning contexts.

3.1 Introduction

Keeping vocational knowledge updated plays a crucial role in the advancement of vocational teachers' teaching practice (Broad, 2016; Tyler & Dymock, 2019; Zaid & Champy-Remoussenard, 2015). Specialist knowledge, skills and behaviours for work are best acquired through hands-on, work-based learning, rather than a theoretical, desk-based school curriculum (Andersson & Köpsén, 2018; Hordern et al., 2022). To retain vocational teachers' occupation-specific expertise, work placement has been implemented in many countries, including Finland, Australia, China, and England, albeit with different labels, such as work placement periods, industry release, and hands-on programmes. In our study, the term 'work placement' is defined as a continuing professional development programme in which vocational teachers acquire occupational knowledge and skills through participating in 'the vocational, work-life community of practice of their teaching subject' (Andersson & Köpsén, 2015, p2). It facilitates and stimulates vocational teachers in the expansion of their traditional role and in crossing boundaries between schools and working life (Andersson & Köpsén, 2015; Lloyd & Payne, 2012).

For the past decade, work placement has obtained much support from policy-makers in many countries, especially those countries with a typically school-based vocational education system. For example, a Swedish national initiative included work placement as the primary programme, and teachers who attended this programme were entitled to receive financial support from the state (Swedish National Agency of Education, 2019). Similarly, the Chinese government issued a series of documents that required all vocational teachers to undertake work placement for at least one month annually and for six months within each five-year period (Ministry of Education of the People's Republic of China, 2016; The State Council of the People's Republic of China, 2019). In this context, a growing number of vocational teachers are being encouraged to take part in work placement arranged by educational departments, vocational schools, or themselves.

Although work placement has potential benefits, several Chinese studies have indicated that many vocational teachers show a low commitment towards this programme, despite being forced to attend under the pressures of school leaders or policies (Gou & Yang, 2019; Zhang & Fang, 2016). Zhang and Fang (2016) investigated 604 Chinese vocational teachers from 13 cities and found that in work placement more than 40% of them stood aside as bystanders. Earlier research has

discerned that there are certain obstacles that cause vocational teachers to avoid participating in or engaging in work placement, such as increased workload and financial problems (Lloyd & Payne, 2012). In contrast to these external barriers, teachers' motivational beliefs might provide an important additional explanation for their engagement. However, no researchers have explored in depth how teachers' motivational beliefs relate to their efforts in work placement. In our study, the expectancy-value theory is employed to clarify the association between vocational teachers' motivational beliefs and their engagement in work placement. Two research questions are formulated as follows:

RQ1. What is the relationship between vocational teachers' motivational beliefs and their engagement in work placement?

RQ2. Does teaching experience have a moderating effect on this relationship?

3.2 Work placement: a theoretical framework

3.2.1 Expectancy-value theory

Teachers' motivation to engage in professional learning has enjoyed a great deal of attention in the past decade (Appova & Arbaugh, 2018; Gorozidis & Papaioannou, 2014). Expectancy-value theory has been captured as an influential framework in explaining teachers' learning motivation and performance (Richardson & Watt, 2010). Although this theory was originally developed to understand children's and adolescents' motivation for achievement, it has proved to be fruitful in exploring adults' learning motivation (Gorges & Kandler, 2012).

Expectancy-value theory was introduced and developed by Eccles et al. (1983) in the field of education. It acknowledges that individuals' choice, persistence, and performance can be explained by their expectancy for success and their task value. These two motivational components are associated with two questions that individuals can ask themselves: 'Can I do this task?' and 'Do I want to do this task and why?' (Eccles et al., 1983; Eccles & Wigfield, 1995; Wigfield & Eccles, 2000; Wigfield, 1994). The following three sub-sections set out the research on these motivational factors.

3.2.1.1 Task value

Task value refers to an individual's perception of the value of working on a future task

(Eccles et al., 1983; Eccles & Wigfield, 2002; Pintrich et al., 1991). Eccles et al. (1983) split task value into multiple components: attainment value, intrinsic value, utility value, and cost. Attainment value refers to the importance of doing a task well, intrinsic value to the enjoyment gained from doing the task, and utility value to the usefulness of doing the task. In many studies, task value has been measured with these three value subscales, which appear to be highly correlated (Eccles & Wigfield, 1995). Muis et al. (2018) conducted a confirmatory factor analysis to examine the structure of task value, and their results showed that a one-factor model was the best fit, rather than a three-factor model. Recently, scholars have preferred to separate cost from the task value component, and have identified it as a new factor that is used to represent motivation (Jiang, Rosenzweig, & Gaspard, 2018; Osman & Warner, 2020).

Building on expectancy-value theory, teachers' task value for professional learning is conceived as a powerful driver of teachers' choice to participate and perform. Teachers like to attend those learning programmes or activities that intrigue them or assist them in improving their teaching practice (Guskey, 2002; Rutherford, Long, & Farkas, 2017). Besides, teachers' perception of value has been found to be positively associated with performance in professional learning. Zhang et al. (2016) found that the task value perception of pre-service teachers was positively linked to their performance in a learning programme, via extrinsic learning motivation.

3.2.1.2 Cost

The term 'cost' refers to what an individual has to invest and give up to accomplish a task (Osman & Warner, 2020; Wigfield, 1994). Eccles et al. (1983) defined cost as a multifaceted factor comprising the effort required to achieve a task, the lost opportunities to become involved in other valued programmes, and the emotional cost concerned with the anxiety and stress of undertaking a task. Recently, Flake et al. (2015) suggested a new construct named 'outside effort', which describes the time, effort, or amount of work needed for all other tasks. Jiang, Rosenzweig, and Gaspard (2018) developed another construct to describe an individual's fear of failing in a task.

The role of cost in motivation has been debated in the last decade. Many scholars who stand by Eccles et al. (1983) consider cost as a part of task value (Berge, Parrila, & Deacon, 2018; Trautwein et al., 2012). However, a growing number of researchers have become sceptical, and have attempted to split cost from the task value component (Flake et al., 2015; Jiang, Rosenzweig, & Gaspard, 2018; Perez, Cromley, & Kaplan, 2014). Jiang, Rosenzweig, and Gaspard (2018) discovered that if the perceived cost

is treated as an independent variable, this could result in additional variance in predicting students' academic outcomes. Moreover, recent studies have proposed that cost should not be considered as a totally negative component. The high or low level of cost doesn't mean that the tasks are worth doing or not. As Gorges mentioned, 'even an educational program associated with high levels of costs may be the best choice from a range of alternatives' (2016, p34).

To date, there has been some research that traces the link between students' perceived cost and their academic achievement. The cost was found to predict students' academic goals, grades, and persistence. Higher perceived cost induces avoidance of achievement and higher drop-out intentions (Perez, Cromley, & Kaplan, 2014). However, increasingly contradictory findings about this relationship have been found. Jiang, Rosenzweig, and Gaspard (2018) clarified that there is a positive relationship between students' perceptions of cost and approach goals. In the field of teachers' professional learning, there are no studies focusing on the association between teachers' perceived cost and performance or persistence.

3.2.1.3 Self-efficacy

Self-efficacy is generally conceptualised to mean how well individuals believe they can do in an upcoming task (Wigfield & Eccles, 2000). Expectancy for success is treated as a vital factor to predict achievement. A high correlation between ability and expectancy has been proved (Eccles et al., 1993; Eccles & Wigfield, 1995), and in some pieces of research ability belief and expectancy for success are not separated (Wigfield, 1994). Pintrich et al. (1991) adopted both ability belief and expectancy for success to measure individuals' expectancy component. Authors of more recent studies have used self-efficacy to represent the expectancy component (Bergey, Parrila, & Deacon, 2018; Perez, Cromley, & Kaplan, 2014; Trautwein et al., 2012).

The linkage between self-efficacy and performance has been contentious for a long time. Self-efficacy theory stated that individuals with high belief in their ability would set themselves a difficult goal, which may lead them to great effort and high performance (Bandura 1977, 1997). Conversely, ample research has insisted on the opposite view, that is, that self-efficacy negatively influences performance, especially at the within-person level (Vancouver & Kendall, 2006; Vancouver, Thompson, & Williams, 2001). This standpoint is supported by control theory, which emphasises that higher self-efficacy implies that a closer goal is set and less effort is needed (Powers, 1973). Several moderating indicators in the relationship between self-

efficacy and performance have been identified, such as goal difficulty and experiences of failure (Beck & Schmidt, 2012; Hardy, 2014).

3.2.2 Learning engagement

Learning engagement is commonly used as an indicator for assessing teachers' professional learning. Fredricks Blumenfeld, and Paris (2004) recognised engagement as a multidimensional factor that encompasses the behavioural, cognitive, and emotional aspects of engagement with a programme. Behavioural engagement refers to an individual's effort, attention, and persistence throughout a learning programme. Cognitive engagement is defined as the strategies used to achieve a greater understanding of ideas. Emotional engagement is realised as the emotional involvement during a programme, shown in such aspects as enjoyment and curiosity (Li et al., 2016; Skinner et al., 2008). Conceptualisations of learning engagement mostly address individuals' reactions to learning programmes, but neglect their agentic action to develop and modify the programmes. Thus, Reeve and Tseng (2011) distinguished agentic engagement to depict an individual's efforts to promote learning programmes and issues.

Although several constructs of engagement have been identified, a majority of scholars commonly draw on behavioural indicators to measure teachers' or students' learning engagement. For instance, Flowerday and Shell (2015) used reading and writing time to assess students' engagement in a learning programme. Jansen in de Wal et al. (2014) measured the frequency of participation in diverse learning programmes or activities to appraise teachers' engagement in professional learning. Zhang and Liu (2019) conducted open coding based on teachers' behaviours to investigate their online learning engagement. So far, no studies have been performed to investigate teachers' engagement in learning programmes based on multiple constructs.

3.2.3 Relationship between motivation and learning engagement

In expectancy-value theory, engagement has been viewed as a pivotal mediating factor that links motivation and achievement (Wigfield et al., 2015). The existing research has revealed the linkages between teachers' motivation and engagement in various contexts and in a general way. For example, Jansen in de Wal et al. (2014) showed

that teachers with an autonomous profile were most engaged in all learning activities, whereas 'externally regulated' teachers were the least engaged. Jones, Johnson, and Campbell (2015) showed that undergraduates' task value for reading was positively connected with their cognitive engagement, and Wang and Eccles (2013) reported that students' academic self-concept and task value were positively related to their engagement in school. Yet these studies have limited value for the current study. First, the role of cost in explaining engagement has not been identified. Second, most research on the relationship between motivation and engagement has been focused on students instead of teachers. Third, the underlying structure of motivational beliefs and engagement in these studies is ambiguous.

3.2.4 Motivation, engagement, and teaching experience

In several studies on teachers' professional learning, differences between novice and experienced teachers have been found. First, compared to experienced teachers, novice teachers experience lower teaching efficacy (Tschannen-Moran & Hoy, 2007; Zhu et al., 2018). Other research has shown that, as teaching experience increases, teachers' participation in professional learning may reduce (Grangeat & Gray, 2007). Secondly, teachers in different career stages usually have different knowledge structures, which are related to differences in learning needs, motivations, and preferential approaches (Louws et al., 2017b). Thus, when they are participating in the same programme, novice teachers' motivation and engagement may differ from those of experienced teachers. Thirdly, the literature shows that teachers with less experience in a learning programme report higher growth in their professional knowledge after participation (Xie et al., 2017). It can be inferred from these studies that, in contrast to experienced teachers, novice teachers find it particularly effective to engage in learning programmes. Based on the above, teaching experience seems to be an important factor both related to teachers' motivation for and engagement in professional learning. However, no research ever involved teaching experience while exploring the association between motivation and engagement.

From the literature, it appears that teachers' motivational beliefs about professional learning are related to their engagement and performance. However, until now, most literature only revealed a partial relationship between them, while no comprehensive exploratory research in this area has been conducted. This suggests a space for further research on the relationship between vocational teachers'

motivational beliefs and their engagement in professional learning and the contribution of their teaching experience as a moderator in the context of work placement.

3.3 Work placement in the context of the Chinese vocational education

The Chinese vocational education system includes secondary vocational education (3 years, age 16–18 years) and higher vocational education (3-4 years, age from 18 years). More than 40% of students after lower secondary education step into secondary vocational schools. Although the general courses are still available, more occupation-related courses are arranged at this level of education. After graduation, two main routes can be identified that lead them to either college or a job.

Until now, vocational education in China has been traditionally school-based, despite increasing opportunities for student internship or placement in the last year of graduation. In recent years, the concept of 'double-qualified teachers' was introduced and developed in the Chinese vocational education system, which implies that vocational teachers are supposed to have both theory-based and practice-based teaching competence (The State Council of the People's Republic of China, 2005). In this context, a variety of programmes have been provided for in-service vocational teachers, in a particular work placement, a programme which promotes teachers' occupational competence.

To date, work placement has been designed and organised nationwide with the guidance of the Chinese government. Although teachers have the freedom to seek companies and occupations by themselves, a number of teachers prefer considering the options offered by schools. During work placement periods, teachers could work on tasks just like the other employees or attend other activities occurring in working life to develop an understanding of the world of work.

3.4 Methodology

To answer our research questions, a quantitative research approach was applied. The theoretical model underlying our study is shown in Figure 3.1. The survey was designed and conducted to investigate vocational teachers' motivational beliefs and engagement for work placement.

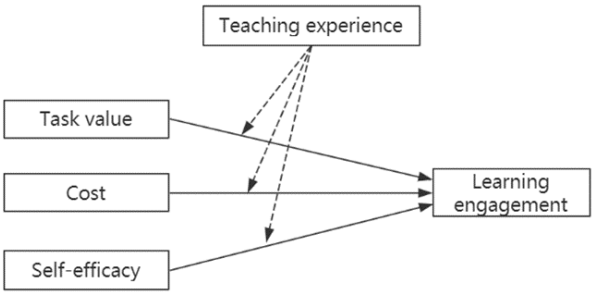

Figure 3.1 Conceptual model of our study

3.4.1 Participants

The participants were 426 Chinese secondary vocational teachers who taught students aged fifteen to seventeen (56% were female, and 90% had attained a bachelor's degree or higher level of education). Their age ranged from 23 to 57, with the mode age group being 34-40. Their teaching experience in years ranged from 1 to 37. All participants had experience with work placement, and more than half (57.51%) of them had attended a work placement in the last year. Among all the participants, 182 teachers (42.72%) had worked in companies for at least a year before becoming a teacher. The sample reflected a wide range of teaching subjects (e.g., mechanical engineering, computer, cooking, accounting, and nursing).

3.4.2 Procedures

An online survey using Qualtrics was applied to collect data. To improve the measures of the survey, five vocational teachers were invited to participate in a pilot test. This test was performed by a cognitive interview which involves 'interviewers asking survey respondents to think out loud as they go through a survey questionnaire and tell them everything they are thinking' (Drennan, 2003, p57). The questionnaire items were further adapted using the opinions provided by these participants. For the final investigation, we obtained support from Tongji University, which had partnerships with a number of vocational schools. We sent the participants a link or QR code to the questionnaire via email and WeChat. Most teachers spent 10 to 15 minutes completing the questionnaire with 62 items. Data collection started on 15 February 2020 and

ended on 15 March 2020. It was explained to participants that participation was voluntary, and that the data would be kept confidential and would only be available for research purposes. Our study acquired ethical approval from ICLON Research Ethics Committee with the number IREC_ICLON 2020-06.

3.4.3 Measures

The questionnaire used in this study was presented in Appendix B, and it contained four scales that separately aimed at measuring task value, cost, self-efficacy, and engagement.

3.4.3.1 Task value

Teachers' task value was assessed using a scale adapted from the paper by Bergey, Parrila, and Deacon (2018) that focused on undergraduates' task value of attending university. This questionnaire covered four dimensions: intrinsic value, attainment value, utility value, and cost, as originally defined by Eccles et al. (1983). Fifteen items from the first three positive value dimensions were adopted in the present study (the cost dimension will be presented below), and two items adapted from the work of Bråten and Ferguson (2015) were added to make the scale more comprehensive. Intrinsic value was assessed through five items (e.g., 'I enjoy work placement'). Attainment value was measured with six items (e.g., 'It is important to me to be a person who has experience with work placement'). Utility value was investigated with six items (e.g., 'What I learn in work placement helps me in my teaching'). Teachers rated their agreement with each item, ranging from 1 ('It's not applicable to me at all') to 7 ('It's totally applicable to me') with 'neutral' serving as the midpoint. Considering the current disputation of the structures of task value and the different contexts between the adapted scales and original scales, the exploratory factor analysis was conducted in our study to explore the possible constructs, which is also applicable for other beliefs and engagement. The results with varimax rotation show that there was only one factor specified from the task value scale, with a total of 65.61% of the variance explained. This means task value is a unidimensional factor, which is consistent with the finding of Muis et al. (2018). The Cronbach's alpha for this scale was 0.97.

3.4.3.2 Cost

Cost was measured using a scale based on the paper by Flake et al. (2015). The

original scale used ‘too much’ language to stress the negative nature of cost, with statements such as ‘I worry too much about this class’. As a number of studies find that cost is different from the barriers and it could even promote participation in educational programmes (Gorges, 2016), the word ‘too’ was deleted from the original items to change the attribute of cost. Based on a principal component analysis with varimax rotation on the 13 items, two components were extracted, including task effort and emotional cost, with 64.38% explained variance. Three items were taken to assess teachers’ task effort (e.g., ‘Work placement demands much of my time’) and four items were used to measure teachers’ emotional cost (e.g., ‘I worry much about work placement’). The items were measured on a 7-point Likert scale ranging from 1 = ‘It’s not applicable to me at all’ to 7 = ‘It’s totally applicable to me’, with ‘neutral’ serving as the midpoint. The Cronbach’s alphas for these two subscales were, respectively, 0.79 and 0.73.

3.4.3.3 Self-efficacy

Teacher self-efficacy for work placement was measured with a five-item scale adapted from the MSLQ-SE (Pintrich et al., 1991). This scale investigates the extent to which teachers believe that they can do well in a work placement. The original scale with eight items was developed to assess two domains of the expectancy component: expectancy for success and self-efficacy. Five items were extracted from it (e.g., ‘I'm certain I can master the skills being presented in work placement’). The items were measured on a 7-point Likert scale ranging from 1 = ‘It’s not applicable to me at all’ to 7 = ‘It’s totally applicable to me’, with ‘neutral’ serving as the midpoint. Based on the result of an exploratory factor analysis with varimax rotation for the self-efficacy scale, all five items were grouped into one factor with 68.76% explained variance. The Cronbach’s alpha for all items was 0.89.

3.4.3.4 Learning engagement

Learning engagement was assessed with four subscales adapted from the works of Skinner et al. (2008) and Reeve and Tseng (2011). All scales used a 7-point Likert response scale, ranging from 1 (‘It’s not applicable to me at all’) to 7 (‘It’s totally applicable to me’), with ‘neutral’ serving as the midpoint. The behavioural engagement scale had five items (e.g., ‘I pay attention in work placement’). The cognitive engagement scale covered four items (e.g., ‘In work placement, I try to connect what I’m learning with my teaching experience’). The emotional cost scale

included four items (e.g., 'In work placement, I feel curious about what we are learning'). The agentic engagement scale consisted of five items (e.g., 'During work placement, I express my opinions'). An exploratory factor analysis with varimax rotation was conducted, and two factors were extracted: one, a combination of behavioural engagement, cognitive engagement, and emotional engagement, and the other agentic engagement. The explained variance was 63.56%, and the Cronbach's alphas were, respectively, 0.94 and 0.80.

3.4.4 Data analysis

A Pearson correlation analysis was employed with SPSS 26.0 to examine the correlations between all the measured variables as well as teaching experience. Furthermore, to ascertain the relationship between motivational beliefs and engagement (RQ1), multivariate linear regression analysis was conducted with SPSS 26.0. Learning engagement was used as a dependent variable, while motivational factors were utilised as independent variables. To verify the influence of teaching experience on the linkage between motivational beliefs and engagement (RQ2), moderating effect analysis was conducted with Mplus 8.3. Apart from motivational variables, the interaction terms between the teaching experience variable and the motivational variables were also added as independent variables. R-squared (R^2) was used to represent the proportion of the variance for a dependent variable that is explained by the independent variables in the model. The unique contribution of each independent variable to the model was appraised with squared semi-partial correlation (Sr^2).

3.5 Results

3.5.1 Descriptive statistics and bivariate correlations

In Table 3.1, descriptive statistics and correlations for all the measured variables and teaching experience are displayed. The highest score among the motivational variables was for the teachers' task value (M=5.99), and the lowest score was for the emotional cost (M=3.97). The Pearson correlation coefficients showed that teachers' task value was positively correlated with task effort, self-efficacy and learning engagement, but negatively correlated with emotional cost. Teachers' perceived task effort had a positive correlation with all the other motivational and engagement

variables. Moreover, teachers' emotional cost was negatively correlated with self-efficacy and behavioural, cognitive, and emotional engagement. Finally, the results showed that teaching experience had a positive correlation with task value, task effort, emotional cost, and engagement.

Table 3.1 Descriptive statistics and correlations between teachers' motivational variables, engagement variables, and teaching experience.

Variable	M	SD	1	2	3	4	5	6	7
1. Task value	5.99	0.86							
2. Task effort	5.41	1.06	0.36**	1					
3. Emotional cost	3.97	1.11	-0.21**	0.44**	1				
4. Self-efficacy	5.83	0.90	0.85**	0.35**	-0.21**	1			
5. Behavioural, cognitive, and emotional engagement	6.03	0.81	0.91**	0.41**	-0.19**	0.85**	1		
6. Agentic engagement	5.21	1.00	0.61**	0.39**	0.00	0.68**	0.62**	1	
7. Teaching experience	14.00	8.25	0.12*	0.11*	0.10*	0.08	0.13**	0.11*	1

Note: *p<0.05, **p<0.01

3.5.2 The relationship between motivation and learning engagement

Regression analysis was adopted to identify the association between teachers' motivational beliefs and learning engagement with work placement (see Table 3.2). The results of collinearity diagnostics showed that there was no multicollinearity problem existed (VIF<10 and Tolerance >0.1). The results show that task value and self-efficacy were significantly positive predictors (β=0.652, 0.236), whereas emotional cost was a negative predictor of behavioural, cognitive, and emotional engagement (β=-0.061). It is worth noting that teachers with stronger perceived task effort showed higher behavioural, cognitive, and emotional engagement (β=0.122). Similarly, task effort and self-efficacy positively predicted agentic engagement (β=0.111, 0.576). In addition, teachers' emotional cost was positively related to agentic engagement (β=0.098). This suggests that if teachers' perceived cost and self-efficacy are stronger, their agentic engagement with work placement tends to be higher. In terms of explained variance, the task value accounted for the largest proportion of variance in predicting behavioural, cognitive, and emotional engagement (Sr^2=0.110), and self-efficacy had the largest percentage of variance in predicting agentic engagement (Sr^2=0.089).

Table 3.2 Results of regression analysis for motivational variables predicting learning engagement.

Predictor	**Behavioural, cognitive, and emotional engagement**					**Agentic engagement**				
	B	**S.E.**	**β**	**Sr^2**	**R^2**	**B**	**S.E.**	**β**	**Sr^2**	**R^2**
Task value	0.614	0.034	0.652**	0.110	0.856	0.117	0.079	0.101	0.003	0.497
Task effort	0.094	0.019	0.122**	0.009		0.105	0.043	0.111*	0.007	
Emotional cost	-0.045	0.017	-0.061**	0.002		0.088	0.039	0.098*	0.006	
Self-efficacy	0.212	0.032	0.236**	0.015		0.641	0.075	0.576**	0.089	

Note: *p<0.05, **p<0.01.

3.5.3 The moderating effect of teaching experience

After importing teaching experience into the model, the interaction variables between teachers' motivational measures and teaching experience were created. As shown in Table 3.3, there were two interaction variables that significantly predicted teachers' behavioural, cognitive, and emotional engagement: task effort by teaching experience (β=-0.305) and emotional cost by teaching experience (β=0.204). At the same time, task effort was a positive predictor (β=0.211), but the emotional cost was a negative predictor (β=-0.144) of teachers' behavioural, cognitive, and emotional engagement. These results suggest that the lower the teaching experience, the stronger the relationship of task effort and emotional cost with behavioural, cognitive, and emotional engagement in the context of work placement. No interaction variable displayed a significant relationship with teachers' agentic engagement, which means there was no moderating effect of teaching experience on the relationship between motivational beliefs and agentic engagement.

Table 3.3 Results of moderating effect analysis of teaching experience.

Predictor	**Behavioural, cognitive and emotional engagement**			**Agentic engagement**		
	B	**S.E.**	**β**	**B**	**S.E.**	**β**
Task value	0.576	0.064	0.611**	0.182	0.148	0.157
Task effort	0.162	0.037	0.211**	0.171	0.085	0.181*
Emotional cost	-0.105	0.034	-0.144**	0.119	0.078	0.133
Self-efficacy	0.209	0.063	0.231**	0.557	0.146	0.501**
Teaching experience	-0.005	0.015	-0.049	0.032	0.035	0.266
Task value × teaching experience	0.003	0.004	0.186	-0.005	0.009	-0.250
Task effort × teaching experience	-0.005	0.002	-0.305*	-0.005	0.005	-0.228
Emotional cost × teaching experience	0.004	0.002	0.204*	-0.002	0.005	-0.095
Self-efficacy × teaching experience	0.000	0.004	0.002	0.006	0.009	0.308

Note: *p<0.05, **p<0.01.

3.6 Discussion and conclusion

In our study, the expectancy-value theory was applied in order to investigate vocational teachers' motivation and how this motivation was linked to teachers' engagement in the context of work placement. The results revealed that vocational teachers' motivational beliefs were highly relevant to their engagement, and that their years of teaching experience moderated this relationship. The current empirical evidence clarified the roles of distinct motivational beliefs in explaining vocational teachers' engagement in work placement.

3.6.1 Relation between motivational beliefs and engagement in work placement

The findings of our study provide evidence that vocational teachers' task value and self-efficacy are the prominent predictors of their engagement in work placement, which is in line with most previous studies. Specifically, task value was identified as a positive predictor of behavioural, cognitive, and emotional engagement. This means that the more highly vocational teachers value their work placement, the greater the attention they will pay to work-based learning, the higher the cognitive strategies and resources they will implement, and the more emotionally involved they will be in work placement. This finding is in line with the stipulations of expectancy-value theory and with most previous research (Eccles et al., 1983; Jones, Johnson, & Campbell, 2015; Zhang & Liu, 2019). Task value explained the largest proportion of variance in behavioural, cognitive, and emotional engagement, which indicates that task value was most prominent among motivational beliefs.

Turning to self-efficacy, a positive relationship between vocational teachers' self-efficacy and their engagement with work placement was revealed. This finding resonates with Bandura's self-efficacy theory, which proposed that individuals' ability belief is related to their goal setting, activity choice, intention to increase investment, and persistence (Bandura, 1997). A body of research has shown that a person with greater self-efficacy invests more effort or resources in a task (Judge et al., 2007). Furthermore, the results showed that self-efficacy explained the largest proportion of variance in predicting teachers' agentic engagement. A possible explanation is a close connection between individuals' ability and their agency (Kurunsaari, Tynjälä, & Piirainen, 2018; Toom, Pyhältö, & Rust, 2015). When vocational teachers believe that they are capable of a work placement, they have more confidence and initiative in

voicing their opinions to develop this programme.

We also explored the relationship between teachers' perceived cost and their engagement in work placement. The finding was that teachers' task effort was positively related to their engagement, which is in contrast with most previous research. This finding may be explained by insights with regard to attribution theory and self-worth theory from Asian perspectives. Regarding attribution theory, some authors have found that in Asian cultures an individual's success or failure is attributed more to their effort than to their ability (Mok, Kennedy, & Moore, 2011). From these studies, it can be inferred that, in Asian cultures, the greater one's desire to succeed or improve, the greater the effort one perceives to be required. Another possible explanation for this finding that teachers' task effort was positively related to their engagement is based on research conducted by Jiang, Rosenzweig, and Gaspard (2018). This research found that Korean students' perceived cost positively predicted their approach goals. According to these authors, this finding could be attributed to East Asian students' perceptions of self-worth. Following this explanation, when students perceive the costs to be higher, they might endorse stronger performance-approach goals, to retain their self-worth. Maintaining self-worth can also be a plausible explanation for the finding that teachers' task effort is positively related to their engagement in work placement, because, in China, work placement is a mandatory programme for vocational teachers. Teachers who perceive the task effort to be higher may tend to be more highly engaged in work placement in order to maintain their self-worth among colleagues who are all participating in this compulsory programme.

Moreover, our study confirmed that teachers' emotional cost was negatively associated with behavioural, cognitive, and emotional engagement, and yet positively associated with agentic engagement in work placement. This finding highlighted that vocational teachers' stress, exhaustion, and weariness in their work placement were detrimental to their fundamental engagement, but could provoke their agentic engagement. Other research has indicated that teachers' unpleasant emotions in professional learning might lead to disengagement, rudeness, and even a refusal to implement the practices presented during training (Gaines et al., 2019). However, these negative emotions perhaps stimulate teachers to develop professional development programmes through expressing their opinions and suggestions.

3.6.2 Effect of teaching experience on motivation and engagement in work placement

Our study showed that teachers' teaching experience was positively correlated with their motivation for and engagement in work placement. In addition, the relationship between motivational beliefs and engagement varied with teaching experience. The association between task effort and emotional cost, on the one hand, and behavioural, cognitive, and emotional engagement, on the other, was stronger for novice teachers than for experienced teachers. Building on previous research, a possible explanation for the linkage between teaching experience and motivation and engagement is that teachers vary in their learning aims and goals during their careers (Anderson & Olsen, 2006; Louws et al., 2017c). Novice teachers might be more eager to learn and improve their repertoire of teaching skills such as classroom management and classroom instruction than to acquire more occupational knowledge and skills. Therefore, novice teachers' motivation for and engagement in work placement may be lower than those of experienced teachers. Furthermore, novice teachers are always faced with more learning opportunities than experienced teachers. However, their energy is limited, which means that they are not able to put much effort into each learning programme. They might be more concerned about the costs of learning programmes, especially those programmes that are not generally expected. Therefore, in the context of work placement, novice teachers' perceived cost might be more strongly associated with their engagement than is the case for experienced teachers.

3.6.3 Conclusions

Our study sought to answer two research questions. First, what is the relationship between vocational teachers' motivational beliefs and their engagement in work placement? Second, does teaching experience have a moderating effect on this relationship? The regression analysis results of our study revealed that task value and self-efficacy explained the largest percentage of variance and had positive relationships with engagement. The results of moderating effect analysis indicate that there is a difference in the association between motivational beliefs and engagement depending on teaching experience. These findings facilitate the understanding of vocational teachers' professional learning from the work site and provide evidence of

how to promote vocational teachers' engagement.

There are four limitations addressed, which provide directions for future research. Firstly, the participants were all secondary vocational teachers from China. In future research, more attention could be given to higher vocational teachers' motivation and how this links to their engagement in work placement. Secondly, our study observed different constructs of motivational beliefs and engagement from the previous studies, which were related to student learning. Future studies are suggested to continually verify these structures in other contexts or conditions of teacher professional learning. Thirdly, the relationship between cost and engagement was demonstrated in our study. However, the results are opposite to most other studies, which have been explained with the attribution theory and self-worth theory from Asian perspectives. Further research is necessary to validate these explanations. Fourthly, the data collected in our study is cross-sectional, which means causal conclusions can't be generated. Therefore, longitudinal studies could be considered in the future to explore the influence of teachers' motivational beliefs on their engagement.

Our study has strong implications for future research. Vocational teachers' low engagement in work placement has been usually explained from the perspective of external barriers (Andersson & Köpsén, 2015; Lloyd & Payne, 2012), while internal beliefs are less concerned. Our study enriches the current explanation for vocational teachers' learning engagement in the work context. In particular, the significant moderating effect of teaching experience moves beyond previous research and could inspire future researchers to pay more attention to differences connected to teaching experience when exploring the linkage between vocational teachers' motivation, engagement, and performance for professional learning.

Aside from the contribution to research, there are three potentially important implications for practice. Although the current research uses a cross-sectional design, we would like to formulate implications on how to increase vocational teachers' engagement in work placement. Since the results of our study showed a significant relationship between teachers' motivation and their engagement in work placement, policy-makers and school leaders ought to bring in measures to stimulate vocational teachers' motivation for work placement. First, the positive association between task value and engagement implies that improving vocational teachers' task value perception would provide an impetus to their engagement in work placement.

Teachers' value perception of work placement could be improved in a positive way by, for example, encouraging vocational teachers to share their experiences in work placement with their colleagues to help their colleagues to become aware of its potential and benefits. Second, because of the positive relationship between self-efficacy and engagement, it may be feasible to increase teachers' self-efficacy for work placement to boost their engagement. Enhancing teachers' self-efficacy in work placement might be done by linking the placements to the teachers' teaching subjects to align with their sense of control and providing more information related to the companies and occupations before placement. Third, as the linkage between emotional cost and behavioural, cognitive, and emotional engagement is negative, reducing the pressure on teachers and their exhaustion in relation to work placement would be an option to make them more engaged in this programme. Maximising teachers' freedom of choice during the placement process may relieve teachers of the emotional burden of this programme. A good way would be to encourage teachers, especially novice teachers, to give voice to their opinions about the types of work placement they would like. Teachers with different preferences should be entitled to more personalised options for placement programmes.

Chapter 4

Understanding vocational teachers' professional development in work placement: learning goals, activities, and outcomes

This chapter is an adapted version of
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Abstract

This study provides an insight into the professional development of vocational teachers within the context of work placement, a continuing professional development programme situated in the industry. Learning goals, activities, and outcomes have been described based on vocational teachers' learning experiences in this programme. We conducted interviews with 27 secondary vocational teachers from China and 5 of these participants completed digital logs. Seven categories of learning activities were identified, of which learning from others with and without interaction were the most common categories, while mentoring was more frequently perceived as an important category than others. Moreover, there were eight types of learning goals and twelve types of learning outcomes reported. The participants preferred teaching and working knowledge and skills as their learning goals more than beliefs and attitudes with respect to learning from work placement. Intentions for teachers' practice were concentrated on the school, collegial, and individual classroom practice levels. Regarding the perceived relationship between learning activities and outcomes, mentoring and learning from others (with and without interaction) were connected with all or almost all learning outcomes. The occupational knowledge and skills were frequently generated from all identified activities except reflecting. Limitations and theoretical and practical implications are discussed.

4.1 Introduction

'I'm really afraid that my students can't be qualified for a job. The knowledge from textbooks is possibly not enough. I need to know what is happening in the industry and bring it to my class.' (Barbara, one of the teachers in this research)

How to promote vocational students' successful transition from school to work has always been an intriguing and important topic in the field of vocational education (Akkerman & Bakker, 2012; Esmond, 2020). To be able to prepare vocational students for the role of competent practitioners, vocational teachers are supposed to keep their occupational knowledge and skills up to date and relate this to their school practice (Andersson & Köpsén, 2018; Tyler & Dymock, 2019). This is particularly important for vocational teachers from school-based vocational education systems (Andersson & Köpsén, 2018). To support vocational teachers in this task in several countries various learning activities and programmes have been employed. For example, in Australia, a series of activities are advocated by the government, such as working part-time in industry, belonging to industry associations, and undertaking accredited training relevant to the industry area (Australian Skills Quality Authority, 2017).

An example of such a programme for vocational teachers situated in the industry world is 'work placement', a continuing professional development programme in which vocational teachers retain their occupational expertise through participating in 'the vocational, work-life community of practice of their teaching subject' (Andersson & Köpsén, 2015, p.2). The literature indicates that work placement has been the most prevalent programme for vocational students to develop their occupational competence, and therefore it is also considered valuable for vocational teachers' professional development and advocated by policy-makers (Andersson & Köpsén, 2015; Zaid & Champy-Remoussenard, 2015). To date, work placement has been implemented in many countries, such as England, Finland, Sweden, France, Australia, and China, using different labels, like industry release in Australia and hands-on programmes in England (Schmidt, 2019; Lloyd & Payne, 2012). The value of work placement for vocational teachers has been illustrated in the recent literature (Andersson & Köpsén, 2015; Zaid & Champy-Remoussenard, 2015). Little is known, however, about how vocational teachers' learning takes place and what changes occur in their mind and school practice related to the context of work. Therefore, our study aims to reveal the process of vocational teachers' professional learning during work placement with an exploration of their learning goals, activities, and outcomes.

4.1.1 Work placement as a context for Chinese vocational teachers' professional development

In China, as the context of our study, work placement has been implemented nationwide. In recent years, the concept of 'double-qualified teachers' was proposed by the Chinese government and developed within the Chinese vocational education system, which implies that vocational teachers are supposed to acquire both theory-based and practice-based teaching competence (The State Council of the People's Republic of China, 2005). To achieve this goal, work placement was designed and organised with the guidance of the Chinese government. Since 1997, the government has enacted several policies of first encouraging and later forcing vocational teachers to participate in work placement. A document issued in 2019 requires that all vocational teachers should undertake work placement for at least one month every year (The State Council of the People's Republic of China, 2019).

Although vocational teachers have the freedom to seek host organisations and occupations by themselves to undertake their work placement, options for work placement are also offered to them by designers from schools or municipal educational departments. The designers of work placement usually schedule tasks for the participating teachers in work placement that are similar to those of the other employees in the host organisations. However, while being engaged in work placement, not all teachers actually work on the tasks that are organised for them. This can occur for several reasons. Firstly, because the vocational teachers that take part in work placement are not part of the regular staff within the host organisations, they are not entitled to multiple benefits and they do not have to follow the rules of the host organisations. Secondly, the tasks on the job are generally rather professional and complicated, which means that vocational teachers, especially those teachers with less occupational experience, might have difficulties in performing in the everyday work process. Thirdly, the period of work placement is usually not long, which means that vocational teachers must go back to school when they become familiar with the daily work. Fourthly, the main aim of work placement is teacher learning, which means that teachers attend other activities, such as observing others' work, rather than carrying out tasks all the time. The Chinese government also encourages vocational teachers to learn from a variety of activities during work placement (Ministry of Education of the People's Republic of China, 2016). Normally, the activities in work placement are

designed and arranged for vocational teachers based on the setting of the host organisations, on the one hand, and the preferences of the participating vocational teachers within those organisations with regards to what and how to learn, on the other hand.

From the previous section, it becomes clear that work placement can be seen as a continuing professional development programme for vocational teachers situated in the industry. Still, the complicated context of work placement involves that teachers' learning in this context is different from professional learning in other common contexts, such as teachers in schools or other professionals at the workplace. Consequently, when exploring vocational teachers' learning in work placement, the vocational context should be particularly taken into account. However, the current literature on vocational teachers' professional development in work placement and vocational contexts is quite limited. Therefore, in our theoretical framework, we will use the perspective of teacher professional development, with consideration of studies on learning at work by other professionals.

4.1.2 Teachers' professional development

4.1.2.1 Teacher learning activities

In the past two decades, a number of scholars have worked on the identification and categorisation of teacher learning activities in the school context as a work setting (Hoekstra et al., 2009; Meirink, Meijer, & Verloop, 2007). Meirink, Meijer, and Verloop (2007) distinguished five categories of teacher learning activities in school by reviewing previous studies, consisting of (a) learning from doing, (b) learning from experimenting, (c) learning from reflecting, (d) learning from others with interaction, and (e) learning from others without interaction. A similar categorisation was generated by Lecat et al. (2019), while learning from doing, experimenting, and reflecting are viewed as the subcategories of learning from oneself. Studies on teacher learning activities in the school as a workplace indicate that this learning can be both formal and informal, and a body of research describes informal activities that are not structured or planned (Hoekstra et al., 2009; Lecat et al., 2019).

Given that our study is conducted in the Chinese vocational education context, and that the participating teachers are learning in companies, the company workplace may influence the forms of learning activities. For example, vocational teachers may have opportunities to receive in-company training which is provided for employees

during work placement (Zhang & Fang, 2016). In previous insights from studies on learning at work, common learning activities have been identified, including in-company formal training, learning through task execution, learning through reflection, learning through exploration, learning via colleagues, and mentoring (Lapointe & Vandenberghe, 2017; Manuti et al., 2015; Nikolova et al., 2014). The learning activities found in studies on learning at work are quite similar to teachers' informal learning activities in school as reviewed by Meirink, Meijer, and Verloop (2007). This is possibly because, the school context is also a type of workplace.

4.1.2.2 Teachers' learning goals and outcomes

In previous research, a positive association between teachers' learning goals and participation in learning activities has been found, which entails that high learning goal orientation could motivate teachers' efforts to learn (Kunst, Woerkom, & Poell, 2018). Learning goals refer to teachers' aspirations regarding changes in their behaviour or cognition (Louws et al., 2018). With regard to participation in a programme, learning goals can also be regarded as teachers' expectancies of learning outcomes with respect to professional development and school practices. In this way, learning goals and outcomes can be analysed and interpreted from the same perspective.

A substantial amount of literature has explored teachers' learning outcomes from the perspective of changes in their professional development (Harper-Hill et al., 2020). Within the teacher change model initiated by Guskey (1986) the changes in teachers' beliefs and attitudes, teaching practices, and student outcomes are understood as the three major components of teacher development. However, it could be difficult to catch these three types of outcomes at the same time because often there is a sequence in their occurrence. Harland and Kinder (2014) took into account this sequential perspective when developing their model for understanding the possible outcomes of the continuing professional development of teachers in in-service education and training (INSET). It encompasses nine types of learning outcomes, such as knowledge and skills and new awareness. In Table 4.1, the sequence of the different types of outcomes is summarised. In Harland and Kinder's (2014) model, the impact on practice is deemed the ultimate outcome with respect to behaviours, which can be obtained either directly or through indirect paths, in a process that is influenced by the other outcomes.

Table 4.1 A sequence of INSET outcomes.

INSET input			
3rd order	Material and provisionary outcomes	Informational outcomes	New awareness
2nd order	Motivational and attitudinal outcomes	Affective outcomes	Institutional outcomes
1st order	Value congruence	Knowledge and skills	
Impact on practice			

4.1.2.3 The connection between learning activities and outcomes

A large number of studies have revealed what teachers learn without depicting a clear relationship with what these teachers did. In some other studies, this relationship has been made. For example, Bakkenes, Vermunt, and Wubbels (2010) utilised chi-square tests to quantify the relationship between learning activities and outcomes. The results showed that learning activities reported by the teachers, such as considering one's own practice and getting ideas from others, could be associated to a significant extent with changes in teachers' knowledge and beliefs, intentions for practice, emotions, and actual practice. Moreover, Hoekstra et al. (2009) explored to what extent teacher learning activities can be connected with changes in their conceptions and behaviour and found a significant difference in frequencies of a variety of activities among four clusters of teachers created according to their initial and change scores on the questionnaire.

4.1.3 The present study

Previous studies have provided insights into teachers' professional development through their learning goals, activities, and outcomes. Nevertheless, most of these studies have been constructed in a school-based environment instead of other professional contexts which enable additional learning opportunities for teachers in vocational education in particular. Although work placement has been a popular and valuable programme for in-service vocational teachers in many countries, until now, research in this area has been limited. Our study aims to contribute to a comprehensive understanding of teachers' professional development in work placement. The findings can inspire programme designers, school leaders, or policymakers in their efforts to

support teachers' learning. In our study vocational teachers' professional development in work placement is investigated from the perspective of teachers' perceived learning goals, activities, and outcomes. Three research questions direct this study:
RQ1. What are vocational teachers' perceived learning activities in work placement and which activities do they perceive to be important?
RQ2. What are vocational teachers' perceived learning goals and outcomes?
RQ3. How do vocational teachers perceive the connection between their learning activities and outcomes?

4.2 Method

4.2.1 Participants

To explicitly portray vocational teachers' learning experiences in work placement, in-depth interviews were conducted in this study, for which we used a semi-structured interview guide. The participants were 27 secondary vocational teachers from Shanghai, who were selected based on the following criteria: 1) participants should attend work placement during the summer break of 2020; 2) participants should undertake work placement for at least one month; 3) the sample is heterogeneous in age, gender, teaching experience, teaching subjects, occupational experience, and school. It was explained to the participants that participation was voluntary and that their digital logs and interview data would be kept confidential and would only be available for research purposes. The current study received ethical approval from ICLON Research Ethics Committee with the number IREC_ICLON 2020-06. Table 4.2 shows teacher participants' background information, including fictional names, teaching domain, teaching experience, and occupational experience.

Table 4.2 Participants' information.

Num	Fictional names	Gender	Teaching domain	Teaching experience (Years)	Occupational experience (Yes/No)
1	Alice	Female	Agriculture information	2	No
2	Barbara	Female	Accounting	24	No
3	Cara	Female	Accounting	22	No
4	Baron	Male	Internet of things technology	6	Yes, several years
5	Calvin	Male	Automobile beauty	14	No
6	Dora	Female	English for tourism	1	Yes, 3 years
7	Grace	Female	Engine inspection and maintenance	4	No
8	Dave	Male	Automobile maintenance	3	Yes, 4 years
9	Frank	Male	Painting	7	No
10	Harry	Male	Electric control	6	No
11	Jeff	Male	Welding	7	No
12	Kristin	Female	Marketing and e-commerce	3	No
13	Mark	Male	Intelligent manufacturing	13	Yes, several years
14	Maria	Female	Computer application	21	No
15	Mike	Male	Welding	1	Yes, 18 years
16	Peter	Male	Internet of things technology	3	Yes, 1 year
17	Rose	Female	Graphic design	7	No
18	Sara	Female	Package design	12	No
19	Wendy	Female	Architectural working drawing	4	Yes, 2 years
20	Steven	Male	Mould manufacturing and design	15	No
21	Tina	Female	Construction project budget	16	No
22	Tom	Male	Digital controlled lathe	18	No
23	Sandy	Female	Digital publishing	20	No
24	Penny	Female	Nursing gerontology	3	Yes, 2 years
25	Nancy	Female	Physiology	7	No
26	Mona	Female	New media	1	Yes, 1 year
27	Nydia	Female	Digital media	15	No

4.2.2 Data collection

4.2.2.1 Procedures

The participants were interviewed individually within one week of completing their work placement. All the interviews were conducted by the first author and online via WeChat. The average time of each interview was around 45 minutes. All the interviews were audio taped and transcribed verbatim with the permission of the interviewees. After the interviews, each transcript was sent back to the interviewee with a request to respond to the first author concerning whether it was accurate. All the interviewees responded positively, which means that there were no revisions or additions needed in the transcripts.

Furthermore, the authors received five profiles of digital logs from those teacher participants who indicated that they would like to share their logs with the first author during the interviews. Then, the authors organised the data based on a timeline for each participant. As shown in Table 4.3, each of these five participants had at least four digital logs for work placement.

Table 4.3 The number of digital logs for the participants.

Name	Number of digital logs
Kristin	4
Mark	8
Peter	4
Tina	6
Penny	4

4.2.2.2 Semi-structured interview

Semi-structured interviews were developed to understand vocational teachers' perceptions of their process of professional development in work placement. The interview protocol was focused on three themes: 1) learning activities that teachers used in work placement; 2) learning goals that teachers set for work placement; 3) learning outcomes that teachers obtained from work placement, including their intentions for practice (see Appendix C for the interview protocol). Interviews started with open questions, such as 'Could you please introduce your experience with this

work placement you just completed?'. Following the open starting questions of each interview, teachers were asked to report on their learning activities, goals, and outcomes. A checklist with follow-up questions was applied with a list of possible constructs.

4.2.2.3 Digital logs

Although the authors did not request vocational teachers to write down their learning experiences during their work placement, several vocational teachers were required by their school leaders or programme providers to write logs recording their work placement experience weekly. All these logs had a similar structure, which aimed to answer three main questions related to the period of work placement, including 'What did you do during this week', 'What do you get from this week?', and 'What are your feelings about this week?'. Although the writing logs were not included as data sources in the research design, we did use them in our analyses to examine the validity of the findings from the interviews (see the section on coding and analysis), which means that the digital logs were not used in the findings.

4.2.3 Development of schemes

The authors analysed the raw data with the guidance of the coding schemes generated from previous literature. The categories of learning activities are derived from Meirink, Meijer, and Verloop (2007). To adapt the context for our study, two categories from professionals' workplace learning were supplemented. Mentoring and formal training were added from Lapointe and Vandenberghe (2017) and Manuti et al. (2015). Therefore, a seven-category scheme of vocational teachers' learning activities has been constructed (see Table 4.4). Regarding learning goals and outcomes, a coding scheme was developed based on the model of Harland and Kinder (2014). To elaborate on teachers' knowledge changes, the category of knowledge and skills was split into occupational knowledge and skills and new ideas for teaching, which address teachers' occupational and pedagogical aspects, respectively. Impact on practice in the original model refers to teachers' intentional changes in their school practice, and it is described with teachers' intentions for school practice for the next semester after participation in work placement in our study. To make vocational teachers' changes in practice clearer, the impact on practice was excluded from the scheme and explored independently.

Table 4.4 The categories in coding schemes.

Learning activities	Learning goals and outcomes
Doing tasks	Material and provisionary outcomes
Experimenting	Informational outcomes
Formal training	Occupational knowledge and skills
Learning from others with interaction	New ideas for teaching
Learning from others without interaction	New awareness
Mentoring	Affective outcomes
Reflecting	Motivational and attitudinal outcomes
	Institutional outcomes
	Value congruence outcomes

4.2.4 Coding procedures and analysis

To answer the research questions, the coding and analysis of the 27 interviews were carried out. The authors chose the fragments in which teachers reported their learning goals, activities, outcomes, and the relationship between activities and outcomes as coding and analysis units. A fragment usually represents one coherent and continuous view, no matter the length or number of sentences. Additionally, to check the inter-rater reliabilities, an independent researcher coded six transcripts independently by using the final categories for learning goals, activities, and outcomes. The Cohen's kappa statistic was used to measure the agreement on the ratings of two independent coders. The benchmarks were as following: $\leqslant$0=poor, 0.01-0.20=slight, 0.21-0.40=fair, 0.41-0.60=moderate, 0.61-0.80=substantial, and 0.81-1=almost perfect (Landis & Koch, 1977). Based on the inter-rater reliabilities, no adaptions were needed for the categories.

Specifically, to generate the categories of teacher learning activities in work placement, the relevant fragments were firstly identified and then placed into the existing categories from the scheme in terms of their meanings. All fragments could be included within the scheme, which means that teachers' learning activities in work placement could be grouped into seven categories in line with the scheme (with Cohen's kappa 0.85).

The same procedure was conducted in coding and analysing teachers' learning goals and outcomes except intentions for practice. Yet, for learning outcomes, aside from the nine codes of categories from the scheme applied in the transcripts, six new

codes were produced and then adjusted as three new categories, which were named as finding a gap, personal life, and research ability. Moreover, three categories were redefined with the content of the fragments. The Cohen's kappa for the final categories of learning outcomes was 0.78.

Concerning learning goals, three categories (motivational and attitudinal outcomes, new awareness, and value congruence) from the scheme could not be connected to any fragment, while two categories (finding a gap and research ability) were added to the scheme (with a Cohen's kappa of 0.87).

Considering intentions for practice, the transcripts were coded and analysed with the following three steps: Firstly, the fragments related to teachers' planned changes in their school practice were realised and labelled. Next, the labels were merged into categories based on the main issues that teachers would like to perform. There were six categories generated (with Cohen's kappa 0.89). Then, these categories were formed into levels with regard to their perspectives. Three levels, including the school, collegial, and classroom practice were identified finally.

Based on the identified learning activities and outcomes, the perceived relationship between the activities and outcomes was coded. An example of the reports was, 'I talked with some new employees who had just graduated from school to get the points of competence requirement for entry', which was coded as 'learning from others with interaction related to occupational information'. As teachers seldom talked about what types of activities led to their intentional changes in practice, this study would like to ignore the intentions for practice and focus on other outcomes when exploring the relationship between learning activities and outcomes.

For a check on the validity of the findings from the semi-structured interviews, the digital logs were also coded by using the final coding schemes. Also, the codes from digital logs were compared with the interview codes to check for consistencies between these two types of data. The results showed that all fragments in the logs could be coded with the categories in the revised scheme and for each of these five participants, the codes for their digital logs were also observed in their interview transcripts.

To answer the first and second research questions, the categories relevant to the teacher participants' learning goals, activities, and outcomes are described, and the number of participants who mentioned these categories was counted to identify the most common categories. To answer the third research question, a cross table was

applied to analyse the participants' perceived relationship between learning activities and outcomes.

4.3 Results

4.3.1 Learning activities

To obtain information about vocational teachers' learning activities in work placement, teachers were asked to report the specific activities that they attended during their most recent experience. In Table 4.5, the descriptive results are presented. Seven categories were identified separately: 1) 'doing tasks' refers to vocational teachers' engagement in routine work; 2) 'experimenting' means teachers make trials in their practice; 3) 'mentoring' describes assigned mentors' guidance for teachers' practice or learning; 4) 'reflecting' describes teachers' thinking with purpose, which is related to their practice in host organisations or schools; 5) 'learning from others with interaction' underlines teachers' communication with different individuals during work placement as teachers might learn from colleagues, managers, and other teacher participants who attend work placement with them through direct dialogues; 6) 'learning from others without interaction' implies that teachers learn from various objects or through self-exploration. Reading materials, observation, and searching for information online are all included; 7) 'formal training' refers to activities arranged by host organisations and obtained via an elaborate design, such as lectures, organised visiting inside or outside host organisations, and practical training. A participant described her formal training experience during work placement:

> 'I experienced a comprehensive induction training with other new employees. It started from acquainting the company culture, then focused on improving work-related skills. It's an opportunity for me to become familiar with this occupation. This training took me around one week in total.' (Cara, 21st August, 2020)

For activity categories, the results in Table 4.5 show that most teacher participants used combinations of various activities during work placement. Learning from others with and without interaction were the most frequently reported categories and mentoring was most frequently perceived as an important category, followed by learning from others with interaction and formal training.

Table 4.5 The categories and specific activities with the number of participants reported (n = 27).

Activity category	**Number of participants (Attending)**	**Number of participants (Important)**	**Specific activity**	**Number of participants (Attending)**	**Number of participants (Important)**
Doing tasks				19	10
Experimenting				16	8
Mentoring				16	14
Reflecting				15	4
Learning from others with interaction	25	12	Colleague	16	9
			Manager	6	1
			Teacher participants	11	1
			Meeting/discussion	8	0
Learning from others without interaction	24	7	Observation	20	7
			Reading	13	1
			Searching online	5	0
Formal training	19	11	Lecture	14	5
			Practical training	6	5
			Visiting	12	2

4.3.2 Learning goals and outcomes

Based on the analysis, twelve categories of learning outcomes were identified and eight categories of them were reported as learning goals. The descriptions for each category are displayed in Table 4.6. Six categories were in line with the coding scheme in terms of the descriptions, including affective outcomes, motivational and attitudinal outcomes, new awareness, new ideas for teaching, occupational knowledge and skills, and value congruence. Three categories from the scheme generated by Harland and Kinder (2014) were redefined based on the interviews. The first one is materials and provisionary outcomes. As most materials can be captured as teaching cases in our study, combining materials and cases appeared to be a good way to reconstruct this type of outcome. The second category that has been adapted is institutional outcomes, which not only relates to school or collegial development but also contributes to host organisations, such as relieving employees' workload. The third category is informational outcomes, which were originally described as the information linked to

teachers' courses. In our study, the informational outcomes that teachers obtain from work placement are concentrated on occupational information, which refers to information about work culture, work environment, salaries and benefits, career development, and staff regulations that are relevant to vocational students' career identity. This category as a type of learning outcome is further illustrated in the following quotation:

> 'During work placement, I talked a lot with several employees. For example, I asked them how did they get the qualification of technician, how many years did they work before getting this qualification, and whether some qualifications were only accepted by certain companies instead of the whole industry. Then, I could tell my students all of these.' (Grace, 27th August, 2020)

Table 4.6 The categories of goals and outcomes with the number of participants reported (n = 27).

Categories	Descriptions	Goal	Outcome
Affective outcome	Emotional changes during work placement.	1	23
Finding a gap	Experiencing a gap between vocational education and work.	4	18
Institutional outcome	Outcomes on the level of schools, teacher groups, and work organisations.		11
Materials and cases	Physical resources or cases that teachers get from work placement.	3	17
Motivational and attitudinal outcomes	Teachers' motivation to apply the ideas obtained from work placement.	0	9
New awareness	Teachers' perceptual or conceptual shifts in thinking.	0	16
New ideas for teaching	Teachers' deeper understanding or concrete ideas related to teaching.	12	19
Occupational information	Occupational information related to students' career choice and development.	5	26
Personal life	The benefits for teachers' personal life instead of teaching practice.	0	6
Occupational knowledge and skills	The improvement of teachers' knowledge and skills of work.	23	27
Research ability	The development of teachers' research competence.	4	5
Value congruence	Teachers' personalised perspectives which are in line with work placement designers' views of 'good practice'.	0	15

In addition to the revision of three categories of learning outcomes, three new categories were developed: (1) finding a gap, involving that vocational teachers discover the gap between vocational education and work, which could inspire them to explore how to fix it in their future school practice; (2) personal life, referring to the benefits for teachers' socialising, interests, and some other personal aspects, which are separated from their roles as teachers; and (3) research ability, which concerns teachers' research and project knowledge or experience that could be reinforced through involvement in the work context. One participant stated how his research ability was developed during work placement:

> ‘At that time, I was doing a research project relevant to a particular technology. Therefore, during work placement, I focused on the related knowledge through discussing with mentors, intentionally collecting materials while doing tasks. I think it’s quite effective.’ (Mark, 31st August, 2020)

In comparing the types of learning goals and outcomes, it is clear that the participants reported learning goals for work placement related to acquiring knowledge and skills, whereas their learning outcomes were much more diverse. Furthermore, as shown in Table 4.6, occupational knowledge and skills were most frequently reported by the participants as learning goals, followed by new ideas for teaching, while occupational knowledge and skills and occupational information were the most common outcomes for them.

To understand vocational teachers’ possible changes in their school practices, the participants were invited to talk about their intentions for practice in the next semester. These intentions for school practice refer to the category of impact on practice of the original model of Harland and Kinder (2014). The results in Table 4.7 show the teachers’ intentions with respect to three levels: school, collegial, and individual classroom practice. Within the school level, the results included developing new curricula or educational standards and maintaining school-company cooperation, both of which were beneficial for school education in general. The collegial level emphasised teachers’ sharing and collaboration with their colleagues to improve the collective teaching performance or professional development based on their work placement experience. The intentions within their classroom practice level were focused on teachers’ planning changes for their teaching practice after participation in work placement. Four categories were specified from the interviews, including adapting teaching content, enriching teaching resources, providing career guidance, and organising competence-based activities or settings. For example, a participant talked about how she planned to adapt teaching content based on her work placement experience:

> ‘I seldom noticed the details when working on web design in my previous teaching practice. For instance, how to choose a typeface. I didn’t know that before and I used to pick one at random. However, I got some standards for selecting a typeface during work placement. I would like to explain them to my students.’ (Maria, 31st August, 2020)

Table 4.7 The categories and specification of intentions for practice with the number of participants reported (n = 27)

Level	Category	Specification	Num
School	Improving school education	-Developing new curricula or educational standards. -Prompting school-company cooperation.	6
Collegial	Collaborating with colleagues	-Sharing work placement experience with colleagues. -Helping colleagues to improve teaching practice.	7
Individual classroom practice	Adapting teaching content	-Importing newly acquired content from work placement. -Restructuring the current teaching content.	17
	Enriching teaching resources	-Introducing cases acquired from work placement. -Adding materials obtained from work placement, such as videos, pictures, and manuals.	16
	Providing career guidance	-Introducing occupational information to students. -Offering students career advice.	16
	Organising competence-based activities or settings	-Adjusting the time of theoretical and practical sections of courses to develop students' practical skills. -Organising other activities, such as teamwork, to develop students' other work-related competence.	12

4.3.3 The relationship between learning activities and outcomes

As shown in Table 4.8, in general, all learning activity categories were related to many learning outcomes, with mentoring and learning from others (with and without interaction) as the categories connected to all or almost all learning outcomes. Vocational teachers' occupational knowledge and skills were obtained most frequently from all learning activity categories except reflecting. For example, Alice mentioned 'If I want to know this equipment, my colleagues would tell me what's the function

of it, how it works, and how to operate it'. The quotation indicates that this participant acquired significant occupational knowledge and skills, particularly from communication with colleague employees during work placement. It is worth mentioning that not all perceived learning outcomes displayed in Table 4.6 were related to the specific categories of learning activities because some outcomes were generated from attending the whole programme instead of specific activities. For example, participant Calvin said, 'Through work placement, I found a gap between what our students learned from school and what they were supposed to perform in the real company workplace'. However, he did not mention which specific activity or context made him find this gap. Therefore, each value related to the connection between a certain learning activity category and outcome in Table 4.8 was less than the total number of participants mentioning this learning activity or outcome.

Table 4.8 The number of participants who perceived the connection between the learning activities and outcomes (n = 27)

	Doing tasks	**Experimenting**	**Mentoring**	**Reflecting**	**Learning from others with interaction**	**Learning from others without interaction**	**Formal training**	**Participants for each type of outcome**
Affective outcome	2	0	3	0	4	3	3	23
Finding a gap	1	0	4	0	3	4	1	18
Institutional outcome	3	0	0	3	1	0	1	11
Materials and cases	0	0	4	0	2	4	7	17
Motivations and attitudes	0	0	1	0	1	0	1	9
New awareness	2	0	4	1	2	3	0	16
New ideas for teaching	0	2	3	10	5	3	7	19
Occupational information	2	0	5	0	12	14	10	26
Personal life	0	0	0	0	1	0	0	6
Occupational knowledge and skills	13	13	15	4	20	16	13	27
Research ability	1	1	2	0	1	0	1	5
Value congruence	1	0	2	2	3	0	0	15
Participants for each activity category	19	16	16	15	25	24	19	

4.4 Discussion and conclusion

Our study provides a comprehensive understanding of vocational teachers' learning experiences in work placement. Learning goals, activities, and outcomes related to work placement were explored with semi-structured interviews. The connection between learning activities and outcomes was also revealed.

4.4.1 Learning activities in work placement

Our study identified seven learning activity categories of which teacher participants mostly employed combinations during work placement. Learning from others with and without interaction were the most frequent activity categories in which the participants engaged. These results illustrate that vocational teachers in the industry are always faced with rich formal and informal learning sources. In the review of Tynjälä (2008), learning in the workplace was divided into three modes: 1) incidental and informal learning, such as doing work; 2) intentional but informal learning, such as mentoring; and 3) formal training. These modes are entirely congruent with the results of the categories in our study but are less specific. Compared to the framework of teachers' learning activities in school workplace summarised by the review of Meirink, Meijer, and Verloop (2007), the categories of informal learning activities in work placement were almost the same, which means that teachers, no matter in a school or work context, would like to use similar ways to learn. Moreover, mentoring, formal training, and learning from others with interaction were more commonly conceived as important categories of activities by participants than others. All these three categories are linked to host organisations or stakeholders. It could be suggested that as beginners in the work context, teachers attach particular importance to the structured or non-structured support of others in host organisations.

4.4.2 Learning goals and outcomes toward work placement

Our study generated eight types of learning goals and twelve types of learning outcomes. Compared to the model of Harland and Kinder (2014), several categories in our study were developed or adapted to the context of work placement or the roles of vocational teachers, such as occupational information. The results of the categories of learning goals show that teachers prefer setting knowledge and skills instead of beliefs and attitudes as their learning goals in work placement, which is consistent

with the findings of teacher educators' self-initiated learning from Koster et al. (2008). In contrast to pedagogical knowledge and skills, teachers in our study selected occupational knowledge and skills as their goals more frequently. Previous studies have found that teachers' learning goals could be connected to their current professional concerns and learning conditions (Louws et al., 2017a; Louws et al., 2018). This can be used to explain our results: work placement is perceived by vocational teachers as a setting to prompt their occupational competence and, in addition, vocational teachers appear to be more concerned with their occupational knowledge and skills than their pedagogies for teaching. The latter can be connected with the findings from Schmidt (2019) in Australia, who found that industry currency was emphasised over pedagogical skills development. He explained that this was caused by the interpretation of the policies. Similarly, in China, a series of policies have been published to promote vocational teachers' occupational expertise in the past years, which may also increase teachers' awareness of its importance.

In contrast with the learning goals, the teacher participants' learning outcomes were more diverse. All types of knowledge and beliefs were perceived by the participants. Moreover, the findings from this study show that, according to the participating teachers, learning from work placement led to teachers' intentions to adapt classroom practice, make suggestions for colleagues, as well as develop school-company cooperation. This is an exploration of the components of impact on practice which is considered as the ultimate outcome in the model of Harland and Kinder (2014) and the classification can be supported by the model initiated by Clarke and Hollingsworth (2002), which acknowledges that the domain of practice for teacher professional growth is conceived as encompassing all forms of professional experimentation, rather than just classroom experimentation. In addition, occupational knowledge and skills and occupational information were reported as the most frequent types of outcomes, which were also considered as the main goals of the policymakers in China (Ministry of Education of the People's Republic of China, 2016).

4.4.3 The relationship between learning activities and outcomes

In previous studies, a quantitative approach has been used to examine the relationship between teachers' learning activities and outcomes (Bakkenes, Vermunt, & Wubbels, 2010; Hoekstra et al. 2009). Yet no research has been carried out in a way concerning

teachers' perceptions of the possible linkage. The findings of this study show that all the types of learning outcomes, except the ones concerning personal life, could be acquired from combinations of different activities. Additionally, learning from others (with or without interaction) and mentoring in the workplace were seen as the main learning activities that led to various learning outcomes and might be considered valuable activities that were almost consistent with teachers' perception of important activities. The learning sources of knowledge and skills were more frequently reported, while the linkage between beliefs and attitudes (such as motivational and attitudinal outcomes) and learning activities were seldom mentioned by the participants. A possible explanation could be that the outcomes of beliefs and attitudes are hard for teachers to perceive as the benefits from the specific activities.

4.4.4 Limitations and directions for future research

There are three limitations to our study which need to be addressed. Firstly, in our study, interviews with teachers to explore their perceived learning goals, activities, and outcomes in work placement were conducted only once. Future research could include observations or short interviews during the work placement to gain more comprehensive insights into teachers' professional development in this programme. Secondly, intentions for practice were employed to describe the school practice in our study, while the actual changes in school practice were still unclear. Therefore, future research could explore what real changes occur in vocational teachers' school practice after participation in work placement and what student achievements can be observed. Thirdly, we did not reveal the difference in learning goals, activities, and outcomes among teachers with different teaching and occupational experience and teaching domains because of the limited number of participants. Future studies could explore these differences in a larger sample.

4.4.5 Implications

The present study leads to some theoretical and practical implications. For the theoretical implication, to begin with, we explore teachers' professional development in work placement, a context which differs from the school workplace. The results on learning activities, goals, and outcomes in work placement enrich the existing insights on workplace learning and may inspire future researchers to explore vocational

teachers' learning in different contexts further. In addition, the model of Harland and Kinder (2014) was applied and found to be a useful model for the outcomes of teachers' professional development programmes. It has been adapted for learning from the work placement of teachers in vocational education. This might inspire scholars to employ and further develop this model in future research.

With respect to practical implications, the results of our study are useful for programme development in three ways. First, although work placement has been applied in several countries, it is still not available in many other countries. As the acquisition of outcomes has revealed the value of work placement for vocational teachers' professional development, policymakers and school leaders in more countries are recommended to import such a programme. However, this may be influenced by the types of vocational education systems. In the workplace-based or dual vocational education system, as students can obtain work-related knowledge and skills from the workplace, teachers may be more eager to develop their pedagogies than their vocational knowledge. Since vocational teachers need to have up-to-date occupational knowledge, work placement should be firstly encouraged in countries with a school-based vocational education system. Secondly, in the present study, various learning activities and their relationship with learning outcomes during work placement were identified, and support from host organisations was reported as being important for teachers' learning during work placement. Therefore, the designers of work placement can encourage vocational teachers to work on a combination of activities and should take into account how host organisations can provide support to vocational teachers. For the latter, to facilitate the engagement of host organisations during work placement, some financial support could be considered by the government. Thirdly, teachers' learning goals mostly included the acquisition of knowledge and skills and not adapting beliefs and attitudes. Teachers can get some guidance before participating in work placement to become aware of a larger variety of learning opportunities. For example, advisory or introductory meetings for teachers can be set up or prior participants can be invited to share their learning experience with teachers.

Chapter 5

Factors influencing the impact of work placement on vocational teachers' school practice

This chapter is an adapted version of
Zhou, N., Tigelaar, D. E., & Admiraal, W. (2022). Factors influencing the impact of work placement on vocational teachers' school practice. *Educational Studies*, 1-20. https://doi.org/10.1080/03055698.2022.2069462

Abstract

Work placement is defined as a continuing professional development programme aiming at improving vocational teachers' understanding of industry working life through authentic experience. It has been a mandatory programme for all vocational teachers in China since 2016. In this study, we explore the impact of work placement on vocational teachers' practice in school and probe into the factors that facilitate or hinder its impact. The participants were 18 Chinese secondary vocational teachers who were interviewed twice: one week after their work placement and after five months. Six categories of intended and actual changes of teachers' practice were identified, which were grouped into three levels including the school, collegial, and individual classroom practice. Moreover, thirteen facilitating or hindering factors have been clarified, which were divided into three clusters consisting of the teacher characteristics, work placement, and school environment. Limitations and practical implications are discussed.

5.1 Introduction

As contemporary working life changes rapidly, vocational teachers are supposed to follow what is happening in the industry or society and relate it to their practice in school (Andersson & Köpsén, 2018; Dymock & Tyler, 2018). To maintain in-service vocational teachers' work-life competence and its integration into their school practice, work placement has been designed and implemented in several countries, such as England, Sweden, France, and China, using different labels, like industry release in Australia and extended work placement in France (Lloyd & Payne, 2012; Zaid & Champy-Remoussenard, 2015). It is deemed as an important component of 'vocational teacher professional development' which consists of the development of vocational teachers' professional knowledge/skills and attitudes/beliefs with regards to pedagogy and vocational subjects, and even their awareness of the dual identity of being teachers and professionals at the same time (Andersson & Köpsén, 2015; Fejes & Köpsén, 2014). It emphasises vocational teachers' professional expertise in a particular vocational area. In the research of Andersson and Köpsén (2015), work placement is defined as a programme in which vocational teachers acquire occupational knowledge and skills through participating in 'the vocational, work-life community of practice of their teaching subject' (p.2). The values of this programme have been indicated in recent studies, such as enabling vocational teachers to learn through crossing boundaries between school and work-life organisations (Andersson & Köpsén, 2015; Köpsén & Andersson, 2017).

At present, work placement has been one of the most important and common programmes for vocational teachers' professional development in China. All vocational teachers are required to undertake work placement for at least one month annually and six months within each five-year period (Ministry of Education of the People's Republic of China, 2016; The State Council of the People's Republic of China, 2019). During the past years, the Chinese government, school leaders, and vocational teachers, in particular, have invested a lot in the process of work placement. For instance, the government provides financial support for vocational teachers to attend work placement and tax benefits for companies to engage in organising this programme (Ministry of Education of the People's Republic of China, 2016). In addition, an increasing number of vocational teachers sacrifice their break time for attending work placement. However, the impact of work placement on teachers' practice in school is still unclear (Hao, 2019). In particular, empirical research is

lacking. Therefore, in the present study, we investigate the changes in vocational teachers' practice in school resulting from work placement and the factors that influence them to actualise these changes. The findings aim to contribute to a comprehensive understanding of how vocational teachers' learning experiences with work placement support their practice in school and help policymakers and school leaders to facilitate teachers' application of learning from work placement in their school workplace.

5.1.1 The descriptions of work placement in Chinese vocational education

5.1.1.1 Why work placement is implemented nationwide in China

The reason for implementing work placement in China is located in the high demand for vocational teachers' occupational competence. It is also reflected in the latest reform document of vocational education, which requires that a person is supposed to have at least three-year occupational experience before becoming a vocational teacher (Ministry of Education of the People's Republic of China et al., 2019a). Vocational education in China is typically school-based, despite an increasing opportunity for vocational students to do an internship in their final year. This means that vocational students spend most of their time at school sites instead of the workplace, and they usually develop their work-related knowledge and skills with the guidance of vocational teachers in school (Barabasch, Huang, & Lawson, 2009). Therefore, the curricula are normally designed as syntheses of theoretical and practical modules in which vocational teachers have to fulfil different roles simultaneously, such as those of lecturer, mentor, and career instructor.

In this context, the concept of 'Dual qualified teachers' has been imported into Chinese vocational education, which means that vocational teachers are supposed to keep dual competencies and identities pertaining to 'teaching' and 'work' (The State Council of the People's Republic of China, 2005). As much knowledge of working life is developed through occupational practice (Andersson & Köpsén, 2018), to improve vocational teachers' occupational expertise, work placement has been implemented nationwide in line with the regulations of the Chinese government.

5.1.1.2 How vocational teachers learn in work placement

To stimulate vocational teachers to attend work placement, an increasing number of school leaders set out to seek feasible companies for their teachers. Also, the Chinese

government published a list of companies able to provide work placement for vocational teachers (Ministry of Education of the People's Republic of China et al., 2019b). Usually, vocational teachers attend work placement during their summer or winter break, which is due to the shortage of replacement teachers in schools (Hao, 2021).

During work placement, vocational teachers are faced with various formal and informal learning opportunities, which depend on the setting of work organisations, on the one hand, and teachers' preferences, on the other hand. Findings from Zhou, Tigelaar, and Admiraal (2021) indicate that vocational teachers' formal learning activities in work placement include attending regular training organised by companies and being mentored in working life, while informal learning activities consist of doing daily work as an employee, trying out new technologies or work methods, reflecting on these experiences, talking with other actors (colleagues, supervisors, clients) from work-life communities, and learning from other objects, such as work manuals. Among these activities, talking with others is the most common learning activity for vocational teachers during work placement.

5.1.2 The impact of learning experience on teachers' school practice

Teaching practice is an influencial factor for ensuring student achievements (Chaaban, 2017; Kilinc, Bellibas, & Polatcan, 2020). As illustrated in the interconnected model of professional growth developed by Clarke and Hollingsworth (2002), the domain of practice (professional experimentation) could be led by the external domain (external source of information or stimulus) through enactment. In our context, work placement can be seen as an external domain, which provides vocational teachers with new occupational knowledge and information, and vocational teachers' changes in school practice might come out of it.

5.1.2.1 Teachers' changes in school practice

Teachers' changes in practice are related to a variety of forms. In their interconnected model of professional growth, Clarke and Hollingsworth (2002) approach forms of practice as 'the domain of practice that is conceived as encompassing all forms of professional experimentation, rather than just classroom experimentation' (p. 950). Still, most previous studies have concentrated on teachers' classroom practice, while neglecting other possible changes in practice within school. For example, Ke, Yin, and Huang (2019) found that teachers' participation in school-based professional

development could only facilitate their adoption of desirable teaching strategies. As work placement is a work-related programme that is not merely focused on a specific topic of pedagogy, vocational teachers' transfer of it to school could show quite diverse practices.

In addition, previous research has mostly employed either teachers' intended changes or teachers' actual changes in practice resulting from learning experiences, with an assumption that teachers' intentions for practice align with their actual practice. Nevertheless, there is increasing evidence that inconsistencies often exist between teachers' intended changes and their actual changes in practice. Bakkenes, Vermunt, and Wubbels (2010) explored experienced teachers' learning outcomes in the context of educational innovation and found that teachers' intentions for practice (i.e., intentions to try new practice) were frequently reported by the participants, while actual changes of their practice (i.e., new practice) were seldomly recognised. These authors argued that a possible explanation of this gap could be that for actualising behavioural changes, a longer time span is needed. Furthermore, other researchers argue that teachers have spontaneous or unconscious growth processes, but, such growth might take several years or even decades (Zhao, 2010). As work placement is totally different from teachers' work context, vocational teachers may encounter obstacles while seeking to apply in school what they intended to change after work placement. Also, they might have some spontaneous changes which are not planned in their mind. Thereby, we argue, a good way to gain a comprehensive understanding of teachers' changes in practice is to consider both their intended and actual changes in practice.

5.1.2.2 Factors facilitating or hindering teachers' changes in practice

In this section, we would like to review the prior research on influencing factors and models of teacher change and conclude the limitations. Concretely, although teachers might always expect that their learning experiences could support their practice in school, various factors have been examined, which may facilitate or hinder teachers in making use of their learning experiences. For example, Chaaban (2017) identified five barriers that prevented English teachers from implementing the issues learned from school-based support programs in their classrooms, respectively time restraints, prescribed curriculum pacing, classroom management issues, students' limited language abilities, and general resistance to change. However, we found from the prior literature that first, the factors varied with different teacher learning activities or

programmes. Second, many studies only focus on a particular aspect, such as programme design or work environment. And third, there is no research on the factors influencing vocational teachers to actualise changes in practice. Thus, in the context of work placement, a particular programme for vocational teachers which is organised in the industry, we infer that the influencing factors might differ from those identified in previous studies, which focused on different specific learning activities or perspectives.

To understand the factors influencing teachers to perform changes in practice, the conceptual framework of teachers' professional learning and development initiated by Opfer and Pedder (2011) can be employed. Opfer and Pedder (2011) categorised the factors influencing teachers' professional learning into three subsystems, consisting of the individual, school-level, and learning activity. Each subsystem includes a few factors. For example, the individual system consists of prior experience, individual beliefs, and knowledge. Yet, the concept of professional learning in the research of Opfer and Pedder (2011) refers to the whole learning process and teacher change is only a stage of this process, which means the factors generated in their research are too general to be used to explain teacher change in vocational teaching. Another way to comprehend the factors that influence teachers to implement the changes in practice is from the perspective of transfer of learning (Dreer, Dietrich, & Kracke, 2017). Making changes in practice after learning experiences can be understood as transferring what teachers have learned to their workplace in school. As shown in Figure 5.1, the factors affecting individuals' transfer of learning have commonly been classified into three domains, including learner characteristics, intervention design, and work environment (Blume et al., 2010; De Rijdt et al., 2013). This classification is similar to that of Opfer and Pedder (2011) regarding teacher professional learning in general. Compared to professional learning, the transfer of learning seems to be more centred on the usage of learning experience and changes in practice. Nevertheless, the factors in the prior model of transfer of learning are derived from human resource management instead of the field of teacher professional development. Therefore, the factors may need to be adapted to the context of teacher professional development, including work placement.

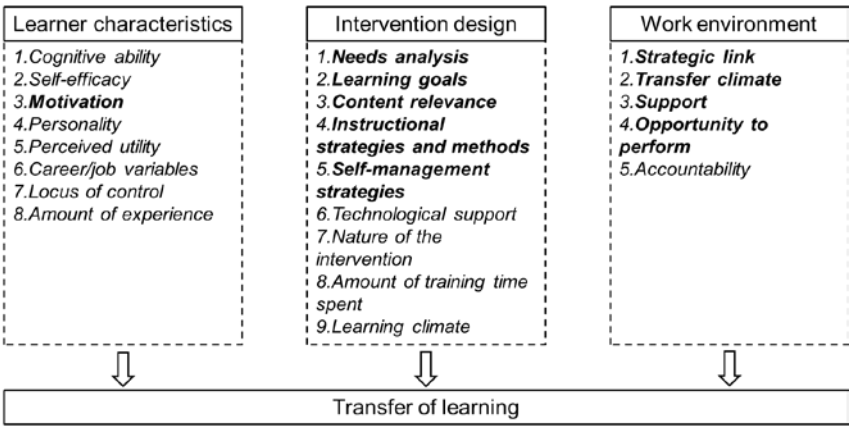

Figure 5.1 The adapted conceptual framework of the variables influencing transfer of learning in staff development interventions. *Note: Bold indicates the factors influencing staff's transfer of learning in higher education* (Based on De Rijdt et al., 2013).

5.1.3 Our study

To address the limitations mentioned above and to obtain an in-depth understanding of vocational teachers' professional development during work placement, our study is focused on investigating vocational teachers' changes in school practice and possible factors in the context of work placement that influence them to implement changes in their school practice. Therefore, the following two research questions directed this study:

RQ1. What are vocational teachers' intended and actual changes in their school practice based on work placement?

RQ2. What factors do vocational teachers perceive as facilitating or hindering for implementing their changes in school practice?

5.2 Method

5.2.1 Participants

The data for this study was collected from a sample of 18 secondary vocational teachers (12 females and 6 males). All participants undertook work placement for at least one month during the summer break of 2020. Their average teaching experience in years was 9.39. Moreover, there were only five participants who had occupational

experience before becoming a teacher. The participants were from various teaching subjects, such as accounting, marketing and e-commerce. Since many participants taught more than one subject, we show teaching domain instead of subjects for each participant (shown in Table 5.1). During this work placement, they learned through doing routine work as an employee, talking with other employee colleagues, trying out and reflection, being mentored, or attending formal training organised by the companies. It was explained to participants that participation was voluntary, and that the data would be kept confidential and would only be available for research purposes. The current study received ethical approval from ICLON Research Ethics Committee with the number IREC_ICLON 2020-06.

Table 5.1 Participants' information.

Num	Name	Gender	Teaching domain	Teaching experience (Years)	Occupational experience (Yes/No)
1	Alice	Female	Agriculture information	2	No
2	Barbara	Female	Accounting	24	No
3	Calvin	Male	Automobile beauty	14	No
4	Grace	Female	Engine inspection and maintenance	4	No
5	Harry	Male	Electric control	6	No
6	Kristin	Female	Marketing and e-commerce	3	No
7	Maria	Female	Computer application	21	No
8	Mike	Male	Welding	1	Yes, 18 years
9	Peter	Male	Internet of things technology	3	Yes, 1 year
10	Rose	Female	Graphic design	7	No
11	Sara	Female	Package design	12	No
12	Wendy	Female	Architectural working drawing	4	Yes, 2 years
13	Steven	Male	Mould manufacturing and design	15	No
14	Tina	Female	Construction project budget	16	No
15	Tom	Male	Digital controlled lathe	18	No
16	Penny	Female	Nursing gerontology	3	Yes, 2 years
17	Mona	Female	New media	1	Yes, 1 year
18	Nydia	Female	Digital media	15	No

5.2.2 Data collection

5.2.2.1 Procedures

To track vocational teachers' intended and actual changes in their practice in school since participation in work placement, the participants were individually interviewed twice by the first author, online via WeChat. The first-round interviews were carried out within one week after completing work placement, while the second-round interviews were conducted at the end of the semester following work placement. The time of interval was approximately five months. Although a total of 27 participants were involved in the first-round interviews, nine of them did not participate in the following round for a variety of reasons, such as time constraints. Thereby, 18 participants who participated in both interviews were finally included in our study. The average time for each interview was around 45 minutes in the first round and 35 minutes in the second round, respectively. All interviews were audio taped and transcribed verbatim with permission from the interviewees. After the interviews, each transcript was sent back to the interviewees with a request to respond to the first author concerning whether it was accurate. All their responses were positive, which means that there were no revisions or additions needed for the transcripts.

5.2.2.2 Semi-structured interview

In the first-round interviews, participants who just completed work placement were asked to talk about what they would plan to change their practice in school in the coming semester (see Appendix C for the interview outline). To begin with, they were invited to introduce themselves, including their teaching domain and teaching experience. Second, they were requested to share their learning experience with work placement (i.e., 'Could you please introduce your experience with this work placement you just completed?'. Third, they were directed to the focus on intended changes. For this, several questions were employed, i.e., 'How do you think this learning experience with work placement will influence your school practice?' and 'What changes do you expect to occur in your practice?'. In the second-round interviews, there were two main themes questioned (see Appendix D for the interview outline). The first theme was focused on the participants' actual changes in their school practice (i.e., 'Do you think your last experience with work placement was useful for your practice this semester?', 'Could you elaborate a little why you think it

was useful? Also, were there any changes in your practice due to this work placement?', and 'You mentioned that you would like to change XX at last time interview, did you perform it in the past semester?'). The second theme was related to possible factors which facilitated or hindered the participants in making changes (i.e., 'What factors do you think facilitated you to implement these changes?' and 'What factors do you think hindered you to implement these changes?').

5.2.3 Coding procedure and analysis

To answer the first research question, the two interview transcripts of each participant were coded and analysed. To begin with, the fragments of the first transcripts relating to teachers' planned changes in their school practice were labelled. Next, the labels were merged into categories based on the main issues that teachers would like to perform. There were six categories generated (adapting teaching content, and so on). Then, the categories were clustered into the levels of school, collegial, and individual classroom practice. Additionally, to check the inter-rater reliabilities, an independent researcher coded four transcripts independently by using the ultimate categories for changes in practice. The Cohen's kappa with a 95% confidence interval was 0.91, which indicated that the results of the categories had high reliability. Subsequently, these levels and categories were applied as a coding scheme to guide the coding procedure of the transcripts of the second-round interviews (shown in Table 5.2). All fragments relevant to teachers' actual changes were coded and put into the specified categories. In addition, to describe the difference between the intended and actual changes of teachers' practice, the frequencies of the six categories from two transcripts were counted.

Table 5.2 Coding scheme of teachers' changes in practice

Level	Category	Description
School	School development	Taking actions for improving study programs or developing school-enterprise cooperation
Collegial	Teacher collaboration	Sharing the issues learned from work placement with colleagues or make suggestions for colleagues' teaching practice with work placement experience
Individual classroom practice	Adapting teaching content	Introducing the newly acquired teaching content or restructuring the current teaching content
	Enriching teaching resources	Importing the resources obtained from working life in class
	Providing career guidance	Offering working life information or career advice to vocational students
	Organizing competence-based activities or setting	Designing some activities or settings to develop vocational students' occupational competence

With regard to the second research question, all the second-round interview transcripts were coded and analysed with the guidance of the general conceptual model on transfer of learning. Firstly, the fragments were coded into the following three domains of influencing factors: (1) Teacher characteristics; (2) Work placement; (3) School environment. Secondly, based on the constructs of the model on the transfer of learning, the categories were extracted and generated within each domain. To ensure the reliability of the results, after building the preliminary categories by the first author, multi-round discussions were conducted by all the authors to adjust and adapt the categories. The discussions were focused on three questions: 'Whether the categories were labelled appropriately?', 'Whether some of these categories should be merged?', and 'Whether these categories fit well with the domains?' After that, five categories in the domain of teacher characteristics, three categories in the domain of work placement, and five categories in the domain of school environment were identified. To further reveal how teachers perceive these categories, the categories were further specified in terms of either being facilitating or hindering ones based on the views of most participants. For example, there were seven vocational teachers who talked about transfer self-efficacy. Among them, five teachers believed that low

transfer self-efficacy inhibited their changes in practice. Thus, low transfer self-efficacy was identified as a hindering factor. In the end, five facilitating factors and eight hindering factors were distinguished.

5.3 Results

5.3.1 The impact of work placement on vocational teachers' school practice

Based on the interview data analysis, three levels, including six categories of teachers' changes in practice have been distinguished (Table 5.3). Overall, the participants reported impact at the level of individual classroom practice more frequently than at the other two levels (Table 5.4).

Table 5.3 The description of changes in practice on three levels

	School level	**Collegial level**	**Individual level**
Focus	Developing school educational standards or new curriculum, Promoting the school-company cooperation	Sharing work placement experience with colleagues	Adapting teaching content, Enriching teaching resources, Providing career guidance, Organising competence-based activities or setting
Purpose	Improving school education	Improving collective occupational expertise or teaching practice	Improving individual teaching and student outcomes
Stakeholders	School, Companies	Teacher colleagues	Students
Context	--	Small talk or Jiaoyanzu	Class

Table 5.4 The level and categories of changes in practice with the number of participants reported (n=18).

Level	Category	Number of participants with intended changes	Number of participants with actual changes
School	School development	4	1
Collegial	Teacher collaboration	4	10
Individual classroom practice	Adapting teaching content	12	14
	Enriching teaching resources	10	12
	Providing career guidance	10	15
	Organising competence-based activities or setting	9	9

5.3.1.1 School level

The participants, particularly those who had the role of administrators or team leaders, reported that they can make use of their learning experience with work placement to contribute to school development. This is reflected in two ways, first, some of the participants mentioned that through work placement, they better understood what was happening in working life and experienced a gap between vocational education and working life. This gap prompted them to take measures or make suggestions for improving educational standards of study programs or developing new curricula. For example, an accounting teacher who is also a team leader illustrated:

> ‘From work placement, I found that much accounting work has been undertaken through computer programming, which means there is a higher requirement for students’ digital competence. Thereby, some new curriculums, such as on Python programming, will be developed and added to our current study program after I come back to school.’ (Cara, 21 August 2020)

Second, several participants reported that after work placement they strived to develop cooperation between the enterprises and their vocational schools to improve the quality of school education. Teacher Nydia indicated that with her efforts, the company she stayed in during work placement would reach an agreement with her school to provide more opportunities for students’ internships or practice. Although

four participants planned to work for school development with their experience of work placement, only one participant actually realised that, which means that the impact of work placement on vocational teachers' changes for school development seems difficult to achieve. Based on the explanation of the other three participants, the reason why they did not work on school development was that they could not get much support from their school leaders for application, such as no empowerment to develop a new curriculum.

5.3.1.2 Collegial level

At the collegial level, some participants reported they shared what they learned from work placement with colleagues to improve their occupational expertise or teaching practice. As a participant with 18 years of teaching experience said:

> 'I learned a lot related to 3D printing during work placement. After going back to school, I can talk with my colleagues who taught 3D printing. I often offer some suggestions for how to improve their class based on what I have learned. Sometimes they accept my suggestions and adapt their teaching practice.' (Tom, 11 January 2021)

The main way that the participants shared work placement experiences with their colleagues was described as informal, such as through 'small talk'. However, sometimes the participants also shared their experiences on formal occasions, such as Jiaoyanzu, a formal activity in which teachers learn together.

During the first-round interviews, four participants mentioned that they would like to share what they have learned from work placement with their colleagues to support their teaching practice. All four of them did so during the last semester. In addition, six other participants also shared their experiences with colleagues. They interpreted that it naturally occurs when they talk about relevant topics during 'small talk'.

5.3.1.3 Individual classroom practice level

Adapting teaching content. More than half of the participants indicated that they applied their newly acquired knowledge and skills or restructured their previous knowledge and skills within both their theoretical and practical teaching modules. Some participants claimed that importing the latest working life knowledge and skills obtained from work placement enriched their classroom practice. This is further explained by a participant:

> ‘I used to teach my students how to produce a mechanical part in a traditional way. Now I can tell them how to use metal printing technology since I learned 3D printing from work placement. Although my students can’t experience it, I can help them to know the most advanced processing methods in industries.’ (Tom, 11 January 2021)

Several participants mentioned that on the basis of their learning experiences from work placement, they highlighted the important issues related to work and removed some aspects that were less related to work. A participant described this experience:

> ‘I considered manual plotting a traditional and important skill in architecture and believed that it wouldn’t be removed from my class. However, during work placement, I found that electronic plotting has been applied so widely and maybe manual plotting is not as important as I thought. Therefore, I try to reduce the content related to manual plotting this semester.’ (Wendy, 14 January 2021)

Overall, twelve participants intended to adapt their teaching content, and all of them as well as two other participants actually realised these changes. Some of them explained further that this is the most significant change of their teaching practice.

Enriching teaching resources. Enriching teaching resources was mentioned as one of the most common changes in vocational teachers’ classroom practice. It refers to teachers bringing plenty of new materials (such as cases, videos, pictures, manuals) received from work placement to their classroom practice. These materials support vocational teachers in explaining some knowledge more clearly. For example, participant Grace applied a video of automobile repairing she got from work placement to explain to her students the key points of repairing automobiles. These materials also make teachers’ classroom practice more connected to the real world of work, which facilitates their students’ understanding of industry working life. A participant noted:

> ‘In my class, I need to make students design web pages on computers. As I get many pages designed by that company during work placement, I could introduce them to my class and let students use them to practice. This could make a better impression.’ (Maria, 22 January 2021)

In the first-round interviews, ten participants indicated that they planned to apply working life resources to their practice in school. Yet, in the second-round interviews, two of them noted that they did not implement new materials because they had no time to prepare before class but four other participants did it because they found it was very relevant to their teaching.

Providing career guidance. Vocational teachers also talked about how they provided career information acquired from work placement to their students or offered some career advice for students based on their work placement experience. Career information is related to students' concerns for their future career choice and development, such as salaries and welfare, competence requirements from work organisations, and career development paths. A participant told her students some new career information after coming back to school:

> 'If you would like to go to auto repair shops after graduation, you are supposed to know that the work environment won't be good and your wages at the beginning will be very low, maybe only around 2000 RMB. You need time to improve yourself and keep the spirit of hard work.' (Grace, 18 January 2021)

During the second-round interviews, apart from those ten participants who planned to provide career information or guidance to their students, five other participants mentioned that they had changed their classroom practice and included career information. Although they did not intend to utilise this career information when completing work placement, the interest in future careers from their students stimulated them to use it after going back to teaching.

Organising competence-based activities or settings. Some vocational teachers reported some activities or settings to develop students' career competence in their classroom practice. During work placement, they perceived the importance of some occupational competences, such as operational skills, communication skills, and teamwork competence. To improve students' operational skills, they liked to provide their students with more opportunities to practise, as the following participants said:

> ‘I reallocate the time spent in theoretical and practical modules, and I give students more time to practise this semester.’ (Grace, 18 January 2021)

> ‘I would like to select several students with high operational skills and encourage them to attend practical competitions.’ (Harry, 14 January 2021)

To improve students’ other occupational competencies, some activities were designed and applied, as a participant stated:

> ‘During work placement, I found that communication skill is so important. Thereby, I asked my students to conduct personal presentations to cultivate their speaking ability this semester.’ (Nydia, 16 January 2021)

Nine participants intended as well as realised to organise competence-based activities. Although they explained it was hard to achieve, they believed that it was valuable for students’ development of their occupational competence.

5.3.2 The factors influencing the impact of work placement on teachers’ practice

Through qualitative analysis, thirteen factors influencing vocational teachers’ changes in practice led by work placement were generated. These factors were clustered into three domains: teacher characteristics, work placement, and school environment. Five factors were indicated as facilitating factors and eight factors were ascertained as hindering factors. Most facilitating factors originated from the domain of teacher characteristics, whereas most hindering factors were derived from the domain of work placement and school environment.

5.3.2.1 Teacher characteristics

Teacher characteristics refer to teachers’ experiences, personalities, and beliefs. Three facilitating factors (high motivation to transfer, perceived utility, and perceived effect) and two hindering factors (low transfer self-efficacy and amount of experience) have been identified. In general, all teacher characteristics factors in our study were connected with vocational teachers’ cognitive perceptions except for the amount of

experience, but addressed different perspectives of learning or transferring. Specifically, seven participants mentioned high motivation to transfer, which refers to a high desire of teachers to share, apply or transfer what they have acquired from work placement to their workplace of school. For example, participant Wendy attributed her main changes in practice to her motivation to transfer: 'If I don't apply what I have got from work placement to my classroom, I feel that I'm not responsible for my students'. Another facilitating factor mentioned was high perceived utility, which means that learning from work placement, also transferring from work placement are perceived as useful for teachers' practice in school. This enriches the previous description of perceived utility, which only addresses the value of learning programmes (De Rijdt et al. 2013). Several participants' mentioned changes in practice that were based on the perceptions of high utility. This is further explained by a participant:

> 'The cases obtained from work placement are very useful. Students could be more impressed with them than the cases from the textbooks. Based on these cases, I could tell my students more things related to working life.' (Maria, 22 January 2021)

The last facilitating factor reported was the high perceived effect, which addresses teachers' perceptions of the positive results of making changes. When the participants recognised the effects of their changes in their school workplace and found that the problems of their previous teaching were fixed, they would prefer deepening them. A participant described her process of changing as follows:

> 'In my previous lessons, I required my students to carry out tasks step by step under my guidance, and I found that their thoughts were restrained, and they were not able to understand my guidance well. During the work placement, I found that there was a high requirement for employees' independence. They should do tasks and learn anything by themselves…Therefore, this semester, I give them more opportunities to explore by themselves instead of teaching them to step by step. I found it's effective and I will think about how to improve it.' (Mona, 19 January 2021)

Next to the facilitating factors, two hindering factors have been distinguished: low transfer self-efficacy and low teaching experience. Transfer self-efficacy refers to

teachers' general beliefs about their ability to apply what they learned from work placement in practice. Participant Kristin articulated the low transfer self-efficacy as 'I feel not confident in sharing those issues learned from work placement with my students'. Some of the participants indicated that if they were not competent for utilising what they acquired from work placement to their school workplace, they wouldn't easily try them out. Moreover, low teaching experience was mentioned by two novice teachers as a hindering factor. They stated that compared to experienced teachers, they had limited teaching or work placement experience, which resulted in fewer changes in practice. As a participant reported:

> 'I'm a novice teacher, who doesn't have much experience of work placement. I should have learned more but I didn't. Therefore, in this semester, I can't apply much to my teaching practice.' (Mona, 19 January 2021)

5.3.2.2 Work placement

Three factors were identified as work placement factors in our study, of which clear learning goals were regarded as a facilitating factor, whereas the short duration of work placement and low content relevance were seen as the hindering factors. With respect to clear learning goals, vocational teachers who set specific and clear goals before or during work placement with the support of companies possibly made more use of their learning experience to implement changes in their school practice. This is different from the explanation of the prior model, which concerned whether learning goals were explicitly communicated in the process of programme design (Blume et al. 2010; De Rijdt et al. 2013). However, this factor was mentioned by only one participant:

> 'I have several specific concerns related to my class when attending work placement, such as getting the information of the competence requirements for employment…So I could bring them to my class.' (Rose, 25 January 2021)

The short duration of placement was regarded as a hindering factor. The participants who mentioned it in our study often complained that the period of work placement was too short, which impeded their learning opportunities and application in teaching practice. This is formulated by a participant as follows:

> 'The work placement is quite short, only two months. And when I was in working life, there was no feasible project to follow. I just did some minor work. Therefore, I can't bring much to my class.' (Tina, 25 January 2021)

Another hindering factor was narrow content relevance, which means that what vocational teachers have learned from work placement is not quite relevant to their curriculum. A participant reported as follows:

> 'There is an important reason that I don't introduce this to my class. It is not relevant to the exams. Even when I teach it to my students, it won't be tested in the final exam.' (Maria, 22 January 2021)

5.3.2.3 School environment

School environment factors highlight the barriers or facilitators situated in the context of the vocational teachers' workplace of school. We distinguish one facilitating factor (students' high interests) and four hindering factors (teachers' heavy workload, disruption of prescribed teaching pacing, students' unreadiness, and insufficient school support), and most of them were hardly identified in previous models or studies. Students' keen interests were frequently reported as a facilitating factor for the participants to make or retain changes in their classroom after work placement. As a participant reported:

> 'If I talk about something that I obtained from work placement, my students always have many questions, such as how did you do it there…The more questions my students ask, more I can talk.' (Kristin, 25 January 2021)

Regarding the hindering factors, vocational teachers' high workload is considered an important one. The workload indicates not only teachers' existing amount of work, but also their possible workload of preparation for making changes in their classroom. Five participants complained that the heavy workload prevented them from thinking about applying what they learned in their classroom. Two participants mentioned that they were afraid that making changes in their class needed much preparation, which can increase their workload. Several participants further illustrated that they would like to change their school practice gradually in the following semesters instead of completely in the current one, as otherwise, the workload would increase. Another

hindering factor mentioned by one participant is the disruption of prescribed teaching pacing, which describes that the timelines of teaching are disordered because of making changes in the classroom. For example, this participant reported:

> 'My schedule for teaching this chapter is 4 class-hour periods. However, when I added some issues that I obtained from work placement to my class, I found I needed around 5 class-hour periods to complete this chapter. This could be a barrier.' (Peter, 12 January 2021)

Besides, students' unreadiness was also conceived as a hindering factor for vocational teachers' changes in practice. It means that students are not ready yet for teachers' changes in class, which can be observed from several quotations. First, some of the participants noted that, considering the lower performance and learning ability of vocational students than students in general secondary education, they waive some changes as those might be a bit difficult for students to understand. This is particularly the case for low-grade levels. Second, several participants posited that students' choices for the future influenced them to apply what they learned from work placement to their classroom. Participant Steven explained that most students in his class would step into college instead of working life after graduation and, therefore, he believed it was not necessary to share much work-related skills and information with his students, even if he acquired a lot from work placement.

Moreover, insufficient school support was considered an important hindering factor at the school level. It refers to a lack of support that schools provide for vocational teachers, such as work-related equipment, opportunity to use. Some participants reported that the lack of school resources impeded them from applying what they obtained from work placement to their classroom. This is further explained by a participant:

> 'During work placement, I learned how to use some advanced accounting software, such as T+. However, our school didn't buy this software and we still use T3 to teach students. Therefore, although T+ is more progressive and updated, I can't teach my students how to use it.' (Barbara, 23 January 2021)

5.4 Discussion

This study is focused on exploring the perceived impact of work placement on

vocational teachers' practice in school and the factors that can influence its impact. Based on the analyses, six types of desired and actual changes at three levels were outlined and thirteen influencing factors linked to three domains were recognised.

5.4.1 Vocational teachers' changes in school practice resulting from work placement

In this study, vocational teachers' changes of practice inspired by work placement were observed at three levels, including the school, collegial, and individual classroom practice. This suggests that vocational teachers' learning experiences with work placement not only prompt them to make adaptions to their classroom practice, but also drive them to take action with regard to the development of their school and colleague group. This finding extends research that professional development can merely contribute to the changes in teachers' instructional practice. It is also supported by the model initiated by Guskey (2002), acknowledging that organisational support and change are indispensable components when it comes to evaluating teachers' professional development.

At the school level, several vocational teachers planned changes for school development, such as improving educational standards, while only one teacher achieved them. A possible explanation for this difference is that planned changes at the school level cannot be conducted by teachers without support from school leaders or other school personnel. Previous literature already revealed that school leaders' ongoing leadership is vital for supporting teacher change (Whitworth & Chiu, 2015). This means that school leaders could do more to create a facilitating environment for supporting teachers to implement changes in their practice. At the collegial level, we found that several vocational teachers intended to share their experiences from work placement with their colleagues to improve the collective teaching practice and actually did it through 'small talk'. In the school workplace, vocational teachers have plenty of opportunities to interact with their colleagues. Informal interactions, in particular, could promote teachers' sharing with their colleagues.

Concerning teachers' classroom practice, four types of changes were mentioned, respectively adapting teaching content, enriching teaching resources, providing career guidance, and organising competence-based activities. The first three were more

frequently performed by vocational teachers than the last one, possibly because the latter one is perceived as being more complex. Moreover, the comparison between the intended and actual changes showed that most vocational teachers indeed implemented their planned changes, but also that several teachers carried out changes that were not planned beforehand. In earlier research, it has been found that teachers' behaviours could be reflexive and spontaneous, which implies that teachers' behavioural change can also occur without planning (Cole, 1989). From these findings, it can be further inferred that teachers' changes in practice in relation to learning programmes are sometimes difficult to predict.

5.4.2 Factors influencing the impact of work placement on teachers' practice

The findings from this study also revealed facilitating or hindering factors with regard to vocational teachers' implementation of their changes in practice after work placement (as shown in Figure 5.2). These factors were clustered into three domains, i.e., teacher characteristics, involving teachers' beliefs, personalities, and experiences; work placement, which is focused on the characteristics of the process of work placement; and school environment, containing teachers' workplace conditions. This classification aligns with the available theoretical models on the transfer of learning in the area of staff development (Blume et al., 2010; De Rijdt et al., 2013) and teacher professional learning of Opfer and Pedder (2011). It is apparent that the results from the current study give rise to building an adapted model of the factors influencing the impact of vocational teachers' learning experiences with work placement that lead to changes in their practice. In particular, we identified the attribute of these factors with respect to facilitating or hindering, which is helpful to observe the influence of these factors.

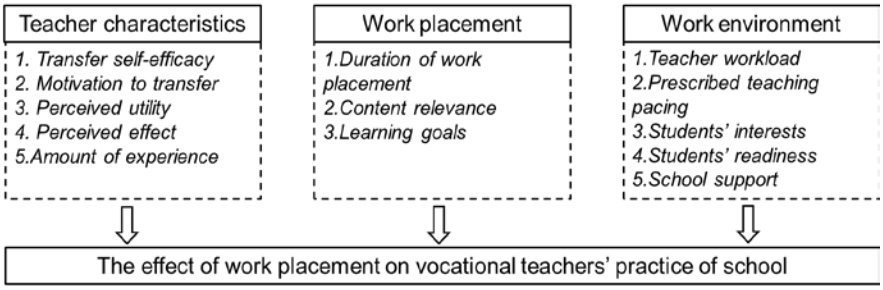

Figure. 5.2 Factors influencing the impact of work placement on vocational teachers' changes in their school practice

Regarding the domain of teacher characteristics, vocational teachers' high motivation to transfer, perceived utility, and perceived effect were reported as facilitating factors for transferring their learning from work placement to their school workplace, while low transfer self-efficacy and low teaching experience were illustrated as hindering ones. Amongst these factors, teachers' motivation to transfer, perceived utility, and transfer self-efficacy have been explored in previous literature (Dreer, Dietrich, & Kracke, 2017). In addition, teachers' levels of experience are involved in the existing conceptual model on the transfer of learning, but have seldom been explored (De Rijdt et al., 2013). Thus, this study could provide empirical evidence of its influence on teachers' changes in practice. Moreover, teachers' perceived effect is a newly identified factor derived from the current study, which provides another possible prediction of teachers' changes in practice: teachers would like to continue or deepen their changes when they perceive the positive effects of their changes. We have identified a few factors related to teacher characteristics, but some other factors from previous studies, such as personality, were not examined in our study.

Concerning the domain of work placement, the duration of work placement, content relevance, and learning goals were included. The first two factors can be considered the common characteristics of effective learning programmes (Hubers, Endedijk, & Van Veen, 2020; Smith & Gillespie, 2007). Besides, learning goals are seen as a facilitating factor for teachers' changes in practice. It is worth noticing that the factor of learning goals does not refer to whether work placement provides explicit objectives, but addresses the extent to which teachers are able to set explicit learning goals for work placement. In the previous model of transfer (De Rijdt et al., 2013), the number of factors in the domain of intervention was the highest, whereas it was

the lowest in our study. The reason may be that the factors of intervention characteristics are more associated with the organisation of companies and schools and that teachers preferred talking about themselves.

The domain of school environment factors is associated with teachers' work-related context. Teacher workload, prescribed teaching pacing, students' interests and readiness, and school support were grouped into this domain. The high workload of teachers and the disruption of prescribed teaching pacing seem to inhibit their changes in practice. Insufficient school support can also play a negative role when it comes to supporting teachers to make changes. In addition, in our study, it was found that students' high interests stimulated vocational teachers to remain or deepen changes, whereas students' low readiness impeded teachers to make or keep changes. Although student factors have been seldom explored in previous research, they are verified as important influencing factors in this study.

Moreover, the explanation we provided for the difference between vocational teachers' intended changes and actual changes in school can be connected with five influencing factors that we found, i.e., content relevance, school support, teacher workload, students' interests, and perceived value. These factors exactly explained what facilitates or hinders vocational teachers to realise their planned changes after work placement.

Furthermore, based on the comparison among the three domains of influencing factors of teachers' changes in practice, an interesting point can be noticed. That is, when teachers consider the factors influencing their learning transfer, they conceive the work placement and school environment as the sources of the barriers, whereas they regard their beliefs as the sources of the facilitating factors. This finding could be explained from the perspective of self-serving attributional bias. Individuals would like to apply external variables to explain their unsuccessful experiences while using their internal variables to explain their successful experiences (Bradley, 1978). In addition, it might be that vocational teachers are not satisfied with the current school environment and work placement design.

5.4.3 Limitations

The current study has some limitations that suggest directions for future research. Firstly, vocational teachers' changes in practice were measured based on self-reports. In future research, classroom observations could be added to gain a richer account of

the changes in teachers' practice. Secondly, this qualitative study involved only a small sample of teachers, and based on the findings, quantitative research with a larger sample could be conducted to further examine the impact of the factors found in this study.

5.4.4 Implications for practice

The present study has strong implications for practice. To begin with, the results of the changes in vocational teachers' practice reflect that these teachers benefit a lot from work placement. Therefore, policymakers and school leaders could take more actions to stimulate vocational teachers to participate in work placement. Moreover, our findings with regard to teachers' changes at the school level showed that although vocational teachers planned to take measures for school development, they experienced difficulties in realising those measures. This finding could inspire school leaders to consider how they can support teachers in this respect. Furthermore, the identified factors influencing the effect of work placement on teachers' practice could inspire policymakers, supervisors in work organisations, and school leaders to think about how to further improve the effectiveness of work placement. In this respect, considering work placement programmes and school environment is important. For example, since the findings in this study indicate that clear and specific learning goals are beneficial for supporting teachers to implement change in their practice, school leaders and supervisors in work organisations could stimulate vocational teachers to reflect upon their learning needs and set explicit learning goals before participation in work placement.

Chapter 6

Factors predicting vocational teachers' transfer of learning: A quantitative study in the context of work placement

This chapter is an adapted version of:
Zhou, N., Tigelaar, D. E., Wang, J., & Admiraal, W. Factors predicting vocational teachers' transfer of learning: A quantitative study in the context of work placement. Manuscript in preparation for publication.

Abstract

Work placement is an important way for vocational teachers to update their vocational knowledge and skills. Apart from professional learning during work placement, vocational teachers' application of learning from work placement in school afterwards is also crucial. In this study, we aimed to explore the factors predicting vocational teachers' transfer of learning from work placement to their school. Participants were 372 Chinese secondary vocational teachers from various subject areas. The measurement model showed a good fit. Path analysis results showed that occupational experience, work placement period, personal capacity, content relevance, peer support, and opportunity to use were positive predictors of the transfer of what they learned. Yet, teaching experience and supervisor support were not significant predictors of this transfer generalisation. Besides, transfer generalisation and perceived effects positively predicted vocational teachers' intentions to maintain what they transferred. No moderating effects of the transfer period and perceived effects were found. Theoretical and practical implications are discussed.

6.1 Introduction

In the past decades, vocational teachers' professional learning has obtained much attention from scholars, policymakers, and school leaders (Bound, 2011; Hoekstra et al., 2018; Oude Groote Beverborg et al., 2015; Zeggelaar et al., 2020). Apart from regular learning in school workplace, vocational teachers' learning in the industrial context was also considered an important source to develop themselves, in particular, to improve their occupational expertise. As Andersson and Köpsén (2018) stated, 'The conditions VET teachers face as they seek to develop industry currency are complex as current vocational knowledge is situated in specific work-life practices separated from the practice of school' (p.318). To promote vocational teachers' learning in the real world of work, work placement has been implemented in many countries, including Finland, Australia, China, and England, albeit with different labels, such as work placement periods, industry release, and hands-on programmes (Lloyd & Payne, 2012; Tyler & Dymock, 2019). It is defined as a continuing professional development programme in which vocational teachers acquire occupational knowledge and skills by participating in 'the vocational, work-life community of practice of their teaching subject' (Andersson & Köpsén, 2015, p.2). Through this programme, vocational teachers can break boundaries between school and working life (Andersson & Köpsén, 2015; Lloyd & Payne, 2012).

In China, work placement has been a compulsory programme for all in-service vocational teachers since 2016. The latest document published by the Chinese government states that all vocational teachers are required to undertake work placement for at least one month annually (Ministry of Education of the People's Republic of China & Ministry of Finance of the People's Republic of China, 2021). Most vocational teachers attend work placement during their summer or winter break due to the shortage of teachers to take over their work. During work placement, vocational teachers are encouraged to learn from a variety of formal and informal activities. Qualitative findings from a previous study (Zhou, Tigelaar, & Admiraal, 2021) revealed that vocational teachers learn through doing daily work as an employee, trying out new technologies or work methods, reflecting on these experiences, talking with colleagues, supervisors, or clients in work-life communities, and reading work manuals.

To ensure the efficiency of work placement, both the processes of vocational teachers' learning and transfer of learning are seen as important. The latter concerns

teachers' application of what they have learned in their school workplace, which is directly linked to their teaching performance in school. Previous studies have investigated factors influencing vocational teachers' participation or learning in work placement, such as financial problems, increasing workload, policy regulations, and motivational beliefs (Lloyd & Payne, 2012; Schmidt, 2019; Zhou, Tigelaar, & Admiraal, 2022a). However, a comprehensive overview of factors linked to both transfer of learning and the maintenance of that transfer is still missing. Therefore, the aim of this study is to gain insights into what factors facilitate or hinder vocational teachers' transfer of their learning from work placement to school. The results can enrich our understanding of the process of vocational teachers' learning transfer and support programme designers, policymakers, and school leaders to help vocational teachers to achieve better learning transfer results.

6.2 Literature review

6.2.1 Transfer of learning

Transfer of learning is defined as 'the application of learning acquired within a certain task, situation, or context to another, different task, situation, or context' (Murphy & Tyler, 2005, p.458). As many learning activities are organised as training for improving employees' work performance, the term 'transfer of training' is also frequently adopted (Blume et al., 2010; Gegenfurtner, Veermans, & Vauras, 2013; Suleiman, Dassanayake, & Abang Othman, 2018).

Two aspects of the transfer of learning have been distinguished in earlier work: transfer generalisation and transfer maintenance. These two aspects aim to answer two questions, respectively: 'To what extent individuals' application of learning to their work environment are generalised' and 'To what extent this application persists over time' (Baldwin & Ford, 1988; Blume et al., 2010). Although these two aspects were clarified, limited research applied both of them to measure individuals' transfer of learning, and in particular, transfer maintenance has often been ignored. This also means that if transfer maintenance follows transfer generalisation, the prediction of transfer maintenance by transfer generalisation has not been investigated yet.

Transfer of learning has been studied by many scholars. A few theoretical frameworks and models have been initialled to understand this concept (Blume et al., 2019; Holton, 2005; Vermeulen & Admiraal, 2009). However, most studies on the

transfer of learning are situated in the general field of human resource management, and much fewer studies focused on teachers' professional development and learning. In the field of teacher professional development, compared to the transfer on behaviour, an immediate gain in teachers' cognitions has been more frequently established (Fisher et al., 2010; Hoekstra et al., 2009). Besides, many studies on teachers' transfer of learning merely considered transfer results (changes) in practice instead of the transfer process (Bishop et al., 2012; Hoekstra et al., 2009; Tam, 2014). This leads to our first hypothesis:

H1: Vocational teachers' transfer generalisation will positively predict their transfer maintenance intention.

6.2.2 Factors influencing the transfer of learning

To get a comprehensive understanding of the transfer of learning, previous research strived to explore what factors influence individuals' transfer of learning. In 1988, Baldwin and Ford (1988) proposed a theoretical model of the transfer process. In general, there were three domains of input factors in this model, i.e., trainee characteristics, work environment, and training interventions. Based on this classification, Blume et al. (2010) conducted a meta-analysis of 89 empirical studies and summarised all influencing factors for the transfer of learning and training. This model of factors was then developed further in another review study by De Rijdt et al. (2013), which focused on staff development in higher education. Moreover, Zhou, Tigelaar, and Admiraal (2022b) also explored factors influencing vocational teachers' transfer of learning based on a qualitative method and several factors within the above-mentioned three domains were generated.

6.2.2.1 Teacher characteristics

Teacher characteristics include teachers' experience, personality, and beliefs. Many factors in this domain have been captured in the existing literature, such as self-efficacy, motivation, and locus of control. In our study, we focused on the following three factors.

Work experience. Work experience was generalised as an additional factor in the literature review of De Rijdt et al. (2013) showing three reviewed studies in which novice teachers' positive transfer of learning was achieved. Furthermore, in the study of Jaramillo-Baquerizo, Valcke, and Vanderlinde (2019) novice teachers were more

eager to participate in professional development initiatives than experienced teachers, which then facilitated their transfer of learning. Based on these studies, it seems that teaching experience has a negative relationship with teachers' transfer of learning. In our study, work experience refers to not only vocational teachers' teaching experience but also their occupational experience in working life before becoming a vocational teacher. Although no research has investigated the linkage between vocational teachers' occupational experience and their transfer of learning, the current policies and studies have indicated that vocational teachers with occupational experience can provide their students with more knowledge and information about occupations. In other words, the occupational experience might be beneficial for vocational teachers' learning transfer. Thus, we added the following two hypotheses:

H2: Vocational teachers' teaching experience will negatively predict their transfer generalisation.

H3: Vocational teachers' occupational experience will positively predict their transfer generalisation.

Personal capacity. Personal capacity refers to the extent to which individuals have time, energy, and mental space in their work lives to make changes required to transfer learning to the job. In the Learning Transfer System Inventory (LTSI), personal capacity was found to be an important factor influencing individuals' learning transfer (Holton, Bates, & Ruona, 2000). For teachers, personal capacity is related to their workload in school, and a high workload always means a low personal capacity. Dreer, Dietrich, and Kracke (2017) explored in-service teachers' transfer of learning and found that teachers' capacity for transfer positively predicted their transfer readiness. Based on the above, we developed our fourth hypothesis:

H4: Vocational teachers' personal capacity will positively predict their transfer generalisation.

Perceived effects. Perceived effects describe the positive results of teachers' application of their learning in school. As it occurs after transfer generalisation, it has never been considered an influencing factor in those studies that only focused on transfer generalisation. Yet in a qualitative study, Zhou, Tigelaar, and Admiraal (2022b) found that perceived effects can be seen as a positive factor to promote vocational teachers to keep what they transferred from work placement to school. If we turn to

motivational theories, such as the reinforcement theory of motivation, perceived effects can be seen as a positive consequence that reinforces individuals to repeat their behaviours and performance (Gordan & Amutan, 2014; Skinner, 1958). Hence, we formulated our fifth hypothesis:

H5: Vocational teachers' perceived effects of transfer generalisation will positively predict their transfer maintenance intention.

6.2.2.2 Intervention design

Intervention design factors are focused on the setting characteristics of learning programmes. In the model of De Rijdt et al. (2013), many factors in this domain were displayed, such as need analysis, and learning goals. In the current study, we particularly focused on the following two factors that are related to the setup of vocational teachers' work placement.

Content relevance. Content relevance reflects the extent to which individuals' learning programmes are related to their daily work. In the context of work placement, content relevance refers to that what vocational teachers learned is linked to their teaching in school. In the review study by De Rijdt et al. (2013), content relevance was identified as the most common factor of the intervention design domain, which was mostly positively connected to the transfer of learning. Furthermore, Webster, Mîndrilă, and Weaver (2011) found that individuals' perception of content relevance was positively related to their transfer of learning through affective learning (learning that relates to students' interests, attitudes, and motivations). It seems that a high content relevance could facilitate teachers' learning transfer. Thus, we formulated a sixth hypothesis for our study:

H6: Vocational teachers' perception of content relevance will positively predict their transfer generalisation.

Work placement period. Time spent on learning is also a commonly identified factor influencing the transfer of learning. In many studies amount of learning time spent has been often used to measure teachers' learning engagement (e.g., Jansen in de Wal et al., 2014). In their literature review, De Rijdt et al. (2013) reported that the learning programmes crossing over time (one day with a time lag between the sessions, or more than two consecutive days) had a higher possibility to lead to a positive transfer of

learning than those one-time programmes (one hour/one day to two consecutive days). As prior studies have also found that the time spent on learning can promote individuals' learning achievements (Calafiore & Damianov, 2011), we added a seventh hypothesis:
H7: The learning period of work placement will positively predict vocational teachers' transfer generalisation.

6.2.2.3 School environment

A good transfer climate was seen as particularly important for the occurrence of a transfer of learning. In the model of De Rijdt et al. (2013), a limited number of factors in this domain have been classified, i.e., strategic link, transfer climate, support, opportunity to perform, and accountability. In our study, we mainly paid attention to the following three factors situated in the school environment.

Supervisor support. Supervisor support in our study refers to the assistance that teachers receive from their supervisors in school to apply what they have learned. In previous studies, supervisor support/leadership played an important role in implementing professional development for teachers and changing their teaching in school (Weiner & Lamb, 2020; Whitworth & Chiu, 2015; Winokur & Sperandio, 2017). For example, Fancera (2020) explored how school leaders applied social media and networking (SMN) for teachers' professional development, and the results reached that school leadership stimulates SMN use for professional development is beneficial for teachers to engage in the related platforms. Winokur and Sperandio (2017) showed that transformational leadership was positively linked to teachers' increased transfer of training to their classrooms. Based on this, we have developed another hypothesis:
H8: Vocational teachers' perception of supervisor support will positively predict their transfer generalisation.

Peer support. Peer support includes the assistance and appraisal received from colleagues. Prior research has revealed that many peer-support learning activities, such as peer observation, perform a positive influence on teachers' competencies and practice as well as student achievements (Hsieh et al., 2021; Jin et al., 2022). In addition, peer support in school has also played a critical role in helping teachers

improve their learning outcomes or transferring results from a teacher development programme. Both in the model of De Rijdt et al. (2013) and Holton, Bates, and Ruona (2000), peer support is seen as a vital factor influencing individuals' transfer of learning. Therefore, we formulated a ninth hypothesis:
H9: Vocational teachers' perception of peer support will positively predict their transfer generalisation.

Opportunity to use. Opportunity to use addresses whether teachers are provided with enough resources and space to apply what they have learned from learning programmes in school. In the review study of De Rijdt et al. (2013), opportunity to use was one of the most frequent work environment factors affecting individuals' transfer of learning. Since the context of work placement is different from the school workplace, opportunity to use may be an important factor influencing vocational teachers' transfer. Thus, we added another hypothesis:
H10: Vocational teachers' perception of opportunity to use will positively predict their transfer generalisation.

6.2.2.4 Moderating factors

Transfer period and perceived effects were added as moderating factors in our study. In previous studies, transfer of learning was measured with or without a time lag between the end of the intervention and the transfer measure, but differences in the transfer period have not been studied yet. Some scholars argue that a longer transfer period may produce a better transfer of learning, as it needs time to implement what has been learned. However, others assume that a shorter transfer period might be more effective for the transfer of learning because the implementation follows closer to the learning. Based on this, De Rijdt et al. (2013) encouraged future research to concentrate on time lag conditions (short and long-term time lag) as a moderating factor. And for perceived effects, since it describes how individuals assess the effect of the transfer that they have generalised and it occurs between transfer generalisation and transfer maintenance, it can help individuals to have a deep reflection on their generalised transfer and consider to what extent they would like to maintain their transfer. In a positive level of perceived effects, a high transfer generalisation may lead to a high transfer maintenance intention, while in a negative level of perceived effects, it can be possibly different. Therefore, although a positive prediction of

transfer generalisation on transfer maintenance was hypothesised in our study, it might be influenced by perceived effects. Then, we formulated the following two hypotheses:
H11: Transfer period will moderate the relationship between influencing factors and vocational teachers' transfer generalisation.
H12: Vocational teachers' perceived effects of transfer generalisation will moderate the relationship between their transfer generalisation and transfer maintenance intention.

6.2.3 Our study

Previous work has concluded that transfer of learning is critical for understanding individuals' learning outcomes, and a series of influencing factors has been generated. Yet, the existing studies have several limitations. First, although transfer generalisation and maintenance have been identified as two main constructs, they are hardly examined together and the linkage between these two concepts has not been explored. Second, most factors that influence the transfer of learning were generated and examined in the field of human resource management. Yet, little is known about the field of teacher professional development. Third, studies only examined a small number of influencing factors. Fourth, the moderating effect on the prediction for transfer of learning was seldom addressed. Therefore, in our study, we would like to examine the factors predicting vocational teachers' transfer of learning. A general research question was eventually formulated, 'Which factors are related to vocational teachers' transfer of learning in the context of work placement?' The research model is shown in Figure 6.1 and, to sum up, the hypotheses are:
H1: Vocational teachers' transfer generalisation will positively predict their transfer maintenance intention.
H2: Vocational teachers' teaching experience will negatively predict their transfer generalisation.
H3: Vocational teachers' occupational experience will positively predict their transfer generalisation.
H4: Vocational teachers' personal capacity will positively predict their transfer generalisation.
H5: Vocational teachers' perceived effects of transfer generalisation will positively predict their transfer maintenance intention.
H6: Vocational teachers' perception of content relevance will positively predict their

transfer generalisation.

H7: The learning period of work placement will positively predict vocational teachers' transfer generalisation.

H8: Vocational teachers' perception of supervisor support will positively predict their transfer generalisation.

H9: Vocational teachers' perception of peer support will positively predict their transfer generalisation.

H10: Vocational teachers' perception of opportunity to use will positively predict their transfer generalisation.

H11: Transfer period will moderate the relationship between influencing factors and vocational teachers' transfer generalisation.

H12: Vocational teachers' perceived effects of transfer generalisation will moderate the relationship between their transfer generalisation and transfer maintenance intention.

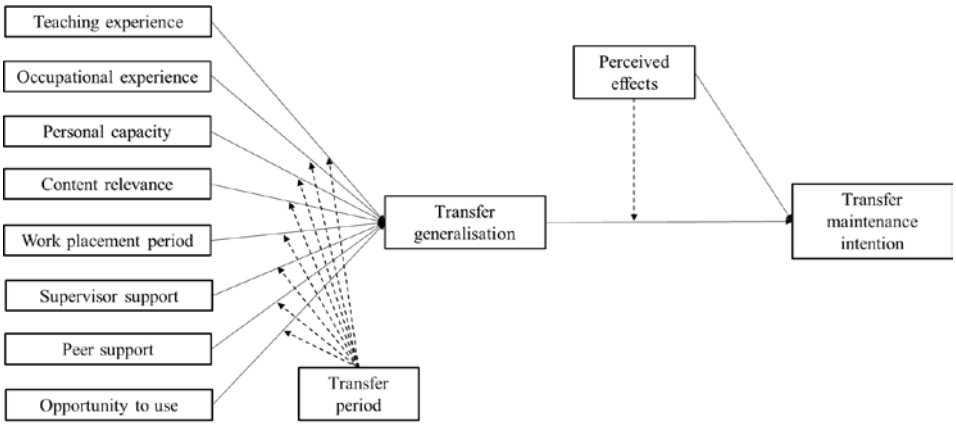

Figure 6.1 The research model of this study.

6.3 Method

6.3.1 Participants

The participants were 372 Chinese secondary vocational teachers, who taught students aged from 15 to 17 years. The background information details of the participants were shown in Table 6.1. There were 170 females and 202 males, aged from 22 to 59 years.

Most participants (around 86%) had attained a bachelor's degree or higher level of education. The average teaching experience of the participants was 14.49 in years (SD=9.289). And, more than 40% of the participants had occupational experience in the industry or society before becoming a vocational teacher. With regards to the experience of work placement, about 50% of the participants attended the latest work placement within the past half a year, while others attended it more than half a year ago. Furthermore, around half of vocational teachers had undertaken the latest work placement for less than one month, and others had more than one month. Moreover, a wide range of teaching subjects was reflected in the sample, such as hotel management, nursing, numerical control technology, and cooking.

Table 6.1 Demographic information of the participants.

Variables	Category	Frequency	Percent %
Gender	Female	170	45.70
	Male	202	54.30
Age	≤30	45	12.10
	31-40	189	50.81
	41-50	100	26.88
	≥51	38	10.21
Highest educational attainment	Diploma of secondary vocational school	1	0.27
	Senior college degree	31	8.33
	Bachelor degree	195	52.42
	Master degree	125	33.60
	Doctorate degree	20	5.38
Teaching experience	1-10	139	37.37
	11-20	153	41.13
	21-30	55	14.78
	31-40	25	6.72
Occupational experience	Yes	214	57.53
	No	158	42.47
Time for attendance in work placement	Less than half a year ago (from 2021.07)	189	50.81
	More than half a year ago (before 2021.07)	183	49.19
Period for work placement	< 1 month	184	49.46
	≥1 month	188	50.54

6.3.2 Data collection

The data was collected through an online survey using Qualtrics. We recruited vocational teachers in the following two ways. First, we made use of a public list of 2021 national work placement programmes for vocational teachers, which attached the contact information of the organisers from companies (Ministry of Education of the People's Republic of China, 2021). Specifically, we sent letters to the organisers of 73 work placement programmes on the list to ask them whether they would like to

help us to carry out this survey, and we received 25 responses with permission. Then, we requested those to send our survey invitation to vocational teachers who attended their work placement programmes in 2021. Second, we also utilised our network to collect responses. In particular, we asked for help from several principals of secondary vocational schools to give out questionnaires. It was explained to participants that participation was voluntary, and that the data would be kept confidential and would only be available for research purposes. Most teachers spent 10 to 15 minutes completing the questionnaire. This study acquired ethical approval from ICLON Research Ethics Committee with the number IREC_ICLON 2020-06.

6.3.3 Measures

The questionnaire used in this study was presented in Appendix E, and it contained two scales that separately aimed at measuring transfer of learning and related factors.

6.3.3.1 Transfer of learning

Transfer of learning was divided into transfer generalisation and transfer maintenance intention, which were measured with six items each. These items were developed based on the qualitative findings of Zhou, Tigelaar, and Admiraal (2021, 2022b), which focused on vocational teachers' changes in school practice after participating in work placement. There were three levels of transfer, including school, collegial, and individual teaching practice. The items of transfer generalisation and transfer maintenance were almost the same, except the former used past tense to ask participants to what extent they had made changes, while the latter used future tense to ask them to what extent they would like to keep changes. An example of transfer generalisation is 'I adapted my teaching content based on what I learned in this work placement.' and of transfer maintenance intention 'I will keep using the adapted teaching content in my class'. Teachers rated their agreement with each item, ranging from 1 ('It's not applicable to me at all') to 5 ('It's totally applicable to me') with 'neutral' serving as the midpoint. For each item of transfer generalisation, when participants choose '1', they were asked to skip the corresponding item of transfer maintenance intention. The average score of the items was used to present the extent of vocational teachers' transfer generalisation and transfer maintenance intention.

6.3.3.2 Independent factors

To measure the factors influencing vocational teachers' transfer of learning, we

employed the Learning Transfer System Inventory (LTSI), which was developed from the perspective of human resource development. Recently, LTSI has been updated to version 4, which includes 48 items within 16 factors (Bates, Holton, & Hatala, 2012). Until now, LTSI has been translated into more than ten languages and has been widely used in many countries. In our study, we utilised and adapted the items of five factors from LTSI to our context, including personal capacity, content relevance, supervisor support, peer support, and opportunity to use. Regarding another factor 'perceived effects', four items were developed based on the qualitative results of Zhou, Tigelaar, and Admiraal (2022b). The number of items and examples are shown in Table 6.2. Teachers rated their agreement with each item, ranging from 1 ('Strongly disagree') to 5 ('Strongly agree') with 'neutral' serving as the midpoint.

Table 6.2 The examples of factor items

Factor variables	**Number of items**	**Item examples**
Personal capacity	3	There is too much happening at school for me to try to use this work placement.
Content relevance	3	I like the way this work placement seems so much related to my school work.
Supervisor support	3	My school supervisor meets with me to discuss ways to apply this work placement in school.
Peer support	3	My colleagues at school appreciate my using what I learned in this work placement.
Opportunity to use	3	The resources needed to use what I learned in this work placement are available in my school.
Perceived effects	4	I found my job performance as a teacher improved because of my transfer from this work placement to my school.

Apart from the above-mentioned factors, there were also four demographic factor variables, i.e., teaching experience (years), occupational experience (years), work placement period, and transfer period. For the work placement period, '0' represents that the time spent in work placement is less than one month, while '1' represents more than one month. For the transfer period, '0' means that vocational teachers participated in work placement within the last six months and '1' means that they took

their work placement more than half a year ago.

6.3.4 Data analysis

6.3.4.1 Common method bias

Since we used one-time self-report items to investigate vocational teachers' transfer of learning and influencing factors, there might be a risk of variance that is attributable to the measurement method instead of to the constructs, which is called common method bias. Therefore, we conducted Harman's single-factor test by SPSS 26.0 to check the common method bias. All scale items except demographic information were imported to conduct exploratory factor analysis and were required to load on a single factor without rotation. The results showed that this single factor accounted for 43.685% of the total variance, which was lower than the cutting-off point of 50% (Harman, 1976). Thus, we concluded that the common method bias is not problematic in the current study.

6.3.4.2 Measurement model

To verify the reliability and validity of the latent variables, we gathered all corresponding items to conduct confirmatory factor analysis (CFA) with Mplus 8.3. The measurement model demonstrated an acceptable fit ($\chi 2$ = 434.042, df=137, CFI=0.944, TLI=0.931, RMSEA=0.076, SRMR=0.056). As shown in Table 6.3, all items loaded well on the corresponding factors (0.694-0.939). Depending on those item loadings, we also computed the composite reliability (CR) and convergence validity (AVE) of each factor, which showed a good fit (CR>0.8, AVE>0.6). The values of Cronbach's alpha for each factor were also calculated and all of them were above 0.8, which suggested a high internal consistency for the items in each factor. Moreover, we examined the discrimination validity of the variables. As shown in Table 6.4, the square root of the AVE of all factors (presented in bold) is larger than any correlation. Thus, the test of discriminant validity was acceptable.

Table 6.3 CFA factor loadings, validity and reliability of the latent variables and items

Variables	**Items**	**Parameters of significant test**				**Item Reliability**	**Composite Reliability**	**Convergence Validity**	**Cronbach's alpha**
		Estimate	**S.E.**	**Est/S.E.**	**P**	**R-square**	**CR**	**AVE**	
Personal capacity (PC)	PC1	0.763	0.027	28.756	***	0.582	0.870	0.692	0.868
	PC2	0.857	0.022	38.867	***	0.734			
	PC3	0.872	0.022	40.316	***	0.760			
Content relevance (CR)	CR1	0.847	0.021	40.868	***	0.717	0.845	0.647	0.832
	CR2	0.862	0.020	42.922	***	0.742			
	CR3	0.694	0.033	21.311	***	0.482			
Supervisor support (SS)	SS1	0.833	0.019	44.861	***	0.695	0.901	0.753	0.897
	SS2	0.939	0.012	75.381	***	0.881			
	SS3	0.827	0.020	42.060	***	0.684			
Peer support (PS)	PS1	0.856	0.017	50.836	***	0.732	0.915	0.783	0.912
	PS2	0.910	0.013	72.647	***	0.829			
	PS3	0.887	0.014	63.021	***	0.786			
Opportunity to use (OPP)	OPP1	0.763	0.025	29.904	***	0.581	0.859	0.671	0.857
	OPP2	0.833	0.020	41.220	***	0.694			
	OPP3	0.859	0.019	46.215	***	0.737			
Perceived effects (PE)	PE1	0.815	0.020	39.912	***	0.664	0.903	0.699	0.902
	PE2	0.825	0.020	41.905	***	0.681			
	PE3	0.877	0.016	56.214	***	0.768			
	PE4	0.825	0.020	41.863	***	0.680			

Table 6.4 Discriminant validity

	Personal capacity	Content relevance	Supervisor support	Peer support	Opportunity to use	Perceived effects
Personal capacity	**0.831**					
Content relevance	0.081	**0.804**				
Supervisor support	0.091	0.646	**0.868**			
Peer support	0.149	0.669	0.700	**0.885**		
Opportunity to use	0.212	0.777	0.676	0.793	**0.819**	
Perceived effects	0.144	0.677	0.639	0.797	0.774	**0.836**

6.3.4.3 Path analysis

To test the relationship between vocational teachers' transfer of learning and hypothesised factors, we firstly carried out a Pearson correlation analysis of all continuous variables through SPSS 26.0. Then, path analysis was carried out through Mplus 8.3 following our research model as presented in Figure 6.1. The path model showed a good fit: $\chi 2$ =593.935, df=229, CFI=0.941, TLI=0.929, RMSEA=0.065, SRMR=0.062. Furthermore, moderating analysis was executed to examine the moderating effect of the transfer period and perceived effects. We used Process 3.0 in SPSS 26.0 to analyse the moderating effect of the transfer period and perceived effects.

6.4 Results

6.4.1 Descriptive statistics and bivariate correlations

In Table 6.5, descriptive statistics and correlations of all the measured continuous variables are reported. Among all independent scale variables, the mean score of vocational teachers' perception of opportunity to use was the highest, while supervisor support and personal capacity were the lowest. The correlation results show that almost all variables were significantly correlated, except for teaching experience. Most of the significant correlations were above 0.1, but no more than 0.8. But, the correlation between transfer generalisation and transfer maintenance intention was quite high (0.858).

Table 6.5 Descriptive statistics and Pearson correlations of all measured continuous variables

Variables	Mean	SD	1	2	3	4	5	6	7	8	9	10
1.Teaching experience	14.490	9.289	1									
2.Occupational experience	1.740	3.577	-0.095	1								
3.Personal capacity	3.314	0.859	-0.015	0.065	1							
4.Content relevance	3.723	0.646	-0.034	0.168**	0.088	1						
5.Supervisor support	3.445	0.786	-0.023	0.176**	0.059	0.587**	1					
6.Peer support	3.746	0.684	0.027	0.158**	0.117*	0.626**	0.652**	1				
7.Opportunity to use	3.910	0.583	-0.037	0.165**	0.173**	0.694**	0.598**	0.704**	1			
8.Perceived effects	3.798	0.585	0.039	0.156**	0.109*	0.633**	0.591**	0.729**	0.682**	1		
9.Transfer generalisation	3.812	0.619	-0.009	0.206**	0.225**	0.589**	0.522**	0.590**	0.598**	0.580**	1	
10.Transfer maintenance intention	3.940	0.544	-0.072	0.199**	0.230**	0.565**	0.461**	0.591**	0.591**	0.586**	0.858**	1

Note: * p<0.05, **p<0.01

6.4.2 Main effect results

Based on the path analysis, we captured the relationship of our hypothesised factors with vocational teachers' transfer of learning. As shown in Table 6.6, vocational teachers' occupational experience had a positive prediction on their transfer generalisation, which means that teachers with more occupational experience reported more transfer from the work context to school. Besides, vocational teachers' perception of personal capacity, content relevance, peer support, and opportunity to use positively predicted transfer generalisation. Moreover, we also found a positive association between work placement period and vocational teachers' transfer generalisation. These factors explained 48.70% of the variance in transfer generalisation. Teaching experience and supervisor support were found to have no significant relation with transfer generalisation. With respect to transfer maintenance intention, we found that vocational teachers' transfer generalisation and perceived effects positively predicted their intention for transfer maintenance, with a 74.70% variance explained. In sum, except for H2 and H8, all hypotheses related to the direct relationship were supported.

Table 6.6 The results of path analysis

Independent variables	**Transfer generalisation**			**Transfer maintenance intention**		
	β	**S.E.**	**R^2**	**β**	**S.E.**	**R^2**
Teaching experience	0.014	0.038	0.487	-	-	0.747
Occupational experience	**0.080***	0.041		-	-	
Work placement period	**0.075***	0.049		-	-	
Personal capacity	**0.132****	0.043		-	-	
Content relevance	**0.216***	0.085		-	-	
Supervisor support	0.055	0.065		-	-	
Peer support	**0.211****	0.082		-	-	
Opportunity to use	**0.245***	0.105		-	-	
Perceived effects	-	-		**0.160****	0.035	
Transfer generalisation	-	-		**0.764****	0.027	

Note: * $p<0.05$, ** $p<0.01$

6.4.3 Moderating effect results

Moderating analysis was conducted to test whether transfer period moderated the relationship of all hypothesised factors on transfer generalisation and whether perceived effects moderated the relationship between transfer generalisation and transfer maintenance intention. As displayed in Table 6.7, the results show that there was no moderating effect of transfer period, which means that the association between all factors and vocational teachers' transfer generalisation keeps constant over time. Similarly, the moderating effect of perceived effects was not significant, which implies that no matter to what extent vocational teachers perceived the effects of their transfer, they would like to keep using what they have transferred to a stable extent. This means that H11 and H12 are not supported.

Table 6.7 The results of moderating analysis

Dependent variables	**Independent variables**	**Independent variables and moderators**	**B**	**S.E.**	**P-value**	**LLCI**	**ULCI**
Transfer generalisation	Teaching experience	Teaching experience	-0.001	0.004		-0.008	0.006
		Transfer period	0.013	0.065		-0.114	0.140
		Interaction	0.011	0.007		-0.003	0.024
	Occupational experience	Occupational experience	0.036	0.009	**	0.019	0.054
		Transfer period	0.021	0.063		-0.103	0.145
		Interaction	0.014	0.018		-0.021	0.048
	Work placement periods	Work placement periods	0.097	0.064		-0.030	0.223
		Transfer period	0.005	0.064		-0.122	0.132
		Interaction	-0.059	0.129		-0.313	0.194
	Personal capacity	Personal capacity	0.168	0.037	**	0.095	0.240
		Transfer period	0.031	0.063		-0.093	0.154
		Interaction	-0.086	0.074		-0.230	0.059
	Content relevance	Content relevance	0.563	0.040	**	0.483	0.642
		Transfer period	0.002	0.052		-0.101	0.104
		Interaction	0.060	0.081		-0.098	0.219
	Supervisor support	Supervisor support	0.411	0.035	**	0.342	0.480
		Transfer period	-0.008	0.055		-0.116	0.100
		Interaction	-0.007	0.070		-0.146	0.131
	Peer support	Peer support	0.538	0.038	**	0.463	0.614
		Transfer period	-0.053	0.052		-0.156	0.049
		Interaction	0.052	0.765		-0.099	0.202
	Opportunity to use	Opportunity to use	0.639	0.045	**	0.551	0.726
		Transfer period	0.015	0.052		-0.087	0.116
		Interaction	0.069	0.089		-0.107	0.244
Transfer maintenance intention	Transfer generalisation	Transfer generalisation	0.687	0.028	**	0.632	0.743
		Perceived effects	0.125	0.030	**	0.066	0.183
		Interaction	0.018	0.032		-0.045	0.080

Note: * $p<0.05$, ** $p<0.01$

6.5 Discussion and conclusion

Factors predicting the transfer of learning have been examined in previous studies (Burke & Hutchins, 2007; Cheng, 2016; Jackson, Fleming, & Rowe, 2019; Suleiman, Dassanayake, & Abang Othman, 2018). Our study examined the factors linked to vocational teachers' transfer of learning in the context of work placement from a quantitative perspective. The results showed that first, six factors positively predicted vocational teachers' transfer generalisation, i.e., occupational experience, personal capacity, content relevance, work placement periods, peer support, and opportunity to use. Second, vocational teachers' transfer generalisation and perceived effects positively predicted their transfer maintenance intention. Third, there was no moderating effect of transfer period and perceived effects on the above-mentioned predictions.

6.5.1 Factors predicting vocational teachers' transfer generalisation

Among the factors predicting vocational teachers' transfer of learning, we found that vocational teachers' perceptions of personal capacity, content relevance, peer support, and opportunity to use were positive predictors of their transfer generalisation, which were in line with most previous studies, in particular the comprehensive conceptual model developed by Holton et al. (1997). Our study provided strong empirical evidence on the relationship of these factors with the transfer of learning in this specific context of teacher professional learning. Moreover, a positive linkage between vocational teachers' occupational experience and transfer generalisation was also confirmed in our study, which was not yet explored before. This finding seems easy to be understood, as vocational teachers with occupational experience already have much experience in the transfer of learning from the industrial context to teaching in school, which may help them to transfer after participating in work placement. Regarding the learning period, our findings illustrated that a longer learning period led to a higher extent of transfer generalisation. Although a few studies in the review research of De Rijdt et al. (2013) investigated the effect of the learning period on staff transfer of learning, they were more focused on the consecutiveness of learning instead of learning duration. Therefore, our finding extends the insights into the linkage between time spent and transfer results.

Aside from the above-mentioned significant predictions on transfer

generalisation, a non-significant relationship between supervisor support with transfer generalisation was found, which differs from the prior work (e.g., Burke & Hutchins, 2007). The reason might be that most vocational teachers do not often receive supervisor support in their school context. This explanation can be supported by the descriptive statistics of our study, in which the mean score of supervisor support was much lower than the other factors except for personal capacity. Moreover, a non-significant prediction of teaching experience on transfer generalisation was also unexpected. As work placement differs from other teacher learning programmes, vocational teachers might be not so familiar with the context of work placement, which may lead them to some dilemmas for transfer, no matter whether teachers are novice or experienced teachers.

6.5.2 The prediction of transfer generalisation and perceived effects on transfer maintenance

Considering the relationship between transfer generalisation and transfer maintenance, our findings showed that vocational teachers' transfer generalisation positively and strongly predicted their transfer maintenance intention, which suggests that vocational teachers like to maintain what they have transferred from work placement to their teaching in school. To our knowledge, this is the first research to explore the relationship between these two types of transfer.

At the same time, the perceived effects were also discovered as a positive predictor of teachers' transfer maintenance intention, which means that teachers would like to keep using what they have transferred to school workplace when they perceive the positive effects of their transfer. Although this is a newly identified factor, it can be well explained by the motivational theories, in particular, the reinforcement theory of motivation (Gordan & Amutan, 2014; Skinner, 1958), which stated that a positive result could function as a reinforcement for individuals' persistence on performing this behaviour.

6.5.3 The moderating effect of transfer period and perceived effects

The results of our study found that the transfer period did not have a moderating effect on any relationship between transfer generalisation and its factors. This suggests that the influence of these factors on the transfer of learning keeps unaltered, even if

teachers followed work placement more than 6 months ago. This result enriches our understanding of how the time lag between programme completion and possible implementation in school of what teachers have learned. This finding is in line with the findings of Zhou, Tigelaar, and Admiraal (2021), who showed that most vocational teachers' transfer intentions were achieved after five months.

Similarly, we also clarified that vocational teachers' perceived effects did not moderate the relationship between transfer generalisation and their transfer maintenance intention. This demonstrated that no matter whether vocational teachers perceived effects of their transfer, they would like to maintain to apply what they had transferred. Both these two non-moderating effects reflect that the direct influence of work placement programme was quite strong.

6.5.4 Limitations

Although our study successfully examined the factors influencing vocational teachers' transfer of learning in the context of work placement, still, several limitations need to be addressed. First, only a self-report survey was employed in our study to measure the transfer of learning, which might have led to an overestimation of what teachers have transferred. Therefore, we suggest future research will investigate vocational teachers' transfer of learning in a more objective way, such as through personal observation. Second, we used cross-sectional data to analyse transfer generalisation and transfer maintenance. Although we have used different tenses in the questionnaire items, it might that this was not so evident for some participants. Therefore, a longitudinal survey will be welcomed in the future. Third, although we addressed the most relevant factors in our study, still some other factors were not included, such as personality traits, motivation, and need analysis. Thus, future studies might focus on other possible factors.

6.5.5 Implications

There are strong theoretical and practical implications of our study. Concerning the theoretical implications, the results of our study provided an overview of factors which may associate with vocational teachers' transfer of learning in a specific context of teacher professional learning. In particular, some new factors were tested, which enrich our current understanding of the transfer process. Moreover, the linkage between transfer generalisation and maintenance is presented, which stimulates future

scholars to use them to explore the transfer of learning. Besides, no moderating effect of the transfer period and perceived effects make us realise that the impact of work placement programmes could persist over time.

For practical implications, our study can provide suggestions for school leaders, programme designers, and other practitioners in vocational education to promote vocational teachers' transfer of learning from work placement to school workplace. Firstly, as vocational teachers with less occupational experience were found to report less transfer of learning, these teachers can be more supported in their learning process. Secondly, considering the positive linkage of work placement period with transfer of learning, the programme designers may consider prolonging the length of work placement programmes, and school leaders might provide vocational teachers more time to conduct their work placement. Thirdly, as a result of the positive relationship of peer support and opportunity to use with vocational teachers' transfer of learning, school leaders could think about how to meet the needs of teachers to apply what they have learned from work placement and how to encourage teachers within a team to collaborate with each other to support transfer of learning. Fourthly, given that teachers' personal capacity was a positive predictor of their transfer of learning, school leaders ought to explore ways to decrease vocational teachers' workload, which may increase their energy, time and mental space to transfer what they have learned from work placement to school.

Chapter 7

Conclusion and discussion

7.1 Introduction

In addition to the school workplace, industry or society is another effective context for vocational teachers to develop their professional competence. This dissertation was intended to provide insight into vocational teachers' professional learning in the context of work placement, which is a popular programme in Chinese vocational education. We started with a general review of vocational teachers' professional learning in all different contexts. Then, we turned to vocational teachers' learning processes in work placement and investigated these in-depth with regard to 1) Vocational teachers' learning motivation and engagement in work placement; 2) Vocational teachers' learning goals, activities, and outcomes in work placement; 3) Factors influencing vocational teachers' application or transfer of learning from work placement to school. The results were aimed at promoting our understanding of what, how, and why vocational teachers learn and how they apply what they have learned, and also, we aimed to make suggestions for improvement of work placement initiatives.

The section below will first summarise the main findings of our five studies. Second, those main findings will be discussed in-depth from theoretical and practical perspectives. Then, we will address the limitations of our studies and indicate directions for future studies. Last, implications for practice will be reported.

7.2 Summary of the main findings

Chapter 2 The aim of this study was to bring forward an overview of how vocational teachers' learning in different contexts occurs and what they obtain from their learning. Although this thesis particularly concerns vocational teachers' professional learning in a specific programme named 'work placement', we believe that a review of vocational teachers' professional learning in all contexts at the beginning is necessary, because this could facilitate our comprehensive understanding of vocational teachers' learning experience. The specific research questions of this study were: 1) How can vocational teachers' professional learning activities be characterised? 2) What outcomes of vocational teachers' professional learning can be distinguished? We performed search strategies through the Library of Leiden University, which consists of several databases, such as Web of Science and ERIC. The search keywords were: Title included professional development OR professional learning OR teacher training

OR teacher learning AND Any field included vocational teachers OR VET teachers. Based on the inclusion and exclusion criteria, a number of 54 peer-review articles were finally selected and analysed in this study.

The results of the analyses of this literature data base summarised vocational teachers' learning activities and we identified them into four categories, i.e., pre-defined professional development programme, self-directed/initiated activities in school, collaborative activities in school, and industry-based activities. And, work placement was categorised into the last category, which was seen as particularly common for vocational teachers to keep their occupational expertise up-to-date. Besides, we generalised vocational teachers' learning outcomes acquired from these activities or programmes. The model of learning outcomes from Harland and Kinder (2014) was employed as a conceptual framework for analysing their learning outcomes with eight types of outcomes: knowledge and skills, teaching practice, affective outcomes, value congruence, motivational and attitudinal beliefs, institutional outcomes, new awareness, and student outcomes. Most of them were identified as positive in the reviewed studies. In particular, we discovered that knowledge and skills and teaching practice were the most identified common outcomes. For the former, in contrast with pedagogical knowledge and occupational knowledge, pedagogical content knowledge was much less frequently examined in the previous studies.

Chapter 3 After reviewing vocational teachers' learning in all contexts, we focused on their learning in the specific programme 'work placement'. Although work placement has been implemented nationwide in China, many vocational teachers performed low engagement in this programme. A few external barriers that hinder vocational teachers to participate in work placement have been identified in prior studies, such as increased workload and financial problems. Other factors linked to vocational teachers themselves, such as motivational beliefs, have been examined less. This study was aimed at exploring the connection between vocational teachers' motivational beliefs and their engagement in the context of work placement. There are two research questions: 1) What is the relationship between vocational teachers' motivational beliefs and engagement in work placement? 2) Does teaching experience have a moderating effect on this relationship? To answer these research questions, we applied the conceptual framework of expectancy-value theory, which emphasises that

individuals' achievement is achieved by their expectancy for success and task value. A number of 426 Chinese secondary vocational teachers were invited as participants to complete the questionnaire.

Based on exploratory factors analysis, we distinguished four motivational beliefs; task value, self-efficacy, task effort, and emotional cost. The multivariate linear regression analysis and moderating effect test were then conducted to explore the linkage between these motivational beliefs and engagement in work placement and the moderating effect of teaching experience on this relationship. The results showed that vocational teachers' task value, task effort, and self-efficacy positively and emotional costs negatively predicted their behavioural, cognitive, and emotional engagement. In addition, task effort, emotional cost, and self-efficacy were found to be positive predictors of vocational teachers' agentic engagement. The findings of moderating effect test revealed that teaching experience negatively moderated the relationship between vocational teachers' two cost variables (task effort and emotional cost) and behavioural, cognitive, and emotional engagement, which means that the connection between perceptions of cost and engagement was stronger for those teachers with less teaching experience.

Chapter 4 Since work placement has been recognised as a popular learning programme in Chapter 2, how vocational teachers' learning occurs is still ambiguous. Thus, we wanted to provide a richer picture of vocational teachers' learning process in the context of this programme through an interview study. Three specific research questions were formulated: 1) What are vocational teachers' perceived learning activities in work placement and which activities do they perceive to be important? 2) What are vocational teachers' perceived learning goals and outcomes? 3) How do vocational teachers perceive the connection between their learning activities and outcomes? We interviewed 27 secondary vocational teachers who just completed work placement and analysed the transcripts from a qualitative perspective. In the procedure of coding, we employed the categories generated from previous studies on teachers' learning activities in school workplace and professionals' learning activities in the industrial workplace as well as a model of learning outcomes developed by Harland and Kinder (2014).

Concerning learning activities, the results showed that vocational teachers' learning activities in work placement were in line with our coding scheme, which comprised doing tasks, experimenting, mentoring, reflecting, learning from others

with interaction, learning from others without interaction, and formal training. In particular, learning from others with and without interaction were employed by the largest number of participants and mentoring was most frequently perceived as an important activity. Regarding learning outcomes, twelve categories of outcomes were identified in our study and eight categories of them were also reported as learning goals. And, we found that the most two frequently recognised outcomes were occupational knowledge and skills, and occupational information. Besides, six categories of vocational teachers' intentional behavioural outcomes were also found and these were divided into three levels, i.e., school, collegial, and individual teaching practice. Each learning activity was commonly linked to many types of outcomes. In turn, each learning outcome was also clarified to be related to more than one activity. Especially, occupational knowledge and skills were acquired most frequently from all learning activity categories except reflecting.

Chapter 5 The influence of teachers' professional learning on students' performance is often through a significant change in teachers' practice in school. As work placement is organised outside school, vocational teachers' changes in school practice could be seen as how they apply the knowledge, skills, and beliefs acquired from this programme in their school practice. The aim of this study was to get an insight into what and how vocational teachers make applications of their learning from work placement within their school. The research questions were:1) What are vocational teachers' changes in their school practice based on work placement? 2) What factors do vocational teachers perceive as facilitating or hindering for implementation of their changes in school practice? To obtain a more complicated view, both the teachers' actual and intended changes were investigated from a longitudinal perspective. A number of 18 participants were interviewed twice: when they completed work placement and after a semester they come back to school.

Based on qualitative analysis, we found that first, vocational teachers' actual and intended changes were located in six categories within three levels, i.e., school level, collegial level, and individual teaching level (Adapting teaching content, enriching teaching resources, providing career guidance, and organising competence-based activities or settings). Compared to school and collegial levels, vocational teachers' application at individual teaching level was more frequently observed. Second, this study also identified thirteen facilitating and hindering factors that influence

vocational teachers' applications of what they have learned from work placement in their school practice. These factors were divided into three domains, respectively teacher characteristics, work placement, and school environment. Specifically, five factors were found as related to the domain of teacher characteristics, including motivation to transfer, perceived utility, perceived effect, transfer self-efficacy, and amount of experience. The factors related to the domain of work placement were learning goals, duration of work placement, and content relevance. The last domain of school environment consists of students' interests, teachers' workload, disruption of prescribed teaching pacing, students' readiness, and school support.

Chapter 6 The process that vocational teachers draw upon in their learning experience to make changes within their school practice can be also seen as a transfer of learning. In prior studies, transfer of learning has been defined as 'the application of learning acquired within a certain task, situation, or context to another, different task, situation, or context' (Murphy & Tyler, 2005, p.458). The findings from Chapter 5 generated a few factors that can affect vocational teachers' transfer of learning from a qualitative perspective. In this study, we examined these factors on a large scale. After reviewing the findings from study 4 and prior related studies, we found that factors linked to the transfer of learning could be mainly derived from three domains, i.e., teacher characteristics, intervention design (programme design), and school environment (transfer climate). We then developed twelve hypotheses, which concerned not only the relationship between factors and the transfer of learning but also the moderating effect of transfer period and perceived effects on that relationship. To collect data, a questionnaire was employed. The participants were 372 Chinese secondary vocational teachers.

The results of path analysis revealed that vocational teachers' occupational experience, their perception of personal capacity, content relevance, peer support, opportunity to use, and work placement periods had positively predicted their transfer generalisation. However, their teaching experience and perception of supervisor support were found to have no significant relationship with their transfer generalisation. With regards to transfer maintenance -which means whether teachers keep using what they have learned-, our findings showed that vocational teachers' transfer generalisation and perceived effect positively predicted their maintenance of transfer. Furthermore, the analysis of moderating effect displayed that neither

vocational teachers' transfer period nor perceived effect moderated the relationships between our hypothesised factors and transfer of learning.

7.3 Discussion of the main findings

7.3.1 Is work placement an effective learning programme for vocational teachers?

As we have stated at the start of this dissertation, work placement has been a popular programme in recent years, which has been implemented in many countries (Andersson & Köpsén, 2015; Zaid & Champy-Remoussenard, 2015). The review findings of Chapter 2 also summarised that work placement has been the most frequently programme situated in the industry for vocational teachers. However, the previous studies appear to take it for granted that work placement is an effective programme, while no studies deeply explored or examined in what aspects work placement could help vocational teachers. Based on this, we conducted three studies of Chapter 4, Chapter 5, and Chapter 6 to respond to this question.

Specifically, the results of Chapter 4 displayed vocational teachers' learning outcomes from work placement. Twelve types of outcomes have been generated, i.e., affective outcome, finding a gap between working life and vocational education, institutional outcome, materials and cases, motivational and attitudinal outcomes, new awareness, new ideas for teaching, occupational information, personal life such as teachers social circle, occupational knowledge and skills, research ability, and value congruence, which cover vocational teachers' cognitive and emotional outcomes as well as institutional benefits. Although the categories of learning outcomes from Harland and Kinder (2014) were employed as a framework in this study, we found three new categories which were not identified in earlier work, i.e., finding a gap between working life and vocational education, personal life such as teachers social circle, and research ability. And among these twelve outcomes, occupational knowledge and skills were identified as the most frequent outcome, which was also the most frequent learning goal of vocational teachers. This implies that vocational knowledge and skills were still the main concern for vocational teachers to participate in work placement.

Besides, Chapter 4 also framed vocational teachers' intentional changes in

behaviours and six categories within three levels (school, collegial, and individual) were presented, i.e., improving school education (school level), collaborating with colleagues (collegial level), adapting teaching content, enriching teaching resources, providing career guidance, and organising competence-based activities or settings (all at the individual level). Compared to school and collegial levels, changes ate the individual level were more frequently mentioned by vocational teachers based on their experience of work placement. In Chapter 5, we further confirmed these behavioural outcomes of vocational teachers based on their actual experience in school. 18 of 27 participants from Chapter 4 were invited to be interviewed after working for a semester. The same six categories were examined and the results revealed that most vocational teachers can realise their intentional behavioural changes in school. Furthermore, Chapter 6 was conducted to investigate vocational teachers' behavioural changes with a large-scale survey. The term 'transfer generalisation' was used to represent vocational teachers' changes in school practice based on their experience of work placement. In addition, vocational teachers' intention to maintain their changes named 'transfer maintenance' was also inquired. Although we didn't display vocational teachers' performance on each change in practice, the average score of all these changes for transfer generalisation and maintenance was calculated. The results showed that vocational teachers had a high extent of transfer generalisation and maintenance.

Based on the above, we concluded that vocational teachers could acquire a lot from work placement. Although the main purpose of implementing work placement in China was improving vocational teachers' occupational knowledge and skills, we found that vocational teachers could get many other benefits from this programme, such as enriching their personal life, and improving their school practice. In particular, the impact of work placement on vocational teachers' school practice could persist for a long time. Therefore, this dissertation confirmed that work placement is an effective programme for vocational teachers.

In line with prior studies on teachers' professional development (Bakkenes, Vermunt, & Wubbels, 2010; Guskey, 2002; Vanblaere & Devos, 2016), this dissertation addressed changes in vocational teachers' cognition and behaviours from learning. However, it provides a more comprehensive framework for understanding teachers' learning outcomes, which consists of knowledge, beliefs, emotions, awareness, and practice with regard to school, collegial, and individual levels. In

contrast with learning activities in school workplace or other professional development programmes, vocational teachers from work placement can get some unique outcomes which are particularly related to the context of the industry, such as finding a gap between working life and vocational education.

7.3.2 Characterise vocational teachers' learning in work placement and enhance their engagement

Since the findings from this dissertation support the idea that work placement is an effective programme for vocational teachers, we would like to concentrate on vocational teachers' learning in this programme and consider how to promote their engagement in this programme. This is particularly important in China, in which work placement is a compulsory learning programme, with a large number of vocational teachers showing low engagement in this programme (Gou & Yang, 2019; Zhang & Fang, 2016). In this dissertation, Chapter 3 and Chapter 4 focused on vocational teachers' learning and engagement in work placement.

In Chapter 3, we investigated how vocational teachers' motivational beliefs connected with their engagement in work placement. As we mentioned above, work placement is a compulsory learning programme and each vocational teacher has to attend it under the regulations of the Chinese government. In this context, we inferred that teachers' motivational beliefs may play an important role in ensuring vocational teachers' engagement. In this study, as vocational teachers' learning varies from different work placement programmes, we used a general view to describe their engagement, not specifying particular activities. The results demonstrated that teachers' perceptions of task value, task effort, and self-efficacy were positively and emotional cost was negatively associated with their behavioural, cognitive, and emotional engagement in work placement. As well, teachers' perceptions of task effort, self-efficacy, and emotional cost also positively predicted their agentic engagement. The positive linkage of task value and self-efficacy with learning engagement aligned with the results of prior studies (Bandura, 1997; Jones et al., 2015; Judge et al., 2007; Zhang & Liu, 2019). However, the connection between cost and engagement was added by our research. We obtained that for Chinese vocational teachers, higher perceived task effort was related to their higher engagement with behaviours, cognition and emotion. And we consider this might be caused by two reasons. The

first one is that individuals' success or failure is attributed more to their effort from Asian perspectives (Mok, Kennedy, & Moore, 2011), which means the greater one's desire to succeed or improve, the greater the effort one perceives to be required. The other one is East Asian perceptions of self-worth. Once individuals perceive the costs to be higher, they might endorse stronger performance approach goals, in order to retain their self-worth ((Jiang, Rosenzweig, & Gaspard, 2018).

Moreover, vocational teachers' specific learning was pictured in Chapter 4. Although learning activities in work placement were also described in prior studies, they were usually part of policy statements or regulations (Ministry of Education of the People's Republic of China, 2016; Toze & Tierney, 2010). Our study yielded empirical data to summarise all of their possible activities occurring in the work context. Learning activities were further explored based on vocational teachers' self-reports identifying seven categories of activities, i.e., doing tasks, experimenting, mentoring, reflecting, learning from others with interaction, learning from others without interaction, and formal training. This indicates that vocational teachers could draw upon a variety of formal and informal ways to learn in work placement. As the reviewed results of Chapter 2 noted, vocational teachers' professional learning in other contexts, such as school, and other well-designed programmes could be also formal and informal. Although most learning activities in work placement were also common in those contexts, they more addressed the connection of vocational teachers with the actors in the industry, such as communicating with employees, and getting mentoring from employees. Among those activities in work placement, learning from others with and without interaction were the most frequently reported categories and mentoring was most frequently perceived as an important category. This implies that vocational teachers as beginners in the work context, attach particular importance to the structured or non-structured support of others in host organisations. This is also reflected on the setting of other professional development programmes in which programme organisers usually provide much support and guidance for vocational teachers (Zeggelaar, Vermeulen, & Jochems, 2018, 2020).

7.3.3 Factors influencing vocational teachers' transfer of learning from work placement to school

A successful application of teachers' learning plays an important role in ensuring the

effectiveness of learning programmes and the improvement of teaching practice (Ciraso, 2012; Jaramillo-Baquerizo, Valcke, & Vanderlinde, 2019; Winokur & Sperandio, 2017). As the context of work placement is totally different from school workplace, vocational teachers' transfer of learning might encounter difficulties. Therefore, Chapter 5 and Chapter 6 of this dissertation were aimed at investigating factors influencing or connecting with vocational teachers' transfer of learning from work placement to school.

Concretely, Chapter 5 used a qualitative way with interviews to explore the factors facilitating or hindering vocational teachers' transfer of learning. There were thirteen factors illustrated, i.e., motivation to transfer, perceived utility, perceived effect, transfer self-efficacy, amount of experience, learning goals, duration of placement, content relevance, students' interests, teachers' workload, disruption of prescribed teaching pacing, students' readiness, and school support. These factors were classified into three domains, named teacher characteristics, work placement, and school environment, which were in line with frameworks or models from previous literature (Blume et al., 2010; De Rijdt et al., 2013; Ford, 1988). Although many of these factors have been recognised by prior scholars (Dreer, Dietrich, & Kracke, 2017; Holton, Bates, & Ruona, 2000; Webster, Mîndrilă, & Weaver, 2011; Winokur & Sperandio, 2017), several factors were newly developed in this study, such as students' interests on vocational teachers' changes.

Since these factors were identified from a qualitative approach, Chapter 6 further examined these from a quantitative perspective. To get a comprehensive understanding of factors influencing transfer of learning, we compare the results from these two studies. Firstly, the factors teaching experience, work placement periods, content relevance, and teachers' workload from Chapter 5 were added as independent variables in Chapter 6 and the results showed that they were significant predictors except for teaching experience. Secondly, the factor school support from Chapter 5 was split into peer support, supervisor support, and opportunity to use in Chapter 6. The findings illustrated that peer support and opportunity to use significantly predict teachers' transfer of learning. Thirdly, some factors that focused on the results of transfer in Chapter 5, i.e., students' high interests and disruption of prescribed teaching pace were integrated into perceived effects in Chapter 6. We found that they positively predicted teachers' transfer maintenance. We further divided the factors identified in Chapter 5 into factors relating to transfer generalisation and maintenance in Chapter

6. Fourthly, some factors developed from Chapter 5 were not taken as input in Chapter 6, such as motivation to transfer, perceived utility, and transfer self-efficacy, because these factors need to be measured before the occurrence of transfer. Fifthly, teachers' occupational experience was added as a factor in Chapter 6, which was not identified in Chapter 5 and the findings revealed that this factor was positively associated with teachers' transfer of learning. It seems that in contrast with teaching experience, occupational experience plays a more important role in promoting teachers' transfer of learning from work placement to school. Previous work has confirmed that occupational experience could support vocational teachers' teaching practice (Andersson & Köpsén, 2018; Green, 2015), which seems that vocational teachers with occupational experience have already transfer experience from the industry to school. This might be helpful for vocational teachers to further keep transferring after attending work placement.

In general, the findings from Chapter 5 and 6 in combination provide an overview of factors influencing vocational teachers' transfer of learning. In particular, we considered the characteristics of vocational education in our studies. Some newly identified factors also enrich prior literature which focused on teachers' transfer of learning (Blume et al., 2010; De Rijdt et al., 2013; Dreer et al., 2017; Ford,1988; Holton et al., 2000).

7.4 Limitations

Three limitations should be addressed in this dissertation. Firstly, the way of data collection was the main limitation for all empirical studies in this dissertation except for the systematic literature review. From Chapter 3 to Chapter 6, investigating vocational teachers learning motivation, engagement, activities, goals, outcomes, and influencing factors for transfer, only vocational teachers' self-reports were used and analysed, while other ways such as observations, interviews or questionnaires surveys from other roles in work placement such as company employers, school leaders, and programme designers were not included. Although we tried to ensure that enough vocational teacher participants both in our qualitative and quantitative studies, self-reports may have two potential risks. The first one is that vocational teachers' responses are biased towards positive answers as the participants want to make a good impression, which we cannot verify from other perspectives. The other one is that one single data source cannot provide a comprehensive description of teachers' learning

activities and outcomes.

Secondly, only secondary vocational teachers were involved in this dissertation. As secondary and higher vocational education focus on different levels of vocational education, the requirements for vocational teachers' professionalisation as well as their learning needs and opportunities may be different from each other, such as their highest educational qualification. Therefore, their learning and transfer experience in the context of work placement may also differ. For example, in Chapter 5, we found that vocational students' low learning performance and capacity hindered their teachers' transfer of learning from work placement. However, this factor may be not so evident when turning to higher vocational education, in which students usually get a higher capacity after learning from secondary vocational education. This implies that the results of our studies may vary between secondary and higher vocational education.

Thirdly, the use of cross-sectional data for our quantitative studies (Chapter 3 and Chapter 6) was another notable limitation. Although we aimed to carry out a longitudinal survey to explore the casual relationship between vocational teachers' motivational beliefs and engagement (Chapter 3) as well as their transfer of learning and its influencing factors (Chapter 6), we found this was hard to achieve because we could not seek for enough vocational teacher participants who were willing to complete the questionnaires for two times over a long period. Then we had to adapt our design of data collection and try to collect data at one point of time. Therefore, we could not examine casual relationships.

7.5 Recommendations for future research

Based on the findings and limitations of this dissertation, we would like to make five suggestions for future research. First, as the findings from the dissertation have shown that work placement can be an effective programme for vocational teachers, future research can explore how to promote vocational teachers' professional learning in this programme. Concretely, prior literature has illustrated some factors that influence vocational teachers' participation in work placement, whereas limited research has focused on factors influencing their learning during this programme. In Chapter 3, we revealed that vocational teachers' motivational beliefs are important factors associated with their engagement in this programme. However, other factors linked to the design of programmes and support from other actors have not been explored yet. Therefore,

we advise future researchers to further probe into these.

Second, the results of this dissertation have displayed that industry companies that organised work placement could benefit from it (Chapter 4), such as relieving employees' workload. And this might provide a direction for future scholars to concern about how to motivate companies to participate in work placement. In the context of Chinese vocational education, a big challenge for implementing work placement is that industry companies do not want to be involved in organising this programme. Although school-company cooperation has been advocated in Chinese vocational education for many years, those companies prefer organising work placement for vocational students instead of teachers due to the lack of benefits observed by them with regard to teachers' work placement. The findings from this dissertation could inspire future research to explore ways to prompt the engagement of companies in teachers' work placement.

Third, as we noted in the section of limitations, only self-reports were used in this dissertation, which might not provide a comprehensive overview of vocational teachers' learning in work placement. Therefore, we encourage future research to apply different methods as well as various stakeholder perspectives to further examine vocational teachers' learning in this programme. For instance, observation by the researchers could be a good way to describe vocational teachers' learning activities during work placement.

Fourth, apart from secondary vocational teachers, higher vocational teachers' learning in work placement can also be examined in the future. It might be that different motivation, learning activities and outcomes will be found. Including both secondary and higher vocational teachers provides a more complete understanding of vocational teachers' learning in this programme.

Fifth, longitudinal research would also be welcomed in the future. In Chapter 6, as we used cross-sectional data, several important factors derived from Chapter 5 were not examined, such as self-efficacy and perceived utility. To get an in-depth view of factors influencing vocational teachers' leaning and transfer of learning, we expect more longitudinal studies could be conducted in the future.

7.6 Implications for practice

In addition to implications for future research, this dissertation also provided practical suggestions for developing vocational teachers' learning and transfer from work

placement.

7.6.1 Suggestions for vocational teachers

As the focused group of this dissertation, vocational teachers could be naturally inspired for their future learning in work placement by the findings reported in this dissertation. As we mentioned before, many vocational teachers show low engagement in work placement and have no idea of how to learn in this programme. Chapter 4 of this dissertation provides them with potential activities during work placement, which can promote their understanding of how they can learn in this programme. Besides, the learning outcomes displayed by this chapter could also help vocational teachers to know what they can get from this programme. In addition, the identified connection between learning activities and outcomes is useful for vocational teachers to find appropriate ways to get expected outcomes. And, the results of changes in school practice based on work placement experience provide vocational teachers directions for how they can make use of this experience (Chapter 4 & 5). In general, based on the overview of their learning activities, outcomes, and changes in school practice, vocational teachers could show an improved readiness for their professional learning and adapt to the new environment well in work placements.

Moreover, the findings from this dissertation have illustrated that clear learning goals could facilitate vocational teachers' transfer of learning from work placement to school (Chapter 5). This suggests that vocational teachers are supposed to set specific learning goals with regard to cognition or teaching practice before starting work placement.

7.6.2 Suggestions for school leaders

As a backer of work placement, school leaders could take measures based on the results of this dissertation to support vocational teachers' participation, learning, and transfer from work placement to school. First, as Chapter 3 found that vocational teachers' motivational beliefs were significantly related to their engagement in work placement, school leaders might help vocational teachers to strengthen or weaken some of these beliefs. For example, school leaders can organise meetings to introduce values of work placement for vocational teachers to improve their perception of task value. Second, vocational teachers' learning outcomes identified in this dissertation (Chapter 4 & 5) can be used by school leaders to assess or monitor vocational teachers'

professional learning in work placement. Third, as we found that personal capacity and opportunity to use positively predicted vocational teachers' transfer of learning from work placement to school, school leaders should consider how to relieve vocational teachers' workload to give them more opportunities and space to transfer what they learned from work placement.

Fourth, as work placement was found to be useful for developing teacher colleagues' teaching performance (collegial level) and peer support was also found to be beneficial for vocational teachers' transfer of learning, school leaders may think about how to promote teacher collaboration in school. More formal and informal communication opportunities between vocational teachers could be enriched in the future.

7.6.3 Suggestions for programme designers

The findings from this dissertation could also inspire programme designers or industry companies to consider how to improve the design of work placement. To begin with, as we found that vocational teachers are able to learn from a variety of activities during work placement, including formal and informal ways (Chapter 4), programme designers could consider all of them as learning sources when designing activities for vocational teachers. Compared to formal learning, informal learning was more difficult to design as its occurrence was directed by vocational teachers. However, programme designers still can provide a good setting for teachers to work on informal learning. For example, since vocational teachers could learn from others with interaction, such as employees and managers, programme designers may take some measures to encourage employees and managers to actively engage in communication with vocational teachers during work placement. In addition, learning from objectives, such as manuals, books, and professional journals was also found to be a good informal learning way for vocational teachers. Moreover, because this dissertation has found that mentoring was perceived as the most important activity by most participants, programme designers are supposed to employ it and design it more carefully.

Aside from learning activities, programme designers could also be inspired about learning period and learning content design. Chapter 6 of the dissertation revealed that a longer period of work placement resulted in a higher extent of transfer of learning. This may encourage programme designers to try to extend the work

placement period. Still, an important precondition is that vocational teachers get permission from their school leaders. In addition, content relevance which was found to be important for vocational teachers' transfer of learning should be particularly concerned by programme designers. To achieve a high extent of content relevance, programme designers could investigate participants' teaching subjects, prior work placement experience, and learning needs before designing this programme.

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Summary

Rapid changes of industry and society require vocational teachers to keep their occupational expertise and teaching practice up to date. In addition to school-based learning, industry-based learning has become increasingly important for them. In this context, work placement has been implemented in many countries, such as Sweden, France, and China (Andersson & Köpsén, 2015; Zaid & Champy-Remoussenard, 2015). It is defined as a continuing professional development programme in which vocational teachers retain their occupational expertise through participating in 'the vocational, work-life community of practice of their teaching subject' (Andersson & Köpsén, 2015, p.2). Although the value of work placement has been indicated by prior scholars, how vocational teachers' learning takes place and how they make use of this learning experience were not clear. To get a deep insight into vocational teachers' learning in this programme, this dissertation specifically focuses on vocational teachers' learning process in work placement.

Chapter 1: General introduction

Work placement has been implemented nationwide in Chinese vocational education, and all vocational teachers have been required to conduct this programme for at least six months within each five-year period since 2016. However, there are several obstacles for vocational teachers, programme designers, and school leaders to engage in work placement. It seems that all these obstacles were derived from the lack of understanding of vocational teachers' learning in this programme. Prior studies strived to probe into factors influencing vocational teachers' participation in this programme, while these seldomly focused on vocational teachers' learning in this programme.

The context of this dissertation is focused on Chinese vocational education, which includes secondary and higher vocational education. Compared to the latter, the former plays a more basic role in inducting fresh students from school into workplace occasions. In China, vocational education is typically school-based, and school curriculums are normally created or designed as syntheses of theoretical and practical modules. Therefore, vocational teachers have to have a 'dual competence' which pertains to 'teaching' and 'work'. In this context, the concept of 'dual qualified teachers' was developed and work placement was implemented. The policy history of work placement started with 'The Law on Vocational Education of People's Republic of China' published in 1996, which for the first time indicated that companies need to provide vocational teachers with learning opportunities.

To picture vocational teachers' learning in work placement, we employed four types of frameworks, which focused on different research questions. First, the expectancy-value theory developed by Eccles et al. (1983) was used to structure vocational teachers' motivational beliefs for work placement. In this model, expectancy for success and task value were considered as two main motivational components that influence an individual's choice, persistence and achievement. Second, the categories of learning activities from the school and industrial workplace were reviewed to explore vocational teachers' learning activities in work placement. Third, to investigate vocational teachers' learning outcomes from work placement, we employed the model of learning outcomes derived from Harland & Kinder (2014). There are nine types of learning outcomes in this model concerning cognition and behaviour. Fourth, previous models about factors influencing the transfer of learning were applied to examine what factors could facilitate or hinder vocational teachers to make changes in school practice based on the experience of work placement.

Based on the descriptions of the context of work placement and prior conceptual frameworks, five studies were designed. The first study was a literature review and generalised vocational teachers' learning activities and outcomes in all contexts. Then, the following four studies focused on vocational teachers' learning in work placement from an empirical perspective. Specifically, Chapter 3 explored the relationship between vocational teachers' motivational beliefs and their engagement toward work placement. In Chapter 4, vocational teachers' learning process, including learning activities, goals, and outcomes during work placement was investigated. Furthermore, Chapter 5 and Chapter 6 provided insight into vocational teachers' transfer of learning from work placement to school workplace with qualitative and quantitative approaches separately. The main research questions for each study were:

1. What are vocational teachers' professional learning activities and outcomes in all various of contexts? (Chapter 2)
2. What is the relationship between vocational teachers' motivational beliefs and engagement in work placement (Chapter 3)
3. What are vocational teachers' learning activities, goals, and outcomes in work placement (Chapter 4)
4. What is the impact of work placement on vocational teachers' school practice and what factors influence its impact (Chapter 5)
5. How do factors predict vocational teachers' transfer of learning from work

placement to school (Chapter 6)

Chapter 2: Vocational teachers' professional learning: A systematic literature review of the past decade

A systematic literature review of vocational teachers' professional learning in different contexts was conducted in this chapter. As contemporary society changes rapidly, vocational teachers are expected to keep their professional abilities up to date. And their professional learning has been concerned by scholars and practitioners. The purpose of this study is to generalise vocational teachers' professional learning experience for the past decade. The research questions were:

1) How can vocational teachers' professional learning activities be characterised?

2) What outcomes of vocational teachers' professional learning can be distinguished?

To respond to the research questions, literature published from Jan 2010 to August 2021 was searched by using the following terms: Title included professional development OR professional learning OR teacher training OR teacher learning AND Any field included vocational teachers OR VET teachers. After the literature screen and selection, 54 articles were included in further analysis. Learning activities and learning outcomes have been described in 54 articles and 37 articles, respectively. To categorise vocational teachers' learning outcomes, a model of learning outcomes from Harland and Kinder (2014) was used as a coding scheme.

Regarding vocational teachers' learning activities, the results displayed four main categories, respectively pre-defined professional development programme, self-directed/initiated activities in school, collaborative activities in school, and industry-based activities. These categories confirm that vocational teachers' professional learning can occur in academia, industrial, and work settings, and in both formal and informal ways. For each category, there were several specific activities included. Different from the category of industry-based activities, which is unique for only vocational teachers, the other three categories were also common for general teachers' learning. Concerning vocational teachers' learning outcomes, this study summarised eight types of outcomes, consisting of knowledge and skills, teaching practice, affective outcomes, value congruence, motivational and attitudinal beliefs, institutional outcomes, new awareness, and student outcomes. Among these categories, knowledge and skills as well as teaching practice, were found to be the

most frequently identified learning outcomes. In addition, most of the learning outcomes reported in the reviewed studies were classified as positive.

The results of this study provide an overview of vocational teachers' learning activities and outcomes, which can be used as a theoretical framework for future scholars to further explore vocational teachers' professional learning. And, the results also make suggestions for policy-makers and school leaders to promote vocational teachers' professional learning.

Chapter 3: The relationship between vocational teachers' motivational beliefs and their engagement in work placement

In this chapter, a quantitative approach was used to investigate the relationship between vocational teachers' motivational beliefs and learning engagement in work placement. Although work placement has been implemented nationwide in China, a number of vocational teachers performed low engagement during this programme (Xun & Yang, 2019; Zhang & Fang, 2016). In addition to some external barriers, teachers' motivational beliefs might provide an important additional explanation for their engagement. Therefore, this study is driven by two research questions:

1) What is the relationship between vocational teachers' motivational beliefs and their engagement in work placement?

2) Does teaching experience have a moderating effect on this relationship?

Next, in the section on the theoretical framework, firstly the expectancy-value theory developed by Eccles et al (1983) was used to explain vocational teachers' motivational beliefs for work placement. Second, prior studies are described that focused on the structure of learning engagement and the relationship between motivational beliefs and engagement. It appears that most of those studies displayed a positive relationship to some extent (Jones, Johnson, & Campbell, 2015; Wang & Eccles, 2013). Third, the role of teaching experience on motivational beliefs and learning engagement was concluded from previous studies and the results showed that there is a difference between novice and experienced teachers. In addition to the review of prior studies, also the setting of work placement in the context of Chinese vocational education was described.

To collect data, 426 Chinese secondary vocational teachers were invited to fill out the questionnaire. Four main components were measured: task value, cost, self-efficacy, and learning engagement. Based on the exploratory factor analysis, four

motivational belief factors, i.e., task value, task effort, emotional cost, and self-efficacy and two engagement factors, i.e., a combination of behavioural, cognitive, and emotional engagement and agentic engagement were produced. Furthermore, multivariate linear regression analysis and moderating effect analysis were carried out to explore the relationship between motivational beliefs and engagement and the moderating effect of teaching experience.

The findings showed that vocational teachers' perceptions of task value, task effort, and self-efficacy were significantly positive predictors, whereas emotional cost was a negative predictor of their behavioural, cognitive, and emotional engagement. Besides, teachers' perceptions of task effort, self-efficacy, and emotional cost were positively related to their agentic engagement. The moderating effect analysis results showed that vocational teachers' teaching experience had a significant and negative moderating effect on the relationship between two cost variables (task effort and emotional cost) and behavioural, cognitive, and emotional engagement. This suggests that the lower the teaching experience, the stronger the relationship of task effort and emotional cost with behavioural, cognitive, and emotional engagement in the context of work placement.

The finding that task value and self-efficacy are the positive predictors of their engagement in work placement aligns with most previous studies (Bandura 1997; Eccles et al., 1983; Jones et al., 2015; Zhang & Liu, 2019). The positive relationship between teachers' task effort and their engagement, which is in contrast with most previous research, may be explained by insights about attribution theory and self-worth theory from Asian perspectives. Regarding attribution theory, previous studies have indicated that in Asian cultures, the greater one's desire to succeed or improve, the greater the effort one perceives to be required (Mizokawa & Ryckman, 1990). Concerning self-worth theory, research conducted by Jiang et al. (2018) used East Asian students' perceptions of self-worth to explain the finding that Korean students' perceived cost positively predicted their approach goals. Following this explanation, when students perceive the costs to be higher, they might endorse stronger performance approach goals, in order to retain their self-worth. The moderating role of teaching experience can be explained by the comparison of novice and experienced teachers' learning experiences.

Chapter 4: Understanding vocational teachers' professional development in work placement: learning goals, activities, and outcomes

In this chapter, vocational teachers' learning experience during work placement was explored. Although work placement was valued by prior scholars and practitioners (Andersson & Köpsén, 2015; Zaid & Champy-Remoussenard, 2015), how vocational teachers' learning takes place and what they can obtain from this programme were still not explicit. Thereby, this study aimed at providing an insight into their learning process in the context of work placement.

Aside from the introduction of work placement in the context of Chinese vocational education, the findings from prior studies on teachers' professional development were reviewed. Concerning learning activities, in addition to teachers' learning activities, professionals' learning activities in the industrial workplace were also considered because of the context of our study. For learning goals and outcomes, the model of learning outcomes from Harland and Kinder (2014) was employed, which includes nine types of learning outcomes. Besides, the connection between learning activities and outcomes was also reviewed. Based on the review results and the purpose of this study, three main research questions guided this study:

1) What are vocational teachers' perceived learning activities in work placement and which activities do they perceive to be important?

2) What are vocational teachers' perceived learning goals and outcomes?

3) How do vocational teachers perceive the connection between their learning activities and outcomes?

To get a comprehensive understanding of vocational teachers' learning process in work placement, semi-structured interviews with 27 vocational teacher participants were conducted. All of them were interviewed individually within one week of completing their work placement. The interview protocol was focused on three themes: 1) learning activities that teachers used in work placement; 2) learning goals that teachers set for work placement; 3) learning outcomes that teachers obtained from work placement, including their intentions for practice. To analyse data, two schemes of learning activities and outcomes were developed based on prior studies (Harland & Kinder, 2014; Meirink, Meijer, & Verloop, 2007). The generalised categories showed good reliability and validity.

The results illustrated seven categories of learning activities, i.e., doing tasks, experimenting, mentoring, reflecting, learning from others with interaction, learning

from others without interaction, and formal training. Among these activities, learning from others with and without interaction were the most frequently reported categories and mentoring, learning from others with interaction, and formal training were most frequently perceived as important. Besides, twelve categories of outcomes were identified in this study and eight categories of them were also reported as learning goals. Based on the reports of the participants, acquiring knowledge and skills was the most common learning goal for attending work placement. In addition, six categories of vocational teachers' intentional changes in practice in school were also generalised. Finally, the results showed that all learning activity categories were related to many learning outcomes, which means that vocational teachers could get more than one type of outcome for each activity.

The findings of this study provided an overview of vocational teachers' learning experience in work placement. The finding of vocational teachers' learning activities in work placement was almost the same as prior research focusing on workplace learning activities. It seems that teachers particularly value the structured or non-structured support of others in host organisations. Regarding learning outcomes, several categories were developed or adapted from the model of Harland and Kinder (2014) to the context of work placement.

Chapter 5: Factors influencing the impact of work placement on vocational teachers' school practice

In this chapter, the impact of work placement on vocational teachers' practice in school and factors influencing this impact were explored. An effective professional development programme could usually lead to changes in teachers' teaching practice. Since no studies have illustrated how vocational teachers apply what they learned from work placement to school workplace, in this study a qualitative approach was used to provide insight into this, which enriched existing understandings of teachers' learning in work placement.

After describing the context of work placement in Chinese vocational education, previous studies on teachers' changes in school practice were reviewed, which yielded two important insights. The first one was that teachers' changes in practice are related to a variety of forms, and the other one was that there are often inconsistencies between teachers' intended changes and their actual changes in practice. Besides, prior insights on factors influencing teachers' use of learning in practice, which can be also

called transfer of learning, were reviewed. In general, factors related to the transfer of learning have commonly been classified into three domains, including learner characteristics, intervention design, and work environment (Blume et al., 2010; De Rijdt et al., 2013). Based on the above, we developed two research questions:

1) What are vocational teachers' intended and actual changes in their school practice based on work placement?

2) What factors do vocational teachers perceive as facilitating or hindering for implementing their changes in school practice?

To integrally understand vocational teachers' changes in school practice, semi-structured interviews were conducted twice with 18 secondary vocational teachers. The first-round interviews were carried out within one week after completing work placement and would like to concern vocational teachers' learning experience in work placement as well as their planned changes in school practice. The second-round interviews were conducted at the end of the semester following work placement with the aim to gain insight into vocational teachers' actual changes in school practice as well as into factors influencing them to make changes.

The results identified six categories of vocational teachers' changes in school practice, which were related in three levels, i.e., school, collegial, and individual classroom practice. Besides, the comparison between their intentional and actual changes showed that most vocational teachers realised their plans of changes in practice. With regard to factors influencing their changes, this study generated thirteen factors, which were categorised into three domains, i.e., teacher characteristics, work placement, and school environment.

The results of vocational teachers' changes in school practice after work placement confirmed that vocational teachers' changes in school practice have various forms and are not only focused on their teaching practice. Concerning influencing factors, although many factors have been identified in prior studies, several factors were newly framed in this study, such as perceived effects.

Chapter 6: Factors predicting vocational teachers' transfer of learning: A quantitative study in the context of work placement

In this chapter, factors associated with vocational teachers' transfer of learning were further examined by a quantitative approach. Transfer of learning is the process by that teachers make use of their learning experience to make changes in school practice

(Murphy & Tyler, 2005). Although some factors influencing the transfer of learning have been identified in Chapter5, these were derived from a small sample of vocational teachers. Therefore, the purpose of this study was to further examine these at a large scale.

Subsequently, factors from three domains were selected (teacher characteristics, work placement, and school environment) and hypothesises were developed based on the findings of prior studies and Chapter 5. Transfer of learning in this study was divided into transfer generalisation and transfer maintenance. Ten factors were included, i.e., teaching experience, occupational experience, work placement period, personal capacity, content relevance, supervisor support, peer support, opportunity to use, and perceived effects. Besides, two hypotheses were proposed in which transfer period and perceived effects were employed as moderators on the above-mentioned relationships.

A questionnaire survey was used to collect data and 372 Chinese secondary vocational teachers completed it. The items for transfer of learning were developed based on the results of Chapter 4 & 5. And, the items of personal capacity, content relevance, supervisor support, peer support, and opportunity to use were adapted from the Learning Transfer System Inventory (LTSI) (Bates et al., 2012). In addition, four items of perceived effects were developed based on the qualitative results of Chapter 5.

The measurement model showed a good model fit. The path analysis results revealed that vocational teachers' occupational experience, perceptions of personal capacity, content relevance, peer support, opportunity to use, and work placement period positively predicted transfer generalisation. Moreover, it was found that vocational teachers' transfer generalisation and perceived effects positively predicted their intention for transfer maintenance. In addition, no moderating effect of the transfer period and perceived effects was confirmed.

These findings provide empirical evidence of factors connecting with vocational teachers' transfer of learning in the context of work placement. Many factors have been identified by prior scholars, and some new factors were confirmed, such as occupational experience. Besides, the non-significant prediction of teaching experience and supervisor support on transfer generalisation was unexpected. An explanation for the former could be that teachers were not familiar with the context of work placement, which may lead them to some dilemmas for transfer, no matter

whether teachers are novice or experienced teachers. The explanation for the latter may be that teachers seldomly received support from their supervisors. Moreover, the non-significant moderating effect of the transfer period and perceived effects indicated that the influence of work placement on vocational teachers' practice was quite strong and could persist for a long term.

Chapter 7: Discussion and Conclusion

In the final chapter, a general discussion of the five studies of this dissertation was provided. To begin with, we summarise the main findings of the five studies. Then, those main and interesting findings were located and further discussed. Next, the major limitations of this dissertation and the directions for future research were reflected upon. Lastly, the suggestions of this dissertation for vocational teachers, school leaders, and programme designers were provided.

Based on the main findings, we discussed the following three aspects:

1) The effectiveness of work placement. As the results of Chapter 4, 5, & 6 generalised a variety of vocational teachers' learning outcomes with regard to cognition and behaviour, we confirmed that work placement is an effective learning programme for vocational teachers.

2) Vocational teachers' learning and engagement in work placement. The findings of Chapter 3 & 4 have revealed that vocational teachers could make use of various formal and informal activities during work placement and motivational beliefs were also found to be important factors associated with their engagement. This could provide us with an understanding of how vocational teachers' learning takes place.

3) Factors influencing vocational teachers' transfer of learning from work placement to school. The results of Chapter 5 & 6 generalised and examined factors connecting with vocational teachers' transfer of learning, which can be categorised into three domains, i.e., teacher characteristics, work placement, and school environment.

Three limitations were addressed. The first one was that only vocational teachers' self-reports were used to collect data for all empirical studies in this dissertation, which may lead to biased and non-comprehensive responses. The second one was that only secondary vocational teachers were involved in this dissertation, excluding higher vocational education teachers. The third one was we only used cross-sectional data for the quantitative studies, instead of a longitudinal research design. Based on

these limitations, we also made suggestions and directions for future research.

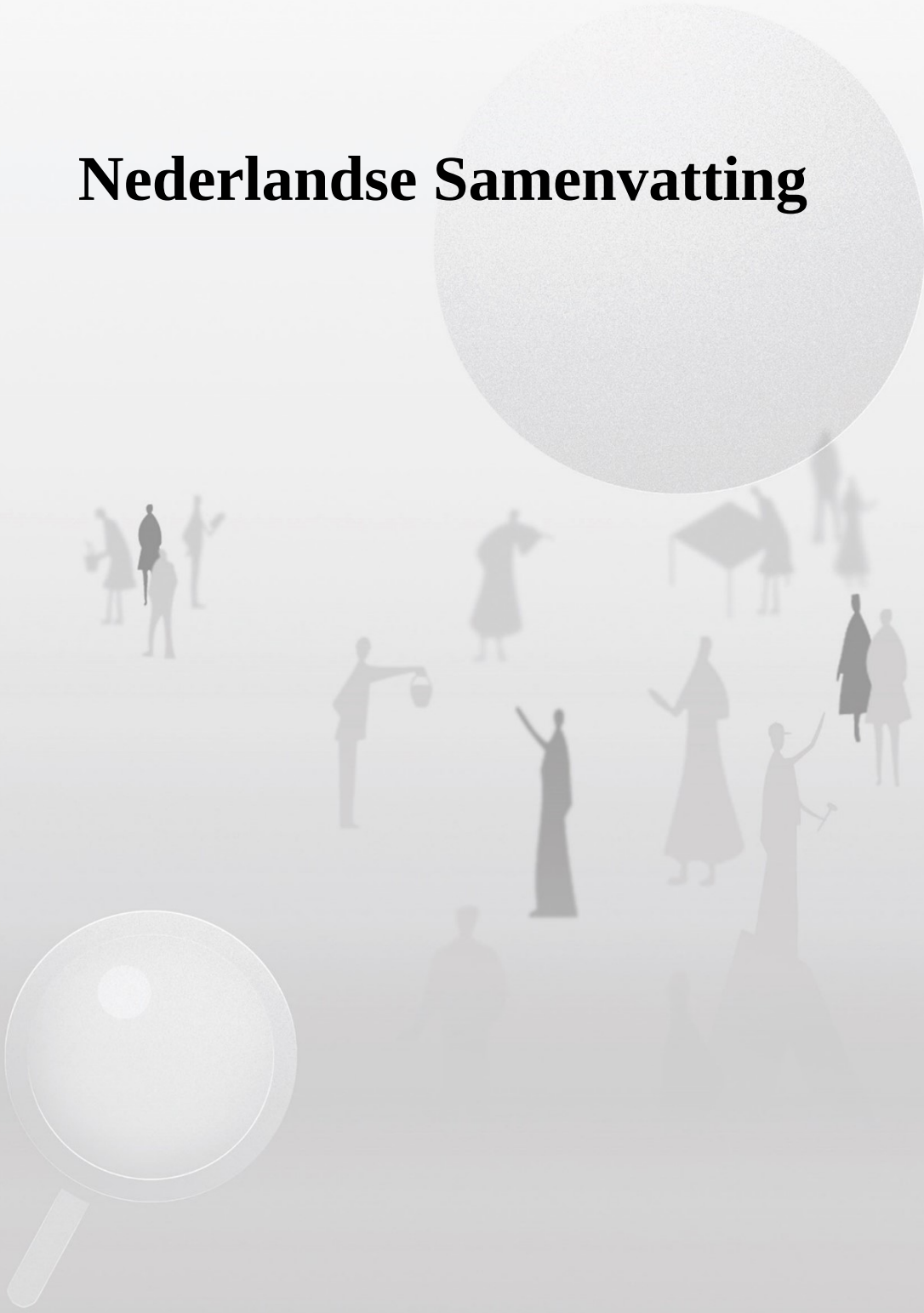
Finally, practical implications were elaborated with consideration of work placement stakeholders:

1) Vocational teachers. Since this dissertation provided an overview of vocational teachers' possible learning activities, goals, outcomes, and changes in practice, vocational teachers may get to know this to promote their learning during this programme.

2) School leaders. As factors influencing vocational teachers' learning and transfer of learning have been discovered in this dissertation, school leaders could make use of this to take measures to help or monitor vocational teachers' learning in work placement.

3) Programmer designers. This dissertation provided vocational teachers' learning process in work placement, which could inspire programme designers to consider how to improve this programme in the future.

Nederlandse Samenvatting



Vanwege de snelle veranderingen in het bedrijfsleven en in de samenleving zijn docenten in het beroepsonderwijs genoodzaakt om hun vakkennis en hun onderwijspraktijk up-to-date te houden. Daarom is voor docenten in het beroepsonderwijs niet alleen hun leren in de context van de school, maar ook hun leren in de context van het bedrijfsleven steeds belangrijker geworden. In verband met deze ontwikkelingen worden in diverse landen als Zweden, Frankrijk en China, stages in het bedrijfsleven georganiseerd (Andersson & Köpsén, 2015; Zaid & Champy-Remoussenard, 2015). Een stage in het bedrijfsleven kan worden omschreven als een programma voor voortdurende professionele ontwikkeling waarin docenten uit het beroepsonderwijs hun professionele expertise bijhouden door te participeren in "the vocational, work-life community of practice of their teaching subject" (Andersson & Köpsén, 2015, p.2). Hoewel de meerwaarde van stages in het bedrijfsleven in eerder onderzoek wordt onderschreven, is er nog niet veel bekend over hoe het leren van docenten tijdens hun stage plaatsvindt en hoe zij hun leerervaringen uit stages gebruiken voor hun onderwijs. Om een meer diepgaand inzicht te verkrijgen in het leren van docenten in de context van dergelijke programma's, richt dit proefschrift zich specifiek op leerprocessen van docenten in het beroepsonderwijs tijdens en direct na hun stage in het bedrijfsleven.

Hoofdstuk 1: Algemene inleiding

Stages in het bedrijfsleven zijn landelijk geïmplementeerd in het Chinese beroepsonderwijs. Sinds 2016 zijn alle docenten in het Chinese beroepsonderwijs verplicht om iedere vijf jaar gedurende ten minste zes maanden stage te lopen in het bedrijfsleven. Docenten in het beroepsonderwijs, programma-ontwikkelaars en schoolleiders ondervinden echter belemmeringen met betrekking tot deze stages. Deze barrières lijken vooral voort te komen uit een gebrek aan kennis over het leren van docenten uit het beroepsonderwijs in zulke programma's. Eerder onderzoek richtte zich met name op factoren die van invloed zijn op de deelname van docenten uit het beroepsonderwijs aan stages en zelden op de leerprocessen van docenten tijdens hun stages in het bedrijfsleven.

De context van dit proefschrift is het Chinese beroepsonderwijs en daaronder valt zowel middelbaar als hoger beroepsonderwijs. In vergelijking met het hoger beroepsonderwijs speelt het middelbaar beroepsonderwijs een meer fundamentele rol als het gaat om de instroom van nieuwe studenten vanuit opleidingen naar werk. In

China is het beroepsonderwijs grotendeels gebaseerd op schools leren en schoolcurricula worden doorgaans vormgegeven als een soort synthese van theoretische en praktische modules. Vandaar dat het belangrijk is dat docenten in het beroepsonderwijs beschikken over een ‘duale competentie’ die zowel gericht is op de context van ‘onderwijzen’ als op de context van ‘werken’. In dit kader is het concept van ‘duaal-gekwalificeerde docenten’ ontwikkeld en zijn stages in het bedrijfsleven geïntroduceerd. De beleidsgeschiedenis van deze stages begon met 'The Law on Vocational Education of People's Republic of China' welke is gepubliceerd in 1996 en waarin voor het eerst werd aangegeven dat bedrijven leermogelijkheden moeten bieden aan docenten in het beroepsonderwijs.

Om het leren van docenten uit het beroepsonderwijs tijdens hun stage in beeld te brengen zijn in dit onderzoek vier theoretische kaders gebruikt, op basis waarvan verschillende onderzoeksvragen zijn geformuleerd. Het eerste kader betreft de ‘expectancy-value theory’, ontwikkeld door Eccles et al. (1983), aan de hand waarvan de motivatie van docenten voor hun stage in het bedrijfsleven is onderzocht. Binnen de ‘expectancy-value theory’ worden succesverwachting en de waarde die iemand hecht aan een taak beschouwd als twee belangrijke motiverende componenten, die van invloed kunnen zijn op de keuze, volharding en prestatie van individuen. Ten tweede zijn categorieën gebruikt uit eerder onderzoek voor het conceptualiseren van leeractiviteiten in de context van school en van het bedrijfsleven om te kunnen exploreren hoe docenten uit het beroepsonderwijs leren tijdens en van hun stages. Ten derde is het model van Harland & Kinder (2014) gebruikt dat negen typen leeropbrengsten bevat met betrekking tot cognitie en gedrag. Aan de hand van dit model is in kaart gebracht wat de docenten leren van hun stages. Ten vierde is gebruik gemaakt van modellen uit eerder onderzoek naar ‘transfer of learning’ (Murphy & Tyler, 2005) waarmee factoren kunnen worden onderzocht die van invloed zijn op veranderingen in de onderwijspraktijk die docenten doorvoeren op basis van zij hebben geleerd tijdens de stage. Aan de hand van dergelijke modellen is onderzocht welke factoren voor docenten in het beroepsonderwijs faciliterend of belemmerd kunnen werken om zulke veranderingen door te voeren.

Dit onderzoek omvat vijf deelstudies. De eerste studie betreft een literatuuronderzoek waarin een overzicht wordt gegeven van onderzoek naar leeractiviteiten en leeropbrengsten van docenten in het beroepsonderwijs in diverse contexten. De overige vier deelstudies zijn empirisch van aard en specifiek gericht op

het leren van docenten uit het beroepsonderwijs tijdens en na hun stage in het bedrijfsleven. In hoofdstuk 3 staat relatie tussen de motivatie van docenten uit het beroepsonderwijs voor hun stage en hun actieve betrokkenheid bij hun stage centraal. Hoofdstuk 4 richt zich op leerprocessen van docenten uit het beroepsonderwijs in termen van leeractiviteiten, doelen en leeropbrengsten tijdens hun stage. In hoofdstuk 5 en hoofdstuk 6 wordt inzicht gegeven in de 'transfer of learning' waarbij respectievelijk kwalitatieve en kwantitatieve onderzoeksbenaderingen een rol spelen. De belangrijkste onderzoeksvragen per deelstudie zijn:

1. Wat zijn de professionele leeractiviteiten en leeropbrengsten van docenten uit het beroepsonderwijs in diverse typen contexten? (hoofdstuk 2)
2. Wat is de relatie tussen de motivatie van docenten uit het beroepsonderwijs voor hun stage en hun betrokkenheid bij de stage? (hoofdstuk 3)
3. Wat zijn de leeractiviteiten, doelen en leeropbrengsten van docenten uit het beroepsonderwijs tijdens hun stage? (hoofdstuk 4)
4. Wat is de impact van de stages op de onderwijspraktijk van docenten in het beroepsonderwijs en welke factoren zijn van invloed op deze impact? (hoofdstuk 5)
5. Welke factoren hebben een voorspellende waarde voor de 'transfer of learning' door docenten uit het beroepsonderwijs van hun leerervaringen tijdens de stage in het bedrijfsleven naar de context van de school? (hoofdstuk 6)

Hoofdstuk 2: Professioneel leren van docenten in het beroepsonderwijs: een systematisch literatuuronderzoek van het afgelopen decennium

In dit hoofdstuk wordt verslag gedaan van een systematisch literatuuronderzoek naar het professionele leren van docenten uit het beroepsonderwijs in verschillende contexten. Aangezien de hedendaagse samenleving snel verandert, wordt van docenten in het beroepsonderwijs verwacht dat zij hun professionele kennis en vaardigheden op peil houden. Zowel wetenschappers als praktijkprofessionals kunnen belang hebben bij het verkrijgen van meer inzicht in het professionele leren van docenten in het beroepsonderwijs. Het doel van deze studie is om een overzicht te geven van inzichten van de afgelopen tien jaar uit onderzoek naar het professionele leren van van docenten in het beroepsonderwijs. De onderzoeksvragen waren:

1) Hoe kunnen professionele leeractiviteiten van docenten beroepsonderwijs worden gekarakteriseerd?

2) Welke leeropbrengsten van het professionele leren van docenten in het beroepsonderwijs kunnen worden onderscheiden?

Om de onderzoeksvragen te beantwoorden, werd de relevante literatuur die tussen januari 2010 en augustus 2021 is gepubliceerd, doorzocht. Naar aanleiding van een verkennende zoektocht in de literatuur waarbij verschillende zoektermen in diverse combinaties werden uitgeprobeerd en de gevonden artikelen op basis van de uiteindelijke zoektermen eerst werden gescreend, zijn 54 artikelen meegenomen in de verdere analyse. Van de gevonden artikelen waren er 54 waarin leeractiviteiten werden beschreven en 37 artikelen waarin leeropbrengsten werden beschreven. Om de leeropbrengsten te categoriseren, werd het eerder genoemde model van Harland en Kinder (2014) gebruikt.

Met betrekking tot de leeractiviteiten van docenten in het beroepsonderwijs lieten de resultaten vier hoofdcategorieën zien, respectievelijk ‘vooraf gedefinieerde professionele ontwikkelingsprogramma's’, ‘zelfgestuurde/zelfgeïnitieerde activiteiten op school’, ‘samenwerkingsactiviteiten op school’ en ‘leeractiviteiten die op bedrijfsmatige werkomgevingen gebaseerd zijn’. De categorie van op de bedrijfsmatige werkomgevingen gebaseerde leeractiviteiten is uniek is voor docenten in het beroepsonderwijs. De andere drie categorieën zijn gebruikelijk voor het categoriseren van het leren van docenten in het algemeen. Deze indeling in hoofdcategorieën laat zien dat het professionele leren van docenten in het beroepsonderwijs kan plaatsvinden in diverse typen omgevingen en op zowel formele als informele manieren vorm kan krijgen. De contexten voor leren kunnen ‘schools’ of ‘academisch’ van aard zijn maar ook kenmerken hebben van een bedrijfsmatige werkomgeving. Per hoofdcategorie van leeractiviteiten werden op basis van de literatuur verschillende specifieke leeractiviteiten onderscheiden. Met betrekking tot de leeropbrengsten werden in de literatuurreview acht soorten onderscheiden, bestaande uit ‘kennis en vaardigheden’, ‘leeropbrengsten met betrekking tot de onderwijspraktijk’, ‘affectieve leeropbrengsten’, ‘congruentie van waarden’, ‘motivatie en houding’, ‘leeropbrengsten op organisatieniveau’, ‘bewustwording’ en ‘leeropbrengsten ten aanzien van leerlingresultaten’. Van deze categorieën werd het vaakst over ‘kennis en vaardigheden’ en ‘leeropbrengsten met betrekking tot de onderwijspraktijk’ gerapporteerd. Bovendien werden de meeste leeropbrengsten als positief geclassificeerd.

De resultaten van de reviewstudie bieden een theoretisch kader dat door

toekomstige wetenschappers kan worden gebruikt die onderzoek willen doen naar het leren van docenten in het beroepsonderwijs. Tevens biedt de reviewstudie suggesties voor beleidsmakers en schoolleiders om het professionele leren van docenten in het beroepsonderwijs te bevorderen.

Hoofdstuk 3: De relatie tussen de motivatie van docenten in het beroepsonderwijs voor een stage en hun betrokkenheid bij stage

In dit hoofdstuk wordt een kwantitatieve benadering gepresenteerd aan de hand waarvan de relatie is onderzocht tussen motivatie van docenten in het beroepsonderwijs voor een stage en de mate waarin zij actief betrokken zijn tijdens de stage. Hoewel stages in het bedrijfsleven voor docenten uit het beroepsonderwijs in China landelijk zijn geïmplementeerd, liet een aantal docenten een lage betrokkenheid zien tijdens hun deelname aan een dergelijk programma (Xun & Yang, 2019; Zhang & Fang, 2016). Daarbij kunnen externe factoren een rol spelen maar ook zouden interne factoren zoals de motivatie van docenten een belangrijke aanvullende verklaring kunnen bieden voor hun betrokkenheid. De volgende twee onderzoeksvragen stonden centraal:

1) Wat is de relatie tussen de motivatie van docenten in het beroepsonderwijs voor een stage en de mate van hun betrokkenheid bij eigen leerprocessen tijdens de stage?

2) Heeft onderwijservaring een modererend effect op deze relatie?

De ‘expectancy-value theory’ van Eccles et al. (1983) vormde het theoretisch kader voor het in kaart brengen van de motivatie van docenten. Ook is in dit deelonderzoek gebruik gemaakt van studies die zich richten op betrokkenheid bij het eigen leerproces en op de relatie tussen motivatie en betrokkenheid. In de meeste onderzoeken tot nu is een overwegend positief verband gevonden tussen motivatie en betrokkenheid (Jones, Johnson, & Campbell, 2015; Wang & Eccles, 2013). Onderzoek heeft tevens laten zien dat er verschillen kunnen bestaan tussen beginnende en ervaren docenten als het gaat om motivatie en betrokkenheid bij eigen leerprocessen.

Om data te verzamelen zijn 426 Chinese docenten uit het beroepsonderwijs uitgenodigd om de vragenlijst in te vullen. Er werden vier hoofdcomponenten in kaart gebracht: ‘taakwaarde’, ‘kostenafweging’, ‘vertrouwen in eigen kunnen’ en ‘betrokkenheid bij het eigen leerproces’. Op basis van een exploratieve factoranalyse konden vier factoren onderscheiden worden die te maken hebben met motivatie,

namelijk ‘taakwaarde’, ‘taakinspanning’, ‘emotionele kostenafwegingen’ en ‘vertrouwen in eigen kunnen’. Ook konden twee factoren worden onderscheiden die te maken hebben met betrokkenheid, namelijk een combinatie van gedragsmatige, cognitieve en emotionele betrokkenheid enerzijds en anderzijds een vorm betrokkenheid waarin docenten actief invloed uitoefenen op hun leren die als ‘agentic’ kan worden aangeduid. Verder werden multivariate lineaire regressieanalyses uitgevoerd om de relatie tussen motivatie en betrokkenheid te onderzoeken en tevens werd nagegaan of sprake was van een modererend effect van onderwijservaring.

De bevindingen lieten zien dat de percepties van de docenten met betrekking tot ‘taakwaarde’, ‘taakinspanning’ en ‘vertrouwen in eigen kunnen’ significant positieve voorspellers waren voor gedragsmatige, cognitieve en emotionele betrokkenheid van de docenten bij hun leerproces, terwijl emotionele kostenafwegingen een negatieve voorspeller bleken. Bovendien waren de percepties van docenten over ‘taakinspanning’, ‘vertrouwen in eigen kunnen’ en ‘emotionele kostenafwegingen’ positief gerelateerd aan hun betrokkenheid die als ‘agentic’ kon worden aangeduid. De moderatoranalyses lieten zien dat de onderwijservaring van docenten in het beroepsonderwijs een significant en negatief modererend effect had op de relatie tussen twee variabelen gerelateerd aan kostenafwegingen (namelijk taakinspanning en emotionele kostenafwegingen) en ook op gedragsmatige, cognitieve en emotionele betrokkenheid. Deze bevindingen suggereren dat naarmate de onderwijservaring korter is, het verband sterker is tussen enerzijds taakinspanning en emotionele kostenafwegingen, en anderzijds betrokkenheid bij eigen leerprocessen tijdens de stage in het bedrijfsleven (gedragsmatig, cognitief en emotioneel).

De bevinding dat ‘taakwaarde’ en ‘vertrouwen in eigen kunnen’ positieve voorspellers zijn van betrokkenheid bij eigen leerprocessen in de stage, komt overeen met de bevindingen in de meeste eerdere onderzoeken (Bandura 1997; Eccles et al., 1983; Jones et al., 2015; Zhang & Liu, 2019). De positieve relatie tussen de taakinspanning van docenten en hun betrokkenheid bij eigen leerprocessen die werd gevonden in het huidige onderzoek staat echter in schril contrast met de bevindingen in de meeste eerdere onderzoeken. Een mogelijke verklaring kan worden gevonden in inzichten uit de attributietheorie en eigenwaardetheorie (self-worth theory) vanuit Aziatisch perspectief. Met betrekking tot de attributietheorie hebben eerdere studies aangetoond dat in Aziatische culturen in het algemeen geldt dat hoe groter iemands verlangen is om te slagen of te verbeteren, hoe groter ook de inspanning is die men

beschouwt als zijnde nodig (Mizokawa & Ryckman, 1990). Vanuit de eigenwaardetheorie is door Jiang et al. (2018) de perceptie van de eigenwaarde door Oost-Aziatische studenten als verklaring gebruikt om uit te leggen waarom de kostenafwegingen van Koreaanse studenten positieve voorspellers kunnen vormen voor de mate waarin zij hun doelen nastreven. Volgens hun uitleg zijn studenten, wanneer ze de kosten als hoger inschatten, geneigd hogere prestatiedoelen na te streven om hun gevoel van eigenwaarde in stand te houden.

Hoofdstuk 4: Naar een beter begrip van de professionele ontwikkeling van docenten uit het beroepsonderwijs en hun leerprocessen tijdens stages in het bedrijfsleven: leerdoelen, activiteiten en opbrengsten

In dit hoofdstuk wordt gerapporteerd over een onderzoek naar de leerervaringen van docenten uit het beroepsonderwijs tijdens de stage in het bedrijfsleven. Hoewel het belang van stages in het bedrijfsleven wordt erkend door onderzoekers en praktijkprofessionals (Andersson & Köpsén, 2015; Zaid & Champy-Remoussenard, 2015), bestaat er nog steeds geen helder beeld van hoe het leren van docenten vorm krijgt tijdens stages in het bedrijfsleven en wat voor leeropbrengsten docenten uit dergelijke programma kunnen opdoen. Het doel van dit deelonderzoek was daarom om inzicht te geven in de leerprocessen van docenten in het kader van hun stage.

In deze studie werd gebruik gemaakt van bevindingen uit eerder onderzoek naar de professionele ontwikkeling van docenten om de leerprocessen in kaart te kunnen brengen. Daarbij werd niet alleen onderzoek naar de leeractiviteiten van docenten in ogenschouw genomen maar ook onderzoek naar de leeractiviteiten van professionals op de werkplek, omdat beide relevant kunnen zijn voor het onderzoek. Voor het conceptualiseren van leerdoelen en leeropbrengsten werd het eerdergenoemde model van Harland en Kinder (2014) met negen soorten leeropbrengsten gebruikt. De volgende onderzoeksvragen waren leidend voor deze studie:

1) Welke leeractiviteiten ondernemen docenten uit het beroepsonderwijs tijdens hun stage in het bedrijfsleven en in welke mate vinden zij deze activiteiten zelf belangrijk?

2) Welke leerdoelen en leeropbrengsten rapporteren docenten in het beroepsonderwijs naar aanleiding van hun stage?

3) Wat is volgens de docenten de relatie tussen hun leeractiviteiten en leeropbrengsten?

Om een goed beeld te krijgen van de leerprocessen van de docenten tijdens hun stage werden interviews gehouden met 27 docenten. Allemaal werden zij binnen een week na afronding van hun stage individueel geïnterviewd. Het semi-gestructureerde interviewprotocol bevatte drie thema's: 1) leeractiviteiten van de docenten tijdens de stage; 2) leerdoelen van de docenten voor hun stage; 3) verkregen leeropbrengsten van de docenten naar aanleiding van de stage, inclusief hun intenties voor de onderwijspraktijk. Het analyseschema werd ontwikkeld op basis van bestaande kaders voor leeractiviteiten en leeropbrengsten (Harland & Kinder, 2014; Meirink, Meijer, & Verloop, 2007).

De bevindingen resulteerden in zeven categorieën van leeractiviteiten, namelijk ‘taken uitvoeren’, ‘experimenteren’, ‘leren van begeleiding van de mentor’, ‘reflecteren’, ‘leren van anderen in interactie’, ‘leren van anderen zonder interactie’ en ‘formele training’. Het meest gerapporteerd werd ‘leren van anderen met en zonder interactie’, terwijl ‘leren van begeleiding van de mentor’, ‘leren van anderen met interactie’ en ‘formele training’ het vaakst als belangrijk werden beschouwd. Daarnaast werden in dit onderzoek twaalf categorieën van uitkomsten geïdentificeerd waarvan acht ook werden gerapporteerd als leerdoelen. Het ‘verwerven van kennis en vaardigheden’ was het meest voorkomende leerdoel dat werd gerapporteerd bij het volgen van een stage. Er konden zes categorieën van intenties tot verandering in de onderwijspraktijk op de eigen school worden onderscheiden. Ten slotte lieten de resultaten zien dat de categorieën van leeractiviteiten sterk gerelateerd waren met de leerresultaten, wat betekent dat iedere ondernomen leeractiviteit in potentie meer dan één type leeropbrengst kon opleveren.

De bevindingen over de leerervaringen van docenten tijdens hun stage in het bedrijfsleven komen sterk overeen met uitkomsten uit eerder onderzoek naar leren op de werkplek. De uitkomsten lijken erop te wijzen dat de docenten vooral waarde hechten aan het ontvangen van zowel gestructureerde als niet-gestructureerde ondersteuning van anderen in organisaties waar zij als lerende te gast zijn. Met betrekking tot leeropbrengsten werden verschillende categorieën ontwikkeld of aangepast vanuit het model van Harland en Kinder (2014) naar de context van stage.

Hoofdstuk 5: Beïnvloedende factoren die een rol spelen bij de impact van stages in het bedrijfsleven op de onderwijspraktijk van docenten

In dit hoofdstuk wordt verslag gedaan van een onderzoek naar de impact van stages

in het bedrijfsleven op de onderwijspraktijk van docenten op scholen voor middelbaar beroepsonderwijs en factoren die daarbij een rol spelen. Een effectief programma voor professionele ontwikkeling kan in potentie leiden tot veranderingen in de onderwijspraktijk van docenten. Tot nu toe is er echter geen onderzoek gedaan naar hoe docenten uit het beroepsonderwijs het geleerde tijdens hun stage toepassen op de werkplek van hun school. In dit deelonderzoek is een kwalitatieve benadering gebruikt om inzicht te krijgen in veranderingen in de onderwijspraktijk op basis van wat docenten hebben geleerd tijdens de stage.

De meer algemene literatuur over veranderingen die docenten teweeg brengen in de schoolpraktijk laat zien dat dat dergelijke veranderingen diverse verschijningsvormen kunnen hebben. Tevens blijkt uit onderzoek dat de door docenten beoogde veranderingen en de daadwerkelijke veranderingen in de praktijk niet altijd hetzelfde zijn. In de literatuur over ‘transfer of learning’ worden drie domeinen van factoren onderscheiden die invloed kunnen hebben op het doorvoeren van veranderingen door docenten in de onderwijspraktijk, namelijk ‘kenmerken van de leerling’, ‘ontwerpkenmerken van interventies’ en ‘kenmerken van de werkomgeving’ (Blume et al. 2010; De Rijdt et al. 2013).

De volgende onderzoeksvragen stonden in deze studie centraal:

1) Wat zijn de beoogde en daadwerkelijke veranderingen die docenten uit het bedrijfsleven doorvoeren in hun onderwijspraktijk naar aanleiding van hun stage in het bedrijfsleven?

2) Welke factoren ervaren de docenten als faciliterend of belemmerend voor het doorvoeren van veranderingen in hun onderwijspraktijk?

Ten behoeve van het onderzoek werd 18 docenten op twee momenten een semigestructureerd interview gehouden. De eerste interviewronde vond plaats binnen een week na afronding van de stage en had betrekking op de leerervaringen van de docenten tijdens de stage en hun geplande veranderingen in de onderwijspraktijk. De tweede interviewronde werd gehouden aan het einde van het semester na de stage en had als doel inzicht te verkrijgen in de daadwerkelijke veranderingen die docenten doorvoeren in de onderwijspraktijk en in factoren die van invloed zijn op het wel of niet doorvoeren van deze veranderingen.

Uit de resultaten kwamen zes categorieën van veranderingen in de onderwijspraktijk naar voren die ingedeeld konden worden in onder meer ‘schoolniveau’, ‘niveau van collega’s’ en ‘de individuele lespraktijk’. Wat betreft de vergelijking tussen de

beoogde en daadwerkelijke veranderingen bleek dat de meeste docenten hun veranderplannen in de praktijk ook daadwerkelijk verwezenlijkten. Verder kwamen uit het onderzoek dertien factoren naar voren die van invloed kunnen zijn op het daadwerkelijk doorvoeren van veranderingen in de onderwijspraktijk. Deze factoren konden worden onderverdeeld in drie domeinen, namelijk 'kenmerken van de docent', 'kenmerken van de stage in het bedrijfsleven' en 'kenmerken van de schoolomgeving'.

De resultaten bevestigden het beeld uit eerder onderzoek dat veranderingen in de schoolpraktijk verschillende vormen kunnen aannemen en ook verder kunnen gaan dan de individuele lespraktijk. De gevonden beïnvloedende factoren werden deels ook in eerdere studies gevonden, maar het huidige onderzoek geeft een rijker perspectief op deze factoren, bijvoorbeeld door het gebruik van het begrip 'perceived effects' ('waargenomen effecten'), waarmee aandacht wordt gevraagd voor de gezichtspunten van docenten ten aanzien van de effecten van de stages op veranderingen in de onderwijspraktijk.

Hoofdstuk 6: Factoren om 'transfer of learning' van docenten uit het beroepsonderwijs te voorspellen: een kwantitatief onderzoek in de context van stages in het bedrijfsleven

In dit hoofdstuk wordt verder ingegaan op factoren die verband kunnen houden met de 'transfer of learning' van docenten naar aanleiding van hun stage in het bedrijfsleven. 'Transfer of learning' verwijst naar processen waarin docenten gebruik maken van hun leerervaringen om veranderingen aan te brengen in de onderwijspraktijk (Murphy & Tyler, 2005). In hoofdstuk 5 zijn op basis van kleinschalig onderzoek reeds enkele factoren gerapporteerd die van invloed kunnen zijn op de 'transfer of learning'; het doel van het gerapporteerde onderzoek in hoofdstuk 6 was deze factoren op basis van grootschaliger onderzoek nader te onderzoeken.

Uitgaande van de drie domeinen van factoren genoemd in hoofdstuk 5 ('kenmerken van de docent', 'kenmerken van de stage in het bedrijfsleven' en 'kenmerken van de schoolomgeving') en bevindingen uit eerdere studies, werden diverse hypotheses geformuleerd. Daarbij werd er vanuit gegaan dat de tijdsduur van de periode ('transfer period') waarin het proces van verandering plaatsvond en de effecten van de stage zoals waargenomen door docenten zelf ('perceived effects') een modererend effect hebben op de 'transfer of learning'. Wat betreft 'transfer of learning'

werd in deze studie onderscheid gemaakt tussen ‘transfertoepassingen’ en ‘transferbehoud’. ‘Transfertoepassingen’ staat voor de verschillende manieren waarop docenten al bezig zijn geweest met het aanbrengen van veranderingen in hun onderwijspraktijk naar aanleiding van hun stage. ‘Transferbehoud’ verwijst naar de mate waarin docenten de intentie hebben om zich blijvend in te zetten voor veranderingen in de onderwijspraktijk. Er werden tien factoren onderscheiden die een voorspellende waarde hebben voor de ‘transfer of learning’, namelijk ‘onderwijservaring’, ‘ervaring in het beroepsdomein’, ‘de duur van de stageperiode’, ‘persoonlijke capaciteit’ (de mate waarin docenten tijd, mentale ruimte en energie hebben om veranderingen door te voeren), ‘inhoudelijke relevantie’, ‘ondersteuning door leidinggevenden’, ‘ondersteuning door collega's’, ‘gebruiksmogelijkheden’, (uitgaande van beschikbare faciliteiten), en waargenomen effecten (‘perceived effects’).

Er werd gebruik gemaakt van een enquête om gegevens te verzamelen en deze is door 372 docenten uit het Chinese beroepsonderwijs ingevuld. De items voor ‘transfer of learning’ werden ontwikkeld op basis van de resultaten van hoofdstuk 4 en 5. De items voor ‘persoonlijke capaciteit’, ‘inhoudelijke relevantie’, ‘ondersteuning door leidinggevenden’, ‘ondersteuning door collega's’ en ‘gebruiksmogelijkheden’ zijn overgenomen uit de ‘Learning Transfer System Inventory’ (LTSI). (Bates et al., 2012). De vier items voor waargenomen effecten (‘perceived effects’) werden ontwikkeld op basis van de kwalitatieve resultaten van hoofdstuk 5.

De resultaten lieten zien dat het model goed paste. Bevindingen naar aanleiding van pad-analyse toonden aan dat ‘ervaring in het beroep’, ‘persoonlijke capaciteit’, ‘inhoudelijke relevantie’, ‘ondersteuning door collega's’, ‘gebruiksmogelijkheden’ en ‘duur van de stageperiode’ positieve voorspellers waren voor ‘transfertoepassingen’, ofwel de mate waarin de docenten al bezig waren geweest met het aanbrengen van veranderingen in hun onderwijspraktijk naar aanleiding van hun stage. Bovendien bleek dat ‘transfertoepassingen’ en ‘waargenomen effecten’ positieve voorspellers waren voor de intentie van de docenten om te blijven werken aan de doorgevoerde veranderingen opdat deze blijven bestaan (‘transferbehoud’). Bovendien was er geen sprake van een modererend effect van de transferperiode en waargenomen effecten, zoals aanvankelijk verondersteld.

Deze bevindingen bieden empirisch bewijs voor factoren die verband houden

met de ‘transfer of learning’ door docenten in het beroepsonderwijs in de context van hun stage in het bedrijfsleven. De resultaten komen deels overeen met bevindingen uit eerder onderzoek. Een onverwachte uitkomst was dat ‘onderwijservaring’ en ‘ondersteuning door leidinggevenden’ geen voorspellende waarde hadden voor het aanbrengen van veranderingen in de onderwijspraktijk door de docenten. Onderwijservaring was wellicht geen relevante voorspeller omdat de stagecontext voor alle docenten onbekend was, waardoor zij mogelijk voor dilemma’s kwamen te staan bij het overbrengen van het geleerde vanuit de stage naar de eigen onderwijspraktijk, ongeacht of zij beginnende of ervaren docenten waren. De bevinding dat ‘ondersteuning door leidinggevenden’ geen voorspellende waarde had, kan mogelijk worden verklaard doordat deze ondersteuning zelden werd ervaren. De bevinding dat er geen sprake was van een modererend effect van de transferperiode en waargenomen effecten lijkt erop te wijzen dat de invloed van de stage in het bedrijfsleven op de onderwijspraktijk van de docenten vrij sterk was en lange tijd kon aanhouden.

Hoofdstuk 7: Discussie en conclusie

In het laatste hoofdstuk worden de bevindingen uit de vijf studies in dit proefschrift samengevat en bediscussieerd. Vervolgens worden de belangrijkste beperkingen van dit proefschrift en mogelijke richtingen voor toekomstig onderzoek besproken. Ten slotte worden ook praktische implicaties beschreven voor docenten in het beroepsonderwijs, schoolleiders en programma-ontwikkelaars.

Op basis van de belangrijkste bevindingen worden de volgende drie aspecten besproken:

1) De effectiviteit van de stage in het bedrijfsleven. Aangezien de resultaten van de hoofdstukken 4, 5 en 6 een verscheidenheid aan leeropbrengsten met betrekking tot cognitie en gedrag hebben opgeleverd, kwamen we tot de slotsom dat deze stages effectieve programma’s kunnen bieden voor de professionele ontwikkeling van docenten in het beroepsonderwijs.

2) Leren van docenten in het beroepsonderwijs en hun betrokkenheid bij hun stages. Uit de bevindingen van hoofdstuk 3 en 4 blijkt dat de docenten konden participeren in verschillende formele en informele activiteiten tijdens hun stage en dat hun motivatie voor de stage een belangrijke factor vormt in relatie tot hun betrokkenheid bij de stage. Deze inzichten kunnen behulpzaam zijn om leerprocessen

van docenten uit het beroepsonderwijs beter te begrijpen.

3) Factoren die van invloed zijn op de 'transfer of learning' van het geleerde tijdens de stage naar context van de school. De resultaten van hoofdstuk 5 en 6 bieden inzicht in factoren die verband houden met de 'transfer of learning' door docenten naar aanleiding van de stages en deze factoren kunnen worden onderverdeeld in de drie domeinen 'kenmerken van de docent' ,'kenmerken van de stage' en 'kenmerken van de schoolomgeving'.

Het onderzoek kent ook een aantal beperkingen. Een eerste beperking is dat alleen zelfrapportagegegevens van docenten zijn gebruikt voor de empirische studies, wat een enigszins beperkt beeld kan geven. Een tweede beperking is dat in dit onderzoek alleen docenten uit het middelbaarberoepsonderwijs zijn betrokken en geen docenten uit het hoger beroepsonderwijs. Een derde beperking is dat alleen cross-sectionele gegevens zijn verzameld voor de kwantitatieve studies en geen longitudinale data. Op basis van onder meer deze beperkingen worden in hoofdstuk 7 suggesties voor toekomstig onderzoek gedaan.

Ten slotte zijn praktische implicaties uitgewerkt met inachtneming van diverse belanghebbenden bij stages in het bedrijfsleven:

1) Docenten uit het middelbaar beroepsonderwijs. De bevindingen uit het proefschrift ten aanzien van de mogelijke leeractiviteiten, doelen, opbrengsten en veranderingen in de onderwijspraktijk, kunnen docenten inspiratie bieden voor hun eigen leerproces tijdens hun stage in het bedrijfsleven.

2) Schoolleiders. Dit proefschrift biedt inzicht in factoren die van invloed zijn op het leren en de 'transfer of learning' van docenten in het beroepsonderwijs waarvan schoolleiders gebruik kunnen maken om maatregelen te nemen ten behoeve van het ondersteunen en monitoren van de leerprocessen die docenten doormaken tijdens hun stage in het bedrijfsleven.

3) Programma-ontwikkelaars. De inzichten over het leerproces van docenten in het beroepsonderwijs tijdens hun stage zoals beschreven in dit proefschrift, kunnen programma-ontwerpers inspireren om na te denken over hoe programma's voor deze stages in de toekomst kunnen worden verbeterd.

总结

随着行业和社会的发展，职校教师需要不断提升他们的专业能力和教学实践。除了校内学习，企业学习对于职校教师也变得越来越重要。在这样的背景下，企业实践已经在很多国家得到开展，比如瑞典、法国和中国(Andersson & Köpsén, 2015; Zaid & Champy-Remoussenard, 2015)。企业实践被定义为一项职校教师专业发展项目，在这一项目中，职校教师通过参与“与他们所教学科相关的职业、企业实践共同体”来提升他们的专业能力(Andersson & Köpsén, 2015, p.2)。虽然企业实践价值已经得到许多学者的认可，但有关职校教师如何在该项目中学习以及他们如何利用企业实践的学习经历尚未明确。为了深入了解职校教师在该项目中的专业化学习，本研究将聚焦于职校教师在企业实践中的学习过程。

第 1 章：概述

在中国职业教育中，企业实践已得到全国范围内的实施，并且自 2016 年，所有职校教师被要求每五年一个周期至少参加六个月企业实践。然而，对于职校教师、企业实践项目设计者和学校领导者来说，职校教师参加企业实践存在诸多困难和挑战，而似乎这些困难和挑战都源于他们对职校教师在企业实践中的学习缺乏认识和理解。前人的研究已经试图探究了影响职校教师参加企业实践的因素，然而极少有研究关注教师在企业实践中的学习。

本研究的背景聚焦中国职业教育。中国职业教育主要包含中等职业教育和高等职业教育。相比于高等职业教育，中等职业教育在引导学生从学校走向工作场所中扮演了更重要的角色。在中国，职业教育是典型以学校为主导的，学校课程通常是理论和实践相结合。因此，职校教师必须同时拥有关于理论教学和实践教学的“双师型能力”。在这一背景下，“双师型教师”的概念被提出并且企业实践也得到广泛实施。有关企业实践的政策历史最早可以追溯到 1996 年颁布的《中华人民共和国职业教育法》，该法律文件第一次提出企业应当为职校教师提供更多的学习机会。

为了探究职校教师在企业实践中的学习，我们针对不同的研究问题，采用了四种理论框架。首先，Eccles et al. (1983) 提出的期望——价值理论被用于测量职校教师对企业实践的动机信念。在该理论模型中，对成功的期望和对价值

的认知被认为是两个重要的动机组成部分，并且影响者个体的选择、坚持和成就。第二、为了探究职校教师在企业实践中的学习活动，我们综述了过往文献对学校和企业工作场所学习活动的研究结果。第三，为了调查职校教师企业实践的学习效果，我们采用了 Harland & Kinder (2014)提出的学习效果模型，该模型包含九类不同的学习效果，涉及认知、情感和行为层面。第四，为了检验促进或者阻碍职校教师将企业实践所学应用到教学实践中的因素，我们总结了过往关于影响学习迁移的因素模型。

基于对企业实践的背景和前人理论框架的描述，我们设计了 5 个子研究。第 1 个子研究是文献综述，回顾了职校教师在不同情境下的学习活动和效果。之后的四个子研究从实证角度聚焦于职校教师在企业实践中的学习。具体而言，第 3 章节探究了职校教师对于企业实践的动机信念和学习投入程度。第 4 章节调查了职校教师在企业实践中的学习过程，包括学习活动、目标和效果。进一步的，第 5 章节和第 6 章节分别从质性和量化视角探究了职校教师如何将企业实践所学应用到学校工作场所。针对每个子研究的主要研究问题如下：

1. 职校教师在各类情境下的学习活动和学习效果有哪些？ (第 2 章节)
2. 职校教师对企业实践的动机信念和学习投入之间的关系是什么？(第 3 章节)
3. 职校教师在企业实践中的学习活动、目标和效果有哪些？(第 4 章节)
4. 企业实践对职校教师教学实践的作用及其影响因素有哪些？(第 5 章节)
5. 哪些因素能够预测职校教师在多大程度上可以将企业实践所学应用到学校工作中？(第 6 章节)

第 2 章：职校教师的专业化学习：对过去十年的系统性文献综述

在这一章节中，我们用文献综述的方式来探究职校教师在不同情境下的学习。由于现代社会的快速发展，职校教师被期望能够及时更新他们的专业和教学能力。有关职校教师的专业化学习已经得到了诸多学者和教育实践者的关注。本研究旨在概括职校教师在过去十年的专业化学习经历。具体的研究问题是：

1） 职校教师的专业化学习活动有哪些？

2） 职校教师的专业化学习效果有哪些？

为了回答上述问题，我们用下列检索关键词检索了从 2010 年 1 月到 2021

年 8 月的文献：“题目”包括“专业化发展”或“专业化学习”或“教师培训”或“教师学习”加“任意位置”包括“职校教师”或“VET 教师”。在进行严格的文献筛选后，54 篇文章被纳入到最终分析当中。其中，54 篇文章都描述了职校教师的学习活动，而只有 37 篇文章描述了职校教师的学习效果。为了识别职校教师的学习效果，Harland and Kinder (2014)提出的学习效果模型被应用于分析过程。

针对职校教师的学习活动，研究结果总结出四个主要的类别，分别为定制化的专业发展项目、校内的自我引领式学习、校内的协作式学习、以及基于行业的学习。这些活动类型证实了职校教师的专业化学习可以以正式或非正式的方式发生在学术、行业企业和学校工作场景中。对于每一类别，又有许多具体的学习活动。除了只针对职校教师的基于行业的学习，其他三类学习活动对于非职业学校的教师也同样适用。关于职校教师的学习效果，本研究总结出八类学习效果，包括知识技能、教学实践、情感效果、价值认同、动机和态度信念、组织效果、新的见解以及学生成绩。在这些类别之中，知识技能和教学实践被认为是最常见的学习效果。总的来说，大部分学习效果都被认为是积极的。

本研究的结果展示了职校教师在过去十年的主要学习活动和效果，这可以为未来的学者探究职校教师的专业化学习提供理论框架。并且，研究结果也为政策制定者和学校领导者就如何促进职校教师专业化学习提供了建议。

第 3 章：职校教师参与企业实践的动机信念与其学习投入之间的关系

本章节采用量化研究方法来探究职校教师对于参与企业实践的动机信念与其学习投入之间的关系。尽管企业实践已经在中国得到全国范围内的实施，许多教师在企业实践过程中仍表现出较低的投入度(Xun & Yang, 2019; Zhang & Fang, 2016)。除了外部原因，教师的内在动机或许也可以为此提供解释。因此，本研究主要探究以下两个研究问题：

1） 职校教师对于企业实践的动机信念和学习投入之间的关系是什么？

2） 职校教师的教龄对此关系有调节作用吗？

在理论框架部分，首先，采用 Eccles et al (1983)提出的期望——价值理论来解释职校教师参与企业实践的动机信念。第二，综述了过往关于学习投入以

及学习投入与动机信念关系的文献，结果发现大部分研究证实两者在一定程度上存在积极关系(Jones, Johnson, & Campbell, 2015; Wang & Eccles, 2013)。第三，总结了前人关于教龄如何影响学习投入与动机信念的关系并发现新手教师和熟手教师有很大的差异。除了综述过往文献，对中国职业教育背景下的企业实践开展情况也进行了描述。

为收集数据，426 名中等职业学校的教师作为参与者填写问卷。问卷主要包含四个部分：任务价值、成本、自我效能感和学习投入。基于探索性因子分析结果，产生了四个动机信念（任务价值、任务付出、情感成本和自我效能感）和两个学习投入（行为、认知和情感的综合投入和主动性投入）因子。之后，多元线性回归分析和调节分析分别被用于探究动机信念和学习投入的关系以及教龄的调节作用。

结果表明，职校教师对于企业实践的任务价值、任务付出和自我效能的感知能正向显著预测他们在企业实践中的行为、认知和情感的综合投入，而情感成本的认知有显著负向预测作用。此外，职校教师的任务付出、自我效能和情感成本感知与他们的主动性投入存在显著正向关系。调节效果检验结果证实，教师的教龄对于两个动机信念（任务付出和情感成本）与行为、认知和情感的综合投入的关系具有显著负向调节作用。这说明在企业实践背景下，教龄越低，两者之间的关系越强。

本研究中关于任务价值和自我效能感与职校教师在企业实践中的投入显著相关的结果与大部分前人的研究结果是一致的(Bandura 1997; Eccles et al., 1983; Jones et al., 2015; Zhang & Liu, 2019)。然而，职校教师的任务付出与他们的学习投入之间的负向关系却与之前的研究是相反的，这或许可以从亚洲文化视角下的归因理论和自我价值理论来解释。就归因理论而言，前人的研究已经表明在亚洲文化背景下，一个人越想要成功或成长，他感知到需要努力的程度就越高(Mizokawa & Ryckman, 1990)。就自我价值理论来说，Jiang et al. (2018) 在他们的研究中从亚洲学生关于自我价值的感知来解释学生感知的成本为何能够正向预测他们的目标。根据他们的解释，当学生感知到更高的成本时，他们会采用更高的目标，来保持他们的自我效能感。教龄的调节作用也可以从新手教师与熟手教师不同的学习经历来解释。

第 4 章：理解职校教师在企业实践中的专业发展：学习目标、活动和效果

在这一章节中，我们探究了职校教师在企业实践中的学习经历。尽管企业实践已经得到过往学者和教育实践者的肯定(Andersson & Köpsén, 2015; Zaid & Champy-Remoussenard, 2015), 但关于职校教师在企业实践中是如何进行学习的并且他们从企业实践中获得了哪些成果尚不清晰。因此，本研究旨在剖析职校教师在企业实践中的学习过程。

除了对在中国职业教育背景下企业实践的基本描述，我们还综述了前人关于教师专业发展方面的研究结果。有关学习活动，除了教师的学习活动，雇工在企业工作场所中的学习活动也被纳入进来。对于学习目标和效果，我们采用了 Harland and Kinder (2014)提出的学习效果模型，共包含九类学习效果。此外，我们也关注了学习活动和学习效果之间的关系。基于综述结果和本研究的目的，我们提出了下列三个具体的研究问题：

1） 职校教师在企业实践中的学习活动有哪些并且哪些活动被他们认为是重要的？

2） 职校教师对于企业实践的学习目标和效果有哪些？

3） 职校教师如何感知学习活动与学习 1 效果之间的关系？

为了全面理解职校教师在企业实践中的学习过程，我们对 27 位中等职业教育教师进行半结构化访谈。他们分别在完成企业实践后一周内被采访。采访提纲主要聚焦于三个主题：1）职校教师在企业实践中参与的学习活动；2）职校教师对参加企业实践设定的学习目标；3)职校教师从企业实践中获取的成果，也包括他们对于后续教学实践的展望。为分析数据，我们从前人研究中提取出关于学习活动和学习效果的两个编码簿(Harland & Kinder, 2014; Meirink, Meijer, & Verloop, 2007)。编码生成的类别具有良好的信度和效度。

研究结果发现了七个类别的学习活动，分别是顶岗工作，个人尝试、师傅带教、 反思、与他人交流、观察与阅读、正式培训。在这些活动当中，与他人交流、观察与阅读是最常见的活动，而师傅带教、与他人交流以及正式培训则最常被职校教师认为是重要的学习活动。此外，研究发现了十二类学习效果，并且其中的八类也被职校教师作为学习目标。基于访谈结果，获取知识和技能

被认为是职校教师参加企业实践最常见的学习目标。除此之外，研究还总结了六类职校教师试图在教学实践中的改变。最后，研究结果表明几乎所有的学习活动均与多类学习效果相关，这意味着职校教师从每一类活动中都能得到不止一种学习效果。

本研究的结果为我们展示了职校教师在企业实践中的学习经历。有关职校教师企业实践学习活动与过往关注工作场所学习活动的研究结果比较一致。并且，职校教师特别重视来自企业实践的组织者及其他参与者的支持与帮助。有关学习效果，有七类学习效果是从 Harland and Kinder (2014)的模型发展而来的。

第 5 章：影响企业实践对职校教师教学实践发挥作用的因素

在这一章节中，我们探究了企业实践对职校教师教学实践的作用以及影响其作用发挥的因素。众所周知，一个有效的专业发展项目可以促使职校教师去改变和提升他们的教学实践。由于目前尚未有研究揭示职校教师如何将企业实践所学应用到学习工作中，本研究将会从质性研究视角来进行探索，旨在加强我们对职校教师企业实践学习的理解。

在描述中国职业教育背景下的企业实践之后，我们概述了前人关于教师教学实践变化的研究并生成了两个主要观点。第一个是教师在教学实践中的变化是涉及多种形式的，另一个是教师计划发生的改变与实际发生的改变并不总是一致的。此外，我们还总结了前人关于影响教师将所学运用到实践中的因素，也就是影响学习迁移的因素。总的来说，影响学习迁移的因素主要可以分为三个类别：教师个人特质，学习活动设计和工作场所环境 (Blume et al., 2010; De Rijdt et al., 2013)。基于上述所说，我们提出了两个研究问题：

1） 企业实践后，职校教师针对教学实践计划和实际做出的改变有哪些？

2） 有哪些因素影响职校教师做出这些改变？

为了全面理解职校教师在教学实践中的变化，我们对 18 名中等职校教师进行了两次半结构化访谈。第一次访谈发生在职校教师刚完成职业实践的一周内，访谈的内容涉及职校教师在企业实践中的学习经历以及他们计划在接下来的教学实践中做出的改变。第二次访谈发生在职校教师回到教学岗位的一学期

之后，访谈内容关注职校教师利用企业实践经历对教学实践做出的真实改变以及影响他们做出改变的因素。

研究结果发现了六类职校教师在教学实践中的改变，涉及三个层次：学校、教师群体和教师个人。此外，通过比较计划改变与实际改变，我们发现大部分职校教师可以实现他们针对教学实践做出的改变计划。关于影响他们做出改变的因素，研究概括了十三个因素，主要分为三个类别：教师个人特质、企业实践项目和学校工作环境。

本研究对于教学实践变化的探究结果证实了职校教师的改变有多种形式而不是只聚焦于个人教学。有关教学实践变化的影响因素，尽管其中的部分因素已经被前人证实，仍然有多个因素由本研究首次提出，比如效果感知。

第 6 章：职校教师学习迁移的预测因素：在企业实践背景下的量化研究

本章节从量化视角探究与职校教师学习迁移有关的因素。学习迁移是教师利用学习经历对教学实践做出改变的过程 (Murphy & Tyler, 2005)。虽然第 5 章已经探究了影响学习迁移的因素，但其是在很小的样本群体中。因此，本研究的目的就是在更大的样本群体中去验证他们。

基于前人和第 5 章节的研究结果，我们从三个类别（教师个人特质、企业实践项目和学校工作环境）中选取了主要因素并且建立了假设。学习迁移在本研究中被分为迁移的生成和迁移的保持。本研究纳入了十个因素，分别是教龄、企业工作时间、企业实践时间、个人能力、内容相关度、上级支持、同事支持、应用机会和感知效果。并且，针对上述关系，我们还建立了两个关于迁移时间和效果感知的调节效果假设。

本研究采用了调查问卷来收集数据，共 372 名中等职业教育教师完成了问卷的填写。有关学习迁移的题目主要来自于第 4 和第 5 章节的研究结果，而有关个人能力、内容相关度、上级支持、同事支持和应用机会的题目主要来自于对 Learning Transfer System Inventory (LTSI) (Bates et al., 2012)量表的改编。此外，有关效果感知的题目主要来自于第 5 章节的质性研究结果。

经分析，测量模型具有良好的模型适配度。路径分析结果表明职校教师对个人能力、内容相关度、同事支持、应用机会的感知，企业工作时间以及企业

实践时间与他们的学习迁移的生成显著相关。此外，我们发现职校教师的学习迁移生成和效果感知能显著预测他们对学习迁移的保持意向。有关学习迁移时间和效果感知的调节作用并没有得到证实。

本研究的结果有力证实了影响职校教师将企业实践所学迁移到工作中的因素。其中部分因素已经在前人的研究中得到证实，还有一部分作为新的因素被提出，比如企业工作经历（时间）。此外，我们发现教龄和上级支持对于职校教师的学习迁移并没有预测作用。关于前者可能是因为无论是新手教师还是熟手教师，他们对企业环境都不熟悉，这就导致了他们都会面临迁移困境。对于后者的解释则是职校教师很少得到上级的支持。此外，迁移时间和效果感知的非调节作用也说明企业实践对职校教师教学实践的影响是强而有力且持续稳定的。

第 7 章：讨论和总结

在最后一个章节中，我们对于前五个子研究展开了讨论。首先，我们总结了这五个子研究的主要结果。然后，对这些结果进行了进一步的讨论。接下来，对本研究的局限性和对未来的研究方向进行了反思与展望。最后，对职校教师、学校领导者和企业实践项目设计者提供了实践建议。

基于主要的研究结果，我们讨论了以下三方面内容：

1） 企业实践的有效性。由于第 4、5、6 章节概括了职校教师涉及认知和行为的不同类型的学习效果，我们认为企业实践对于职校教师来说是一个有效的专业发展项目。

2） 职校教师在企业实践中的学习和投入。第 3 和 4 章节揭示了职校教师在企业实践中可以采用各种正式与非正式的学习活动并且发现他们的动机信念与他们在企业实践中的学习投入有显著关系，这强化了我们对职校教师企业实践学习的认识和理解。

3） 影响职校教师将企业实践所学应用到学校工作中的因素。第 5 和 6 章节探索与检验了与职校教师学习迁移相关的因素，主要包含三个类别：教师个人特质、企业实践项目和学校工作环境。

本论文主要有三个局限性。第一是我们在实证研究中仅将职校教师的自我

报告作为数据来源，这容易导致研究结果的偏差。第二是研究将中等职业教育教师作为样本，而高等职业教育教师并未考虑其中。第三个是在量化研究中我们只采用了横截面数据而没有采用追踪数据。基于上述几个缺点，我们对后续研究提出了几项建议。

最后，针对企业实践的利益相关者我们提出了以下几点实践建议：

1） 职校教师：既然研究概括了职校教师在企业实践中的学习活动、目标、效果和教学实践变化，职校教师应当充分利用上述内容来促进他们在企业实践中的学习。

2） 学校领导者：因为研究已经发现了影响教师学习和迁移的因素，学校领导可以据此采取措施来帮助或者监督职校教师在企业实践中的学习。

3） 项目设计者：本研究描述了职校教师在企业实践中的学习过程，可以激励项目设计者思索如何提升该项目的设计质量。

Appendices

Appendix A. Studies coded by learning activities and outcomes (Chapter2)

	Learning activities				Learning outcomes							
	Pre-defined professional development programme	Self-directed/ initiated activities in school	Collaborative activities in school	Industry -based activities	Knowledge and skills	Teaching practice	Affective outcomes	Value congruence	Motivational and attitudinal beliefs	Institutional outcomes	New awareness	Student outcomes
1.Alhanachi et al. (2021)			+		+	+-		+			+	
2.Andersson et al. (2018)	+	+		+	+	+				+		
3.Andersson and Köpsén (2015)	+			+								
4.Andersson and Köpsén (2018)	+	+		+	+	+				+		
5.Andersson and Köpsén (2019)				+		+			+	+		+
6.Bound (2011)	+							+	+			
7.Bouwmans et al. (2019)	+		+									
8.Broad (2016)	+		+	+	+	+		0		+		
9.Bükki and Fehérvári (2021)			+									
10.Castaño-Muñoz et al. (2018)	+											
11.Chatigny et al. (2012)	+	+		+			+					
12.Cochrane and Narayan (2011)	+				+	+		+				
13.Csíkos et al. (2018)	+	+	+									
14.De Jong et al. (2021)			+		+	+						

(Continued)

	Learning activities				Learning outcomes							
	Pre-defined professional development programme	Self-directed/ initiated activities in school	Collaborative activities in school	Industry -based activities	Knowledge and skills	Teaching practice	Affective outcomes	Value congruence	Motivational and attitudinal beliefs	Institutional outcomes	New awareness	Student outcomes
15.de Paor (2018)	+											
16.Hodes et al. (2011)	+				+	+	+	+				
17.Hoekstra and Crocker (2015)		+	+									
18.Hoekstra and Newton (2017)	+		+	+								
19.Hoekstra et al. (2018)	+	+	+	+	+	+					+	
20.Iqbal et al. (2020)	+					+						
21.Ketelaar et al. (2014)		+	+			+		+			+	
22.Kunst et al. (2018)	+	+	+									
23.Lahiff (2015)	+											
24.Lloyd and Payne (2012)	+	+	+	+			+					
25.Messmann et al. (2010)		+				+						
26.Oude Groote Beverborg, Sleegers, et al. (2015a)		+	+									
27.Oude Groote Beverborg, Sleegers, et al. (2015b)		+	+									

(Continued)

	Learning activities				Learning outcomes							
	Pre-defined professional development programme	Self-directed/ initiated activities in school	Collaborative activities in school	Industry -based activities	Knowledge and skills	Teaching practice	Affective outcomes	Value congruence	Motivational and attitudinal beliefs	Institutional outcomes	New awareness	Student outcomes
28.Oude Groote Beverborg, Sleegers, Endedijk, et al. (2015)		+								-		
29.Oude Groote Beverborg et al. (2020)			+							+		
30.Runhaar et al. (2010)		+	+									
31.Runhaar et al. (2014)		+	+							+		
32.Sandal (2021)	+				+	+		+	+	+		
33.Sandford et al. (2011)		+	+									
34.Saunders (2012)	+	+				+	+					
35.Saunders (2013)	+	+	+			+	+					
36.Schaap and De Bruijn (2018)			+			+				+-		+-
37.Schmidt (2019)				+								
38.Sirk et al. (2016)	+	+	+	+								
39.Smets and Struyven (2020)	+					+	+	+	+			
40.Sumaryanta et al. (2019)	+				+							

(Continued)

	Learning activities				Learning outcomes							
	Pre-defined professional development programme	Self-directed/ initiated activities in school	Collaborative activities in school	Industry -based activities	Knowledge and skills	Teaching practice	Affective outcomes	Value congruence	Motivational and attitudinal beliefs	Institutional outcomes	New awareness	Student outcomes
41.Tigelaar and Sins (2020)	+				0							
42.Vangrieken et al. (2016)			+							+		
43.Verberg et al. (2013)	+				+	+	+				+	+
44.Verberg et al. (2015)	+										+	
45.Virkkula and Nissilä (2014)				+	+	+			+	+		
46.Voerman et al. (2015)	+					+						
47.Warwas and Helm (2018)			+			+						
48.Watzek and Mulder (2019)			+									
49.Widmann and Mulder (2020)			+							+		
50.Wijnia et al. (2016)			+			+				+		
51.Winberg and Pallitt (2016)	+					+		+				
52.Winters et al. (2012)	+					+						
53.Zeggelaar et al. (2018)	+				0	+	+					
54.Zeggelaar et al. (2020)	+				0		+					
Totals	32	19	26	12	15	25	9	9	5	13	5	3

Appendix B: Questionnaire (Chapter 3)

Dear participants,

The aim of work placement is keeping up-to-date with your vocational knowledge and skills. In order to improve the effectiveness of work placement and study how vocational teachers' can be supported in work placement, ICLON Leiden University and CDIBB Tongji University are conducting a research project.

This questionnaire is part of the research project, which asks your perceptions of motivation and engagement toward work placement. It is expected that the questionnaire will take 10-15 minutes to complete. Your input is very valuable to us as a research team and can contribute to future work placement of vocational teachers.

Your participation in this research is voluntary and you may also withdraw consent at any time. The information provided will be used solely for the purpose of this research project. The results of the questionnaire will be treated confidential and results will always be made anonymous when reported. The data will be kept securely in Leiden University. If you have any questions or suggestions, feel free to send e-mail to this address: n.zhou@iclon.leidenuniv.nl.

1. Are you female or male? ( )
   A. Female B. Male
2. How old are you? _____
3. What is the highest level of formal education you have completed? ( )
   A. Diploma of secondary vocational school B. Senior college degree
   C. Bachelor D. Master E. Doctorate
4. How many years of teaching experience do you have? _____
5. How many years of occupational experience do you have before becoming a teacher? _____
6. What subject do you teach? _____
7. When was the last time you attended work placement? _____
8. How many days do you plan to do work placement in the next year? _____

This part is your perception of task value and self-efficacy for work placement. Please indicate below in what extent you think it's applicable with the following items: from 1 (It's not applicable to me at all) to 7 (It's completely applicable to me).

1. Doing well in work placement will be important for my future career.
2. What I learn in work placement helps me in my teaching.
3. Having experience of work placement is valuable because it will help me in my future career.
4. I'm certain I can master the skills being presented in work placement.
5. The things I learn in work placement are practical for me to know.
6. I like work placement.
7. It is important to me to be someone who does well in work placement.
8. I believe I will learn a lot in work placement.
9. What I learn in work placement is so important for me.
10. What I am learning in work placement is exciting to me.
11. To succeed as a vocational teacher, work placement is necessary.
12. Doing well in work placement is an important part of who I am.
13. What I am studying in work placement fascinates me.
14. Experience with work placement will be useful for me later in life.
15. I enjoy what I am learning in work placement.
16. I'm confident I can do an excellent job in work placement.
17. I'm certain I can understand the most work content presented in work placement.
18. It is important to me to be a person who have experience of work placement.
19. I enjoy work placement.
20. Having experience of work placement is an important part of who I am.
21. Being someone who does well in work placement is important to me.
22. I think I will do well in work placement.

This part is your perception of cost for work placement. Please indicate below in what extent you think it's applicable with the following items: from 1 (It's not applicable to me at all) to 7 (It's completely applicable to me). (* means the items after EFA were remained for further analysis)

1. I have to sacrifice much to be in work placement.
*2. Work placement is exhausting.
3. Work placement is much work.

*4. Work placement demands much of my time.
5. I can't spend as much time doing the other things that I would like because I am doing work placement.
*6. Work placement requires much effort.
*7. Work placement is stressful.
8. Work placement requires me to give up many other activities I value.
9. Work placement takes much time.
10. Doing work placement causes me to miss out on many other things I care about.
*11. I have to put much energy into work placement.
*12. Work placement is frustrating.
*13. I worry much about work placement.

This part is your perception of engagement for work placement. Please indicate below in what extent you think it's applicable with the following items: from 1 (It's not applicable to me at all) to 7 (It's completely applicable to me).
*1. During work placement, I express my opinions.
2. During work placement, I ask questions.
3. In work placement, I try to make all the different ideas fit together and make sense of these.
*4. In work placement, I participate in all discussions.
*5. I try hard to do well in enterprise.
*6. In work placement, I feel curious about what we are learning.
*7. I pay attention in work placement.
*8. In work placement, I try to relate what I'm learning to what I already know.
*9. I show what I like or what I don't like during work placement.
*10. I offer suggestions about how to make the work placement better.
11. Work placement is fun.
12. I tell my mentor what I am interested in.
*13. When I work on something in work placement, I feel interested.
*14. In work placement, I work as hard as I can.
*15. In work placement, I listen to my mentor very carefully.
*16. I enjoy learning new things in work placement.
*17. In work placement, I try to connect what I am learning with my teaching *experiences.

*18. In work placement, I make up my own examples to help me understand the important concepts I study.

Appendix C: Interview outline (Chapter 4)

Introduction

Thank you for participating in this interview today. I'm Na Zhou, the principal investigator of this study. It's a pity that we have to conduct this interview online instead of face to face because of the COVID-19 situation. I hope you won't feel any uncomfortable. As introduced before in email/WeChat, this study focuses on vocational teachers' learning process with work placement. In this interview, I would like to know your learning experience with work placement which was just completed one week ago. This interview will last around 45 minutes. The information you provide in our interview will be treated confidential and results will be made anonymous when reported. Our talks in this interview will not affect the assessment of your performance in work placement and you are free to withdraw at any time without giving any reason and without any negative consequences. Please feel free to share your opinions and experiences as there are no correct or wrong answers.

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.

Interview Questions

Firstly, I would like to know some background information about you.

1) What subject do you teach?

2) How long have you been teaching?

3) Do you have occupational experience before becoming a teacher?

4) How many times have you attended work placement?

5) How many days do you undertake this work placement?

Secondly, could you please talk a little about your learning experience with work placement which was just ended? For example, what did you do and what was your role? Did you attend particular learning activities? Do you still remember your first impression when you arrived at the workplace?

Thanks for your sharing, based on your experience, now I want to ask you some detailed questions.

Learning activities in work placement

1) Could you choose a typical day and describe what you did on that day?

2) Could you talk about what ways you used to learn in work placement?

3) What ways do you think are important to you and why?

Perceived learning goals and outcomes

1) What did you aim to learn before participation in work placement?

2) What have you learned from work placement?

3) In these what you have learned, which do you think is important to you?

4) How do you think this learning experience will influence your teaching practice?

Concluding remarks

Now, that's all my questions. Before we conclude this interview, is there something about work placement you want to share, which was not mentioned yet?

Thank you very much for your sharing. I will summarise the recording and send the text to you by email to check whether this is complete and correct. This interview will only be used for the research, will not influence your assessment in work placement and won't be shared with others except my research team members.

Appendix D: Interview outline (Chapter 5)

Introduction

Thank you for participating in this interview today. I'm Na Zhou, the principal investigator of this study. It's a pity that we have to conduct this interview online instead of face to face because of the COVID-19 situation. I hope you won't feel too uncomfortable. It has been around half a year since the last interview, in which we talked about your experience with your latest work placement. This time, we would like to know your perceptions of possible changes in your practice during the past semester. The interview will last around 45 minutes. The information you provide in our interview will be treated confidential and results will be made anonymous when reported. Our talks in this interview will not affect the assessment of your performance in work placement and you are free to withdraw at any time without giving any reason and without any negative consequences. Please feel free to share your opinions and experiences as there are no correct or wrong answers.

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.

Interview Questions

(1) Could you reflect on what you did during work placement last time and summarise what you remember of it?

(2) Could you please introduce a little about your teaching subjects in this semester? For example, teaching goals, teaching content, and teaching environment.

(3) Could you talk a little about your students? Such as their grades, learning characteristics, future career.

Changes in behaviors

(1) Do you think your last experience with work placement was useful for your teaching in this semester?

If response: yes

1) Could you elaborate a little why you think it was useful? Also, were there any

changes in your teaching practice due to this work placement? How do you apply what you have learned from work placement to your teaching practice in this semester?

Probes: Probes are from the 'intentions for practice' of the interviews in Chapter 4. For example: You mentioned you would like to do xxx in the last interview, did you do that in this semester?

2) Why do you perform these changes?

3) Apart from your teaching practice, is there any other change?

4) Based on these changes, which changes do you think important?

If response: no

1) Why do you think it not useful?

Factors influencing making changes

From your sharing, it appears that you have changed a lot/little in your teaching practice after work placement. What factors do you think facilitating or hindering your changing or applying?

Suggestion

For the future work placement, what suggestions do you have?

Concluding remarks

Now, that's all my questions. Before we conclude this interview, is there something about work placement you want to share, which was not mentioned yet?

Thank you very much for your sharing. I will summarise the recording and send the text to you by email to check whether this is complete and correct. This interview will only be used for the research, will not influence your assessment in work placement and won't be shared with others except my research team members.

Appendix E: Questionnaire (Chapter 6)

Dear participants,

The aim of work placement is keeping up-to-date with your vocational knowledge and skills. In order to improve the effectiveness of work placement, ICLON Leiden University and CDIBB Tongji University are conducting a research project.

This questionnaire is part of the research project. The questions are focused on your experiences with using what you have learnt in work placement in your school practice. It is expected that the questionnaire will take 10-15 minutes to complete. Your input is very valuable to us as a research team and can contribute to future work placement of vocational teachers.

Your participation in this research is voluntary and you may also withdraw consent at any time. The information provided will be used solely for the purpose of this research project. The results from the questionnaire will be processed anonymously and results will always be made anonymous when reported. The data will be kept securely in Leiden University. If you have any questions or suggestions, feel free to send e-mail to this address: n.zhou@iclon.leidenuniv.nl.

1. Are you female or male? ( )
A. Female B. Male
2. How old are you? _____
3. What is the highest level of formal education you have completed? ( )
A. Diploma of secondary vocational school B. Senior college degree
C. Bachelor D. Master E. Doctorate
4. How many years of teaching experience do you have? _____
5. How many years of occupational experience do you have before becoming a teacher? _____
6. What subject do you teach? _____
7. When was the last time you attended work placement? _____
8. How many days did you attend for the last time? _____

In this section we ask you to indicate what you have learnt in the latest work placement and how you use what you have learnt in your school practice. With regards to what did you learn in your latest work placement? Please provide some

examples in your own words.

_____

_____

_____

Below, for each statement, please select the answer that best fits your experience with using what you have learnt in work placement in your school practice by using the following scale 1 (It's not applicable to me at all) to 5 (It's very applicable to me).

1. I adapted my teaching content based on what I learned in this work placement.
2. I will keep using the adapted teaching content in my teaching.
3. I used some resources (cases, videos, guidebooks, etc.) got from this work placement in my class.
4. I will keep using these resources in my class.
5. I provided career information to students in my classes based on this work placement.
6. I will keep providing career information to students in my classes based on this work placement.
7. I organised activities aimed at developing my students' occupational competences based on this work placement.
8. I will keep organising these activities.
9. I shared my experience of this work placement to support my colleagues in school.
10. I will keep sharing my experience of this work placement with my colleagues.
11. I used my experience with this work placement to contribute to school development, such as developing new curricula and strengthening school-company cooperation.
12. I will keep using my experience of this work placement to contribute to school development.

In this section, we ask you which factors influence you to keep using in your school practice what you have learnt in your latest work placement. Please indicate below to what extent you agree with the following items: 1 (Strongly disagree) to 5 (Strongly agree).

1. My school supervisor meets with me regularly to work on problems I may be having in trying to use in school what I learnt from this work placement.
2. My school supervisor meets with me to discuss ways to apply this work placement

in school.
3. My school supervisor helps me set realistic goals for my performance as a teacher based on this work placement.
4. My colleagues at school appreciate my using what I learned in this work placement.
5. My colleagues at school encourage me to use what I have learned in this work placement.
6. In my school, my colleagues expect me to use what I learned in this work placement.
7. I'm allowed to try out what I learned from this work placement in my school.
8. The resources needed to use what I learned in this work placement are available in my school.
9. I get opportunities to use what I learned in this work placement in my school.
10. The equipment, materials, tools, etc. used in work placement are very similar to those I use in my school.
11. What I have learned in this work placement is very similar to what I teach.
12. I like the way this work placement seems so much related to my school work.
13. I don't have enough time to try to use this work placement in my school.
14. Trying to use this work placement takes much energy away from my other school work.
15. There is too much happening at school for me to try to use this work placement.
16. I never doubt my ability to keep using what I transferred from this work placement in my school.
17. I am sure I can overcome obstacles in my work as a teacher that hinder me to keep what I transferred from this work placement.
18. In my teaching, I feel very confident in keeping what I transferred from this work placement in the face of difficult or taxing situations.
19. I found my job performance as a teacher improved because of my transfer from this work placement to my school.
20. When I transferred from this work placement to my school, my students, colleagues, or supervisors always showed their interest.
21. My transfer from this work placement to my school always produced good results.
22. I feel that I'm closer to being a 'dual-qualified teacher' because of my transfer from this work placement to my school.

Curriculum Vitae

Na Zhou was born on 25th January 1994, in Qingdao (China). After graduating from upper secondary education at Jiaonan No. 1 Middle School in 2012, she studied Management at East China University of Science and Technology (Shanghai, China) and obtained her bachelors' degree in 2016. Subsequently, she completed a Master degree of Management in 2019 at Tongji University (Shanghai, China). In 2019 August, Na started her PhD research at ICLON—Leiden University Graduate School of Teaching, the Netherlands. In her PhD research, Na focused on Chinese vocational teachers' professional learning in the context of work placement. At the same time, she worked as a research assistant in the Institute of Vocational and Technical Education at Tongji University.

During her PhD programme, Na attended courses in her research topic provided by the Dutch Interuniversity Centre for Educational Research (ICO). She published four chapters of the dissertation (Chapter2 to Chapter5). Chapter 6 has also been submitted for publication. She has presented her research during the following conferences: ICO International Spring School 2021, the annual meeting of the American Educational Research Association (AERA) 2022, European Conference on Educational Research (ECER) 2022.

Publications

Scientific Publications

Zhou, N., Tigelaar, D. E., & Admiraal, W. (2022). Vocational teachers' professional learning: A systematic literature review of the past decade. *Teaching and Teacher Education*, *119*, 103856. https://doi.org/10.1016/j.tate.2022.103856

Zhou, N., Tigelaar, D. E., & Admiraal, W. (2022). The relationship between vocational teachers' motivational beliefs and their engagement in work placement. *Journal of Vocational Education & Training*, 1-20. https://doi.org/10.1080/13636820.2022.2066560

Zhou, N., Tigelaar, D. E., & Admiraal, W. (2022). Factors influencing the impact of work placement on vocational teachers' school practice. *Educational Studies*, 1-20. https://doi.org/10.1080/03055698.2022.2069462

Zhou, N., Tigelaar, D. E., & Admiraal, W. (2021). Understanding vocational teachers' professional development in work placement: learning goals, activities, and outcomes. *Studies in Continuing Education*, 1-19. https://doi.org/10.1080/0158037X.2021.1960496

Manuscripts Submitted for Publication

Zhou, N., Tigelaar, D. E., Wang, J., & Admiraal, W. (Submitted for publication) Factors predicting vocational teachers' transfer of learning: A quantitative study in the context of work placement

Presentations

Zhou, N., Tigelaar, D., & Admiraal, W. (2021, March). The relationship between vocational teachers' motivational beliefs and their engagement in work placement. Paper presented at the online ICO International Spring School (ISS), the Netherlands.

Zhou, N., Tigelaar, D., & Admiraal, W. (2022, April). Understanding vocational teachers' professional development in work placement: learning goals, activities, and outcomes. Paper presented at the online annual meeting of the American Educational Research Association (AERA), the USA.

Zhou, N., Tigelaar, D., & Admiraal, W. (2022, September). Factors influencing the impact of work placement on vocational teachers' school practice. Paper presented at the European Conference on Educational Research (ECER), Yerevan.

Acknowledgements

In August 2019, I flew to the Netherlands and started my academic life as a PhD candidate. In this wonderful journey, I experienced many sweet and warm moments, such as papers being accepted, friends party, flying trips. Of course, I also got lots of tough times, in particular, the outbreak of COVID-19 ever made me at a loss of what to do in my life and work. But, no matter those good or blue days, I never felt afraid and stopped my steps because of your support, company, and love. Now, I would like to express my sincere appreciation to you!

I would first thank my promotor Professor Wilfried Admiraal, who is a knowledgeable, insightful, and modest researcher, as well as the best tour guide of my research journey. During the past three and half years, we had communications through more than sixty meetings and countless emails. Every discussion, your insights always enlighten and benefit me a lot. I also learned from you how to face and settle any difficulties in research with a positive attitude. In addition, you are also a person who is passionate for life. I enjoy reading ‘wekelijks berichtje’ written by you (although it’s Dutch, I always translate it into English), in which you often share your dogs, trips, and much other interesting stuff. This also inspires me to think about how to pursue a good balance of my work and life in the future.

I would further thank Dr Dineke Tigelaar, who is not only my supervisor but also my lovely friend. In this research journey, you were always patient and careful with any of my questions, even if some of them might be a little silly. And you provided me with a lot of valuable comments and suggestions, which of course improved the quality of my work. I learn from you about what a responsible and thoughtful supervisor should be like, which will be helpful for me if I have an opportunity to supervise others in my future career. You also enriched my life in the Netherlands, such as you gave me a sightseeing tour of your living town. The pictures we dressed in Cheese lady clothes together was one of my favourite pictures in the Netherlands.

Thanks to all ICLON colleagues. I cherish the memory of every happy hour, every research group meeting, and every small talk in the office or in the hallway. You

provide me with not only academic but also cultural and emotional support. I would like to particularly thank my Chinese colleagues Linyuan Wang, Xu Liu, Xiaohua Jia, and Xin Zhang. It is all of you that make my life in the Netherlands rich and colourful. Outside the ICLON, I would like to thank my colleagues at the Institute of Vocational and Technical Education, Tongji University. In particular, I owe my thanks to my master's supervisor Professor Jiping Wang. You gave me so much support and guidance during my PhD studies. And thanks my pal Hui Tang. It is my luck to have you to share our research and daily life all the time.

To my family, you are who I care about the most. My dear mother, father, and sister, you give me all of your love on my way of growing up. You always encourage me to try anything I want and respect every decision that I made. My dear boyfriend Xinglin Jin, a kind, gentle, and warm man, I am so lucky to hold your hand on this journey. As you said, we know each other more than anyone else and confront the difficulties together during our PhD processes.

Besides, I would like to thank myself, a girl who always held her destiny in her own hands. I know all of what you experienced on this journey and I'm glad to see that you make great progress. Although the future is not predictable, please do know, I will be with you all the time.

In the end, I send my blessing to all I mentioned above with the words from the movie 'Soul', it is 'I am going to live every minute of it'.

Na Zhou
Shanghai

Leiden University Graduate School of Teaching

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