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

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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.

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 and Köpsén 2018; Dymock and Tyler 2018). To maintain in-service vocational teachers' work-life competence and its integration in 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 and Payne 2012; Zaid and 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 and Köpsén 2015; Fejes and 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

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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 and Köpsén 2015; Köpsén and 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). 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.

The descriptions of work placement in Chinese vocational education

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 A. R. C 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, and Lawson 2009). Therefore, the curriculums 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 the 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 and Köpsén 2018), to improve vocational teachers' occupational expertise, work placement has been implemented nationwide in line with the regulations of the Chinese government.

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.

The impact of learning experience on teachers' school practice

Teaching practice is an influential factor for student achievements (Chaaban 2017; Kilinc, Bellibas, and 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.

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.

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 programmes in their classrooms, such as time restraints, 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, and 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 1, the factors affecting individuals' transfer of learning have commonly been classified into three domains, including the 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
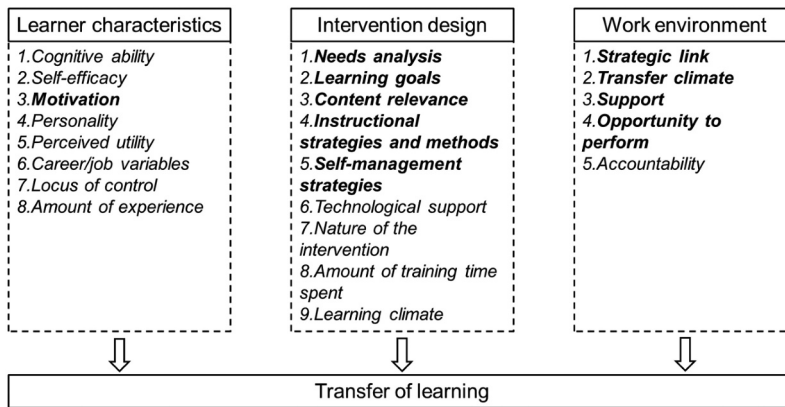
Figure 1. The adapted conceptual framework of the variables influencing transfer of learning in staff development interventions. *note: bold indicates the factors influencing teachers' transfer of learning in higher education* (Based on De Rijdt et al. 2013).

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.

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:

Q1. What are vocational teachers' intended and actual changes in their school practice based on work placement?

Q2. What factors do vocational teachers perceive as facilitating or hindering for implementing their changes in school practice?

Method

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 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 trainings 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.

Data collection

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.

Table 1. Participants' information.

Number	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	Decoration of 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

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. 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. 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?").

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 the 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 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.

With regards 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 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

Table 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
	Organising competence-based activities or settings	Designing some activities or settings to develop vocational students' occupational competence

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.

Results

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 3). Overall, the participants reported impact at the level of individual classroom practice more frequently than at the other two levels (Table 4).

Table 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 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 settings	9	9

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 curriculums. 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.

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".

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 producing 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 interests for future career 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.

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.

Teacher characteristics

Teacher characteristics refer to teachers' experience, personality, 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 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)

Work placement

Three factors were identified as work placement factors in our study, of which clear learning goals was regarded as a facilitating factor, whereas short duration of 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 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)

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)

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)

Discussion

This study is focused on exploring the perceived impact of work placement on vocational teachers' practice in school and 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.

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 actions 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 and 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.
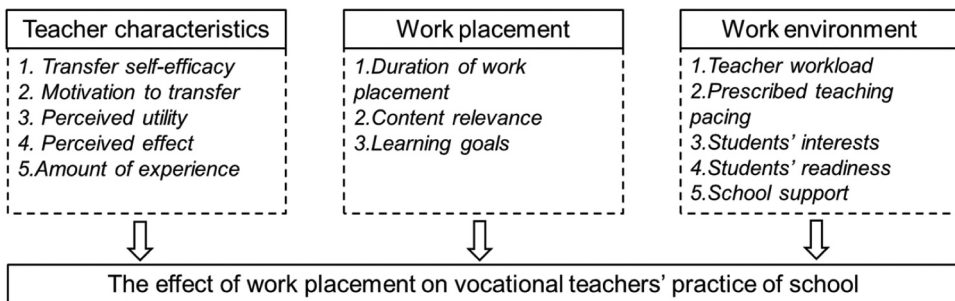
Factors influencing the impact of work placement on teachers' practice

The findings from this study also revealed facilitating or hindering factors with regards to vocational teachers' implementation of their changes in practice after work placement (as shown in Figure 2). These factors were clustered into three domains, i.e. teacher characteristics, involving teachers' beliefs, personality, and experience; 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 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 attributes of these factors with respect to facilitating or hindering, which is helpful to observe the influence of these factors.

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, and Kracke 2017). In addition, teachers' levels of experience are involved in the existing conceptual model on transfer of learning, but has 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 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, and Van

Teacher characteristics	Work placement	Work environment
1. Transfer self-efficacy 2. Motivation to transfer 3. Perceived utility 4. Perceived effect 5. Amount of experience	1. Duration of work placement 2. Content relevance 3. Learning goals	1. Teacher workload 2. Prescribed teaching pacing 3. Students' interests 4. Students' readiness 5. School support

⇩ ⇩ ⇩

The effect of work placement on vocational teachers' practice of school

Figure 2. Factors influencing the effect of work placement on vocational teachers' changes in their school practice.

Veen 2020; Smith and 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 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 school, 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 students' factors have been seldom explored in the 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 in our study, i.e. content relevance, school support, teacher workload, students' interests, and perceived utility. These factors exactly explain 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.

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 effect of the factors found in this study.

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 regards to teachers' changes within the school domain 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.

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Disclosure statement

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