Teachers' teaching and learning motivation in China

Zhang, X.

TEACHERS' TEACHING AND LEARNING MOTIVATION IN CHINA

XIN ZHANG

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ICLON, Leiden University Graduate School of Teaching

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Dr. L.C.A. Claessens, Utrecht University
Dr. E.H. Tigelaar

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GENERAL INTRODUCTION

1.1 Introduction

Teaching is considered to be one of the most important predictors of students' learning outcomes (Dello-Iacovo, 2009; Wei, Darling-Hammond, Andree, Richardson, & Orphanos, 2009). As a consequence, professional learning programmes are designed to support teachers to use various instructional practices effectively in the classroom. Teachers' professional learning has received considerable attention in research and practice as a way to maintain high teaching standards.

Several studies have reported the positive relationship between teachers' participation in professional learning programmes and their teaching quality (e.g., Cheng & So, 2012; Wei et al., 2009). However, teachers' continuous learning is not self-evident. Learning motivation is one of the most important psychological factors that determines learning behaviour of teachers (Roth, Assor, Kanat-Maymon, & Kaplan, 2007). Many studies have indicated teachers' autonomous motivation to learn is a basic condition for teacher successful professional development (Shulman & Shulman, 2009). However, in practical terms, teachers differ in their learning motivation. Some teachers may implement professional learning activities with considerable energy and persistence, whereas others are reluctant to participate.

Previous studies have reported that the effectiveness of professional development (PD) may affect teachers' willingness to learn (Gan, Nang, & Mu, 2018; Kwakman, 2003; W. Liu, Yuan, & Zhang, 2018). In China, educational researchers have acknowledged that the traditional teachers' professional development programmes provided by the government do not fit teachers' own learning preferences or their specific concerns, and fail to stimulate teachers' motivation to participate in PD (Yan, 2015; Yuhua & Jiacheng, 2013; X. Zhang & Wong, 2018). To better stimulate teachers' learning motivation, more and more new teachers' professional development programmes provided by universities are organised to help school teachers to improve their teaching quality. In this research project, we focus on a specific educational programme, the New Basic Education (NBE), which is designed as a PD programme in China with the aim to improve teaching quality. We intend to explore the effects of NBE on teaching quality. In addition, we intend to explore the relationship between teachers' learning motivation and their teaching quality. Finally, to stimulate teachers' learning motivation, we also want to investigate the factors which contribute to teachers' learning motivation in the NBE. The remainder of the introduction

first describes the context of the study, followed by the theoretical foundation, and finally, an overview of the following Chapters is presented.

1.2 Context of this research project: New Basic Education

In China, educational assessment is dominated by high-stakes examinations. In light of the importance of examination success, initial teacher education encourages teachers to develop their teaching practices emphasized on knowledge delivery, memory-driven learning, and teacher-centred approaches (Xin & Fred, 2014) to ensure high student academic achievement in public examinations. This contradiction between the quality-oriented ideal and the test-oriented reality has aroused concern among Chinese scholars. In order to change this situation, various PD programmes are designed to improve teachers' teaching quality. A notable example in China is the New Basic Education. which is designed as a long-time period of a school-based training programme to continuously help teachers to learn and refine their pedagogy. Academic supervisors from three types of universities (Normal universities under the Ministry of Education of the People's Republic of China; Comprehensive research universities; Provincial normal universities) go to schools weekly to organise seminars for all teachers to disseminate their own professional experiences and beliefs. They also visit classes each week to observe teaching and provide feedback. In addition, they organise monthly workshops to encourage teachers to use more student-centred teaching approaches to foster student motivation and improve their self-directed learning. In Table 1.1, we provide a summary of the general setup of the NBE programme. Nowadays, NBE programme is being carried out in 100 primary and secondary schools in Shanghai, Zhejiang, Shandong and Jiangsu Province. About 20,000 teachers are involved, with implications for 100,000 primary and secondary school students (Yuhua & Jiacheng, 2013).

Although NBE is regarded as effective, not all the teachers are willing to participate in NBE (Yuhua & Jiacheng, 2013). Many factors, such as teacher personal factors (e.g., Ryan & Weinstein, 2009) and school working conditions (e.g., Pelletier, Séguin-Lévesque, & Legault, 2002) may affect teachers' learning motivation. Consequently, it will eventually affect teachers' implementation of educational measures into their current approaches (Epstein, 1998). In light of this context, this research project focuses on teachers' learning motivation in the NBE and the effects of fol-

lowing NBE on teaching quality. We want to know how teachers develop their teaching when they participate in NBE, and the relationship between their teaching quality and learning motivation in NBE. Finally, this research project intends to explore the factors which are important for teachers' learning motivation.

Table 1.1
learning activities organized by NBE

Activities	Content	Length	Frequency
Lectures	General knowledge of curriculum and pedagogy	1-3 hours	Weekly
Workshops	Specific skills including: 1: Curriculum and materials design, 2: Teaching and management skills 3: Stimulating students' interest	1-3 hours	Weekly
Classroom observations	Observation and evaluation of teaching, and providing professional recommendations	3-6 hours	Monthly
Reflective activities	Teachers are required to reflect on past learning, consider implications, and let reflection guide future actions and activities	1-3 hours	Weekly

1.3 Conceptual framework

Teachers' learning motivation is a significant factor in explaining the effectiveness of continuous professional development programmes, and many factors may have the potential to influence teachers' motivation to learn. In this Chapter, we first describe the theory of teacher learning motivation, and then discusses the factors which are important for teachers' motivation. Finally, to relate teacher learning motivation and their learning performance, the measurement of teachers' learning performance is presented.

1.3.1 Teachers' learning motivation

Teachers' learning motivation is a basic condition for teacher learning and successful professional development (Shulman & Shulman, 2009). In this research project, self-determination theory (SDT) is used to define teachers' learning motivation. SDT approaches learning motivation as a multidimensional construct, implying that individuals may have multiple reasons for engaging in a certain behaviour (Deci & Ryan, 2002). In the case of participating in learning activities, a teacher may work with teaching experts to improve his or her instructional quality owing to the pleasure and enjoyment derived from the partnership. This represents an example of intrinsic motivation, which is deemed to be the most self-determined type of motivation. In contrast, extrinsic motivation refers to behaviours that are exhibited in order to attain material incentives, recognition or rewards, or to avoid punishment. It can be divided into: a) external regulation, when the reasons for participating in professional learning are entirely external from the self; b) introjected regulation, when the reasons for getting involved in professional learning are not fully internalised and teachers merely want to avoid feelings of guilt or shame; and c) identified regulation, when the reason for doing an activity is to pursue fully internalised goals, which is considered a highly self-determined form of extrinsic motivation (Georgios Gorozidis & Papaioannou, 2014). According to Deci and Ryan (2000) self-determination theory, intrinsic motivation and identified regulation can be understood as autonomous motivation, while external regulation and introjected regulation is conceptualised as controlled motivation. Research on teachers' learning motivation has systematically revealed that autonomous motivation is strongly related to positive teacher learning outcomes, whereas controlled motivation has been closely associated with negative outcomes (Blais, Lachance, Vallerand, Briere, & Riddle, 1993; Deci et al., 2001; Gagné et al., 2010). For example, Wang and Liu (2008) indicate that teachers with higher levels of autonomous motivation to learn demonstrated more confidence in learning and teaching, and the more they were engaged in reflecting on professional learning. This is congruent with the findings of a study by Gorozidis (2009) that indicate that the higher the level of teachers' intrinsic motivation to learn, the greater the degree of implementation of the professional learning programme.

1.3.2 Factors related to teachers' motivation to participate in professional learning activities

Many studies have indicated that teachers' personal factors, their perceptions of workplace conditions in schools, and principal leadership potentially affect their motivation to participate in professional learning activities (Geijsel, Sleegers, Stoel, & Krüger, 2009; Thoonen, Sleegers, Oort, Peetsma, & Geijsel, 2011). For teachers' personal factors, several studies show that perceived self-efficacy is important for teachers' learning motivation. (Mintzes, Marcum, Messerschmidt-Yates, & Mark, 2013; Tang, Cheng, & Cheng, 2014). Teachers with more self-efficacy are more likely to participate in PD programmes to take risks and to experiment in their teaching while following a PD programme. Tschannen-Moran and Hoy (2001) also find that the more self-efficacy teachers had in their teaching, the more willing they were to participate in PD to demonstrate acceptance of new ideas and experiment with new instructional methods. Other studies, however, came to a somewhat different conclusion, indicating that teachers with more confidence in, and satisfaction with, their teaching showed less willingness to participate in PD to alter their way of teaching (Supovitz, Sirinides, & May, 2010; Zhao, Valcke, Desoete, Sang, & Zhu, 2014). In addition, teachers' beliefs about learning also seem important for teachers' learning motivation. Bolhuis and Voeten (2004) find that teachers with stronger beliefs in intelligence as a malleable quality were more concerned with developing their teaching competence, and less like to give up when confronted with difficulties in PD programs Moreover, some researchers also find that teaching experience affects their learning motivation. For instance, Maskit (2011) indicates that teachers displayed significant differences in attitudes towards to participate in PD at different stages of their careers, with teachers at the stages of induction and competency building being more likely to participate in PD than those in more stable stages.

Apart from personal circumstances, working conditions, such as work and emotional pressure, task autonomy, and help from colleagues may also affect teachers' learning motivation in PD programmes. In a survey of 502 teachers from 32 elementary schools in the Netherlands, Thoonen, Sleegers, Oort, Peetsma, and Geijsel (2011) find that task autonomy, which refers to the joint decision-making of principals and teachers, may reinforce the extent to which school values are internalised as teachers' personal goals and subsequently affect their learning motivation. In addition,

according to Rosenholtz (1989), the more emotional pressure teachers perceived in school, the more reluctant they were to attend perform activities.

In addition to these environmental circumstances, leadership from the school principal may also significantly influence the degree to which teachers become involved in PD programmes (Fullan & Hargreaves, 1996). Eyal and Roth (2011) show that transformational leadership stimulates a teacher's participation in professional learning activities, and that was even a strong predictor of professional learning activities than other personal and environmental factors. Many studies also indicate that Chinese school principals are expected to play a significant role in teachers' development. For example, in an exploratory study of principal leadership in mainland China, Pisapia and Ying (2011) report that in Chinese principals have great power to model teaching behaviour and their skills in curriculum and pedagogy; only a few school teachers would go against the principals' decisions. Based on previous studies, we have developed a framework of factors which is important for teachers' learning motivation (see Figure 1.1).

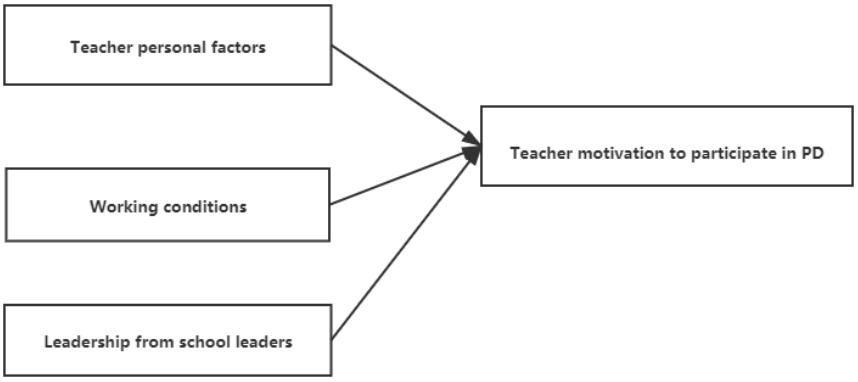

Figure 1.1
The framework of teacher motivation to participate in PD.

1.3.3 Measurement of learning performance

This research project intends to explore the relationship between teachers' learning motivation and their learning performance in the NBE. The purpose of NBE is to encourage teachers to improve their teaching quality through developing a new pedagogy that fosters students' active learning and critical thinking abilities. Therefore,

teachers' learning performance in this research project is defined in terms of teaching quality.

Extensive literature has indicated that three basic dimensions − classroom climate support; classroom management; and cognitive activation reflect the key aspects of teaching quality (Kunter & Baumert, 2006; Wagner, Göllner, Helmke, Trautwein, & Lüdtke, 2013). Classroom climate support includes specific aspects of the teacher-student positive relationship and constructive teacher's feedback. In order to enhance a positive climate, teachers should provide extra help when needed, respect students' questions and care about students, which is crucial for students' intrinsic motivation and subject-related interest. Classroom management refers to classroom rules and procedures, coping with disruptions, and smooth transitions, which is crucial for students' learning gains. Cognitive activation encourages students' cognitive engagement by integrating changing tasks, exploring theoretical conceptions, and applying knowledge. Previous studies have shown that cognitive activation indeed fosters students' cognitive engagement, and students' ability to elaborate knowledge (Kunter, Baumert, & Köller, 2007). In addition, many studies indicate that these three dimensions, classroom climate support; classroom management; and cognitive activation are found to be positively related to students' learning outcomes, such as students' development of subject-specific interest, and student academic achievement (Fauth, Decristan, Rieser, Klieme, & Büttner, 2014).

A considerable debate with regard to evaluating the quality of instructional behaviour deals with selecting methods that are powerful enough to reflect 'real' teaching practice. Two common methods for measuring the quality of teaching practice are 1) registration methods (i.e., classroom observation) and 2) methods based on perceptions, mostly student surveys (Hassan & Wium, 2014). When a teacher teaches in the classroom and is involved with classroom management and the content of the lesson, registration methods can allow an observer to record what is happening in the classroom. The record from the observer is often considered as the most objective by many researchers (Dobbelaer, 2019b). Compared to registration methods, students perceptions of teaching quality can also function as a valuable source of feedback to teachers as students are the learners and spend the most time in the classroom (Dockterman, 2017a). In addition, the two methods differ in *who* evaluate the quality of teaching. Classroom observations are often carried out by external experts or col-

leagues who provide comments. They have the ability to recognise and understand complex instructional behaviours. For student evaluation, perceptions from students are based on day-to-day experiences with the teacher during different lessons, not merely from a single or limited number of observations. It can be concluded that both methods have their benefits. To have a better understanding of teachers' learning performance, this research project uses both classroom observations and student questionnaires as instruments to evaluate teaching quality.

1.4 Overview of the research project

The research project focuses on teachers' learning motivation and learning performance in the NBE. Teachers' learning during the NBE is defined in terms of teaching quality. Three assumptions as follows: (1) the quality of teaching has been significantly improved after a period of study in NBE, (2) teachers' teaching quality and their learning motivation are interrelated, (3) teacher personal characteristics and school working conditions are important for their learning motivation. To explore these topics, students and supervisors from NBE are invited to evaluate teaching quality, teachers who differed in the experience with the NBE from primary education participated in this project to explore their perceptions of learning motivation. Various analysis methods are performed based on the same data set in the following Chapters:

In *Chapter 2*, we address the evaluation of teaching quality. The study examines the students' and supervisors' perceptions of teaching quality. Specifically, this study sought to answer the questions: *(1) What is the relationship between supervisor and student perceptions of instructional quality? (2) What are the evaluation criteria used by supervisors and students?* To answer these questions, a total of 20 teachers from 12 primary schools participated in this project. 497 students of the 20 teachers are invited to evaluate their teachers' teaching by the student questionnaire. In addition, for these teachers, three lessons within three weeks are videotaped and assigned to 10 supervisors to evaluate their teaching. Mixed methods are performed to analyze the data.

In *Chapter 3*, we cover the effect of NBE on teaching quality. We want to know how teachers develop their teaching after six months of learning in the NBE. The

following research questions are addressed: *(1) Do teachers improve their teaching quality as evaluated by their students during participation in the NBE program? (2) How are teacher characteristics, school working conditions and principal's transformational leadership related to the changes in teaching quality?* To answer these questions, 375 teachers from 12 primary schools in Shanghai who are active in the PD program participated in this study. A paired-samples t-test is carried out for two teaching quality scales together at two different times to test whether the change was significant. Then stepwise regression analyses are performed to assess the relationship between teacher personal factors, working conditions, and principal transformational leadership, on the one hand, and changes in teaching quality, on the other hand.

Teachers' learning motivation is an important predictor for teacher learning performance. In *Chapter 4*, we relate teachers' learning motivation to their teaching quality. Specifically, we explore the relationship between teachers' learning motivation, as well as other personal and environmental factors and their teaching quality. The following research questions are formulated to guide this study: *How are working conditions, school leadership, and teacher psychological factors related to students' perceptions of teaching?* To answer these questions, 472 teaches participate. In this study. Multivariance analyses of variance are performed with teacher personal factors, working conditions, as well as principal leadership as independent variables and teacher learning motivation as dependent variables.

The third assumption of this research project is that teacher personal characteristics and school working conditions are important for their learning motivation. Therefore, in *Chapter 5*, we explore how teachers' characteristics and school working conditions are both related to their learning motivation, the following questions: *How are factors at the personal and school levels related to teachers' motivation to participate in professional learning?* To answer these questions, 472 teaches participate in this study. Multivariance analyses of variance are performed with teacher characteristics and environmental factors as independent variables and the three motivation scales as dependent variables.

Teachers' autonomous motivation is positively related to teacher learning outcomes. In *Chapter 6*, we explore how teacher psychological factors moderate teachers' autonomous motivation. The following research questions are addressed: *(1) Which*

workplace conditions are related to teachers' autonomous motivation to learn? (2) Which workplace conditions moderate the relationship between teachers' characteristics and their autonomous motivation to learn? To answer this question, 472 teachers from 12 primary schools in Shanghai participate in this study. Multilevel regression analyses are performed with factors at level 1 and 2 as predictors of teachers' autonomous motivation with Mplus 8.

Finally, in *Chapter 7*, we provide an overview of the main findings from chapter 2 to 6, followed by a discussion of these findings, implications, and theoretical and educational practice.

2

WHAT IS GOOD TEACHING: A COMPARISON OF THE PERCEPTIONS ON TEACHING QUALITY OF EXTERNAL SUPERVISORS AND STUDENTS

Abstract

New Basic Education (NBE) has been launched by university supervisors to encourage school teachers to improve their teaching. In NBE, assessment by university supervisors, who visit schools for their evaluation and feedback, is a crucial element. Besides supervisors' comments, as the consumer of NBE, students' voices should not be ignored. However, little is known about how university supervisors' assessments align with evaluations from primary school students. This study aims to fill this gap by exploring supervisors' and students' evaluations of 20 primary school teachers who participated in the USP. Their teaching practices were evaluated by 10 academic supervisors from NBE and 497 students from primary schools to explore the relationship between students' and supervisors' evaluations of teaching. In general, the results reported fairly low correlations between students' and supervisors' evaluations of teaching. It seems that students and supervisors applied different criteria and focused on different aspects of teaching. Students seemed to be more focused on learning climate, activating teaching, and instructional adaptation, whereas supervisors seemed to pay more attention to classroom management, instructional clarity, and strategies of instruction. Given both observations and student surveys have strengths and weaknesses, both methods should be seen as complementary ways to evaluate teaching.

This Chapter has been submitted for publication in an adapted form as Xin, Z., Saab, N., & Admiraal, W (under review). Students and supervisors' perceptions of teaching in primary education.

2.1 Introduction

In China, many large-scale education reforms have been launched as a result of the strong demand for teachers to learn how to improve their teaching to meet the challenges of a fast-changing society. One of these reforms is the New Basic Education (NBE), which can be understood as a form of university-school partnership – supervisors from universities visit teachers at schools to help them to reduce teacher-centred teaching in favour of student-centred approaches, and support them in becoming more inquiry-oriented and to engage students in solving practical problems, developing the ability of critical thinking (Li, 2020; Ye & Cheng, 2018). In teachers' continuous development, the partnership between school and university is a way to close the gap between theory and practice, and supervisors' assessment of teaching practices is a crucial element of the programme (Vrijnsen-de Corte, den Brok, Kamp, & Bergen, 2013).

Besides supervisors' measurement, as part of this collaboration, students' assessment of teaching quality should also be considered an important source of the programme, since that the ultimate goal of NBE reform is student achievement, and students are the consumers of their teachers' classroom teaching, their voices should be heard (Dockterman, 2017b).

Previous research reports that external observers and school students have access to different features of learning environments (Seidel & Shavelson, 2007). This indicates that the two sources of evaluation are important sources for studying learning environments. Some of these studies used quantitative data to explore the relationship between observer ratings based on classroom observation and student ratings measured in a survey (e.g., Dobbelaer, 2019a; Maulana & Helms-Lorenz, 2016). Such quantitative measures may help us to recognise the relationship between classroom observation and student survey, and the differences in specific aspects of instructional quality. However, it fails to tell us *why* students and observers have different perspectives on these specific aspects, and what are their respective evaluation criteria. In addition, most studies focus on students from high education, the research in primary education is quite limited. The present study focuses on comparing university supervisors and primary school students' evaluations of teaching, and uses mixed methods to not only explore the relationship between students' and external supervisors' perceptions of instructional quality, but also to interpret differences.

2.2 New Basic Education

In China, educational assessment is dominated by high-stakes examinations. In light of the importance of examination success, teachers training programmes organized by the government are designed to emphasize knowledge delivery, memory-driven learning, and teacher-centred approaches (Xin & Fred, 2014), which is always criticized for limiting students' deep learning and creativity (Yu, Chen, Levesque-Bristol, & Vansteenkiste, 2016). To counteract the test-oriented education, New Basic Education is designed by researchers from East China Normal Universities (ECNU). ECNU collaborative with partner schools to equip school teachers with new pedagogical knowledge to reduce teacher-centred teaching in favour of student-centred approaches under the facilitation of university supervisors. To ensure the successful implementation of new teaching strategies, supervisors from ECNU go to their partner schools regularly to discuss with teachers, deliver lectures, observer lessons, as well as provide professional recommendations (*see Introduction Table 1.1*). After years of development, more and more schools tend to seek professional support from university supervisors who are perceived as knowledge providers. NBE has become an increasingly influential project with the expansion of teachers' knowledge base (Bu & Han, 2019).

2.3 The role of supervisors in New Basic Education

Supervisors from the NBE have three different backgrounds: 1) theoretical researchers from ECNU, 2) teacher educators from local colleagues, and 3) part-time researchers from other universities (Li, 2020). They formed consulting teams to go to their partner schools regularly to assist teachers in schools to implement new teaching strategies by coaching and mentoring teaching practices. After classroom observation, a meeting will be organized and supervisors will give their comments on teaching based on the observation form, and teachers reconstruct their knowledge by being supported by trained supervisors.

Although many researchers have explored school administrator and principal evaluations of teaching (Supovitz et al., 2010; Yan, 2015), little is known about the evaluations of supervisors from universities. Moreover, unlike school administrators and principals, most supervisors are professors, researchers, or teacher educators

employed at universities, which might mean that they are more informed by international literature on teaching and learning that stresses the importance of student-centred teaching. However, the priority of administrators and principals is to ensure high student academic achievement in public examinations. The different interests may also lead to different criteria used in the evaluation of teaching. To fully understand the possible benefits of NBE and the role of supervisors in it, more insights are needed about the criteria supervisors use to evaluate teaching.

2.4 Evaluation of teaching quality in primary education

In the 1995 TIMSS video study, Klieme, Pauli, and Reusser (2009) develop a theoretical framework to elaborate teaching quality. Based on the framework, Fauth et al. (2014) present a model which can successfully be applied to evaluate teaching in primary schools. It consisted of three dimensions of teaching quality: 1) classroom management, 2) cognitive activation, and 3) supportive climate.

Classroom management is a well-known concept in educational research, it is operationalised how teachers deal with disciplinary problems and disruptions in the classroom. This classroom practice can be treated as preconditions for time on a task that is, in turn, significant for student achievement. Cognitive activation was related to the exploration of concepts, ideas, and prior knowledge. These classroom practices would develop students' cognitive engagement, in turn, lead to elaborated knowledge. Supportive climate refers to specific aspects of a positive teacher−student relationship and constructive teachers' feedback. It comprises teachers' warmth, encouragement, and constructive feedback. Classroom with a supportive climate that can fulfil students' needs and have positive effects on student outcomes. To enhance a positive climate, teachers should provide extra help when needed, respect students' questions and care about the students.

A growing global literature reported that claimed that these three dimensions reflect the key aspects of teaching, and can be replicated in ratings of students from primary schools, and are positively related to student academic achievement and subject-specific interest (Fauth et al., 2014).

2.5 Classroom observation and student survey to evaluate teaching

A considerable debate with regard to evaluating the teaching behaviour deals with selecting methods that are powerful enough to reflect 'real' teaching practice. Two common methods for measuring the teaching practice are registration methods (i.e., classroom observation) and methods based on perceptions, mostly student surveys (Hassan & Wium, 2014). Each method has its own strengths and weakness, below we will first discuss each method, and then go into the relationship itself between these two methods.

2.5.1 Classroom observation

The record from the observer is often considered as the most objective by many researchers (Dobbelaer, 2019b; Maulana & Helms-Lorenz, 2016). Observers can provide valuable information to teachers. However, it is not self-explanatory that classroom observation can always provide a valid evaluation. Several issues, such as the quality of external observers and the number of lessons per teachers that should be observed, need to be taken into account when using classroom observation. It can make classroom observation a costly and time-consuming method. In addition, the presence of observers can influence teachers' behaviour as well (Maulana & Helms-Lorenz, 2016).

2.5.2 Student survey

Compared to classroom observation, methods based on self-reports mostly use student perceptions to evaluate teaching can also function as a valuable source of feedback to teachers as they are the learners and spend the most time in the classroom (Dockterman, 2017a). In addition, perceptions from students are based on day-to-day experiences with the teacher during different lessons, not merely from a single or limited number of observations. The weakness of student survey is that several studies report that the evaluation has the potential to be influenced by teachers' personal factors which are unrelated to teaching quality, such as teacher popularity and teacher gender (Hassan & Wium, 2014; Wagner et al., 2013). However, there are many studies that confirmed the reliability and validity of student ratings (Aditomo & Koehler, 2020; Fauth et al., 2014).

2.5.3 The relationship between classroom observation and student survey

Studies that include both classroom observations and student surveys have shown low to moderate agreement between students' and external observers' evaluations of teaching (Dobbelaer, 2019b; Maulana & Helms-Lorenz, 2016). For example, in their study of ninth grade science classrooms, Lawrenz, Huffman, and Robey (2003) used a regression model to explore the relationship between supervisor and student evaluations of science classroom practice. The results indicated low correlations between observer observations and student evaluations. These low correlations are also supported by Maulana and Helms-Lorenz (2016). In that study, quantitative data was collected from 2,164 students of 108 teachers in the Netherlands. The results indicated a low agreement between trained supervisors and students in three aspects of teaching behaviour: learning climate, classroom management, and clarity of teaching. Some issues may have contributed to the low correlations that were found in the previous studies, such as different construction of measurements, different standards of external observers and students, or the fact that student questionnaire and classroom observation were not conducted at the same moment in time(Maulana & Helms-Lorenz, 2016).

2.6 This study

This study not only explores the relationship between students' and supervisors' evaluations of teaching, but also interprets the construct representation and potential differences measured by students and supervisors. We expect low correlations between perceptions from supervisor observations and student questionnaires because we anticipate that classroom observations by observers and student surveys of instructional behaviour are not simply different methodological approaches; rather, the two methods might be tapping into different representations of the meaning of 'real' instructional behaviour. Based on these considerations, the following research questions are addressed:

1. What is the relationship between supervisors' and students' evaluations of instructional quality?

2. What are the evaluation criteria used by supervisors and students?

2.7 Method

2.7.1 Participants

In this study, 12 primary schools that participated in NBE participated in this study. Many studies have indicated that the sense of self-efficacy is a significant predictor of teaching in the classroom (Gaertner & Brunner, 2018; Tschannen-Moran & Hoy, 2001). Accordingly, a total of 472 teachers completed a questionnaire on feelings of self-efficacy. They were numbered and divided into three groups based on their mean scores in self-efficacy: top 30% of teachers in the high-level group, then 40% of teachers in the medium-level group, and last 30% of teachers in the low-level group. Then we randomly selected 6 teachers from high-level-group, 8 teachers from medium-level-group, and 6 teachers from low-level-group to participate in the current study, with a total of 20 teachers. In addition, we invited 497 students of the 20 teachers to evaluate their teaching. These teachers were on average 34 years old (*SD*= 7.24) and taught different subjects. Sample statistics regarding age, gender, teaching experience, and other information are presented in Table 2.2. These students were on average 10.55 years old (*SD* =1.19). Class sizes range from 15 to 35 students per class, with a mean of 25 students (SD = 5 students).

Participation in the study was strictly voluntary and confidential for teachers, supervisors, and students. Upon recruitment, principals authorized the study within their schools, and teachers, supervisors, students, and their parents were asked to sign an informed consent regarding their collaboration in the study. Ethics approval for this study was granted by the institution the authors are from. Teachers completed a questionnaire in their offices. Students were given enough time to respond in classrooms. Supervisors were asked to finish their observation form in their offices after watching the video-tapes of the three lessons.

Table 2.2

Sample statistics

Teacher's number	Age	Gender	Subject	Teaching experience in years
366	30	Female	Math	7
23	30	Female	Math	3
428	30	Female	Math	6
65	37	Female	Math	14
16	35	Male	Math	12
63	44	Female	Math	21
96	46	Female	Math	4
208	30	Female	Math	5
353	45	Female	Chinese	22
114	49	Female	Chinese	26
283	30	Female	Chinese	7
226	30	Female	Chinese	7
42	29	Male	Chinese	7
228	23	Female	Chinese	1
315	30	Female	Chinese	6
46	42	Female	English	19
431	35	Female	English	12
108	36	Female	English	13
333	40	Female	Art	17
217	27	Female	Music	4

2.7.2 Procedure

Many studies have indicated that to get reliability information, there should be a limit of a total of three observations, and the interval between observations should be short to ensure stability in teaching quality (Hill et al., 2012; Maulana & Helms-Lorenz, 2016). Therefore, for each teacher, three lessons within three weeks were videotaped.

Based on teacher participation, we selected 10 supervisors to participate in this study. All supervisors had a Bachelor's or Master's degree in Education, rich teaching experience in primary education, and expertise in different subjects. Supervisors and teachers did not know each other. Teachers are assigned to different supervisors depend on the subjects they teach (see Table 2.3). The 10 supervisors rated 20 teachers' videos and provided comments according to the observation form. Then we invited students of the 20 teachers to evaluate their teaching. After three lessons, stu-

dents were asked to complete the questionnaire to indicate their evaluation of three lessons.

Table 2.3

The assignment of teachers to supervisors

Supervisor's number	Subject	Teacher's number
Supervisor 1	Math	366, 23,
Supervisor 2	Math	428, 65
Supervisor 3	Math	16, 63
Supervisor 4	Math	96, 208
Supervisor 5	Chinese	353, 114
Supervisor 6	Chinese	283, 226
Supervisor 7	Chinese	42, 228, 315
Supervisor 8	English	46, 431
Supervisor 9	English	108
Supervisor 10	Art and Music	333, 217

2.7.3 Measures

2.7.3.1 Student questionnaire

According to the framework created by Fauth et al. (2014), a paper-and-pencil student questionnaire was developed. It consisted of 21 items. All the items were adapted and reworked for application in primary school classrooms. We avoided negative formulations, inverted items, and complex expressions. Each item was scored on a 4-point Likert-type scale (1= strongly disagree; 4= strongly agree). The 21 items were subject to an exploratory principal component factor analysis with direct oblimin to determine underlying factors. The final analysis consisted of two components of 19 items, which explained 41.9% and 11.5% of the variance in scores, respectively. Two items were deleted because of low factor loadings and no cross-loadings (>.40) were found. The first component included cognitive activation and supportive climate, which was labelled to "classroom teaching", indicating exploration of students' prior knowledge and building a supportive learning climate. The second component was labelled "classroom management" with items on classroom rules and procedures dealing with disruptions. The Cronbach's alphas of classroom teaching and classroom management were 0.91 and 0.89, respectively. All the items of the

student questionnaire are shown in Appendix 1.

2.7.3.2 Classroom observation

To better capture how supervisors evaluate teaching quality, we decided to use the data from observation form that is used in the programme. The supervisors have been trained for many years to use this observation form to evaluate teaching quality. We assumed that using this form could help supervisors to provide us more insights into the evaluation of teaching quality. In addition, this observation form is currently used in more than 200 schools. Using this form will help us to better understand what is happening in the classroom, and how supervisors modelling school teaching in practices.

Similar to the student questionnaire, the data from observation forms is also divided into two main categories: classroom management, and classroom teaching. For classroom teaching, five subscales have been distinguished:1) Safe and stimulating climate, 2) Clear instruction, 3) Activating teaching, 4) Teaching learning strategies, 5) Adaptation of teaching. Each supervisor rated each item on a 5-point scale (1= insufficient; 5= good) and completed an open-ended question for each subcategory where they could give a more detailed account of their opinions. The supervisor rating form is included in Appendix 2.

Although the observation instrument provides more categories than student questionnaire, they both include classroom management and classroom teaching. It becomes possible to compare these conceptions theoretically.

2.7.4 Reliability and validity

The reliability and construct validity of the structure of the student questionnaire were tested previously by research conducted by Fauth et al. (2014). They gathered questionnaire data from 1556 primary school students (third grade), the analyses show that student ratings can be treated as useful measures of teaching quality in primary school.

For the supervisor rating form, which is used as a common tool to evaluate teaching for more than 200 schools in 14 Chinese cities, showing good reliability, validity,

and intercultural equivalence (Bu & Han, 2019; Li, 2020).

2.7.5 Videotape procedures

To record teaching in the classroom, teachers' lessons were videotaped following the standardized procedures used in the TIMSS Video Study (Stigler, Gonzales, Kawanaka, Knoll, & Serrano, 1999). Videographers shot each lesson using a single camera in the classroom, capturing teaching behaviours during the lesson. The camera was turned on at the beginning of the class and turned off when the lesson was finished, totally about 35 minutes. Teachers were told that the purpose of the study was to videotape typical lessons, and that they were asked not to make any special preparations for the lesson.

2.7.6 Training of students

Students were instructed about the questionnaire in a session of 30 minutes by the first author. The training involved explanations of the student questionnaire and how to evaluate teaching practices using associated scoring rules. After that, students were given enough time to complete the questionnaire in class. The first author stayed nearby and gladly answered any questions.

In this study, we used the supervisors' observation form as our measurement to evaluate teaching. Since supervisors have used the observation form for many years, it seems that the training and computation of reliability measures using the data from the training sessions were inappropriate.

2.7.7 Analysis

Comparing average sum scores is very common in educational research. We first created four variables by calculating the mean scores for classroom management and classroom teaching according to students' and supervisors' evaluations. They were labelled as: students' evaluations of classroom management; students' evaluations of classroom teaching; supervisors' evaluations of classroom management; and supervisors' evaluations of classroom teaching. To explore the relationship between students' and supervisors' evaluations of teaching, a correlation analysis was conducted to measure the strength of association between these variables. A sample t-test was

carried out to determine whether the mean scores significantly differed.

Secondly, to find to further examine the relationship between the evaluation of classroom management and classroom teaching by supervisors and students, we created two cross tables, one for classroom management (Table 2.5), and one for classroom teaching (Table 2.6). In these tables, the 20 teachers were clustered into nine groups, referring to high, medium or low evaluations from either students or supervisors according to their mean scores on each variable (30% of teachers were divided into the high-level group, 40% of teachers were divided into the medium-level group, and 30% of teachers were divided into the low-level group). Finally, 6 teachers were assigned to high level-group, 8 teachers were assigned to medium-level-group, and 6 teachers were assigned to low-level-group.

Thirdly, we selected the teachers with different evaluation scores from students and supervisors and created a table to summarize supervisors' qualitative comments for these teaching according to the observation form. In the table, we provided a comprehensive view by comparing the strong points and weak points of these teaching according to the supervisors to explore the differences between students' and supervisors' evaluations of teaching.

2.8 Results

Table 2.4 shows the results of Pearson correlation between the evaluations of students and supervisors. It indicates that there was a significant positive relation between students' evaluations of classroom management and classroom teaching ($r = 0.77$, $p < .001$), and between supervisors' evaluations of classroom management and classroom teaching ($r = 0.76$, $p < .001$). No significant relationships were found between students' and supervisors' evaluations of the same aspect of teaching: for classroom management ($r = 0.13$, $p = 0.594$). And for classroom teaching ($r = -0.03$, $p = 0.900$).

Table 2.4

The correlations of students' and supervisors' evaluations of teaching (N=20)

	Mean	*SD*	1	2	3	4
1: Students' evaluations of classroom management	3.73	0.63	-			
2: Students' evaluations of classroom teaching	4.20	0.38	0.77**	-		
3: Supervisors' evaluations of classroom management	3.10	0.64	-0.02	-0.03	-	
4: Supervisors' evaluations of classroom teaching	2.92	0.49	0.13	0.05	0.76**	-

A paired t-test was conducted to compare students' and supervisors' evaluations. A significant difference was found for both teaching aspects. Students rated both classroom management and classroom teaching significantly more positive than supervisors (classroom management, $t(19) = 3.36$, $p = 0.003$; and classroom teaching, $t(19) = 8.77$, $p < 0.001$).

2.8.1 Students' and supervisors' evaluations of classroom management

As mentioned above, we have created a cross table to cluster the nine groups of 20 teachers, referring to high, medium or low evaluations from either students or supervisors. Some teachers were rated high on classroom management, whereas supervisors rated them at a medium level. According to supervisors' comments (see Appendix 3), these teachers showed some basic management skills. However, the supervisors mentioned these teachers showed too many controlling behaviours in class. Some supervisors also mentioned the poor management skills of these teachers.

In addition, some teachers were rated at the medium level by their students, but at the low level based on their supervisors. For the teachers with a low level, supervisors indicated that these teachers failed to ensure the orderly progression of the lesson.

Finally, our results also indicated that some teachers were rated at a low level by students, but at the medium level by supervisors. Supervisors reported these teachers showed some basic management skills. But the supervisors noticed that the progres-

sion of a lesson was too fast to allow students to follow teachers' ideas.

Table 2.5

Teachers who were rated at a high level, medium level and low level by students and observers in terms of classroom management

	Supervisor evaluation		
	High	Medium	Low
Student evaluation			
High	23	16, 217, 366, 353	
Medium	228, 428	114, 63, 333, 283	431, 108, 226, 96
Low		315, 42, 65, 208	46

As shown in Table 2.5, some teachers were rated as medium level by both students and supervisors; these teachers were reported as providing some primary management skills. For the teacher who was rated as low level by both students and supervisors (teacher 46), supervisors reported she showed too many controlling behaviours and failed to provide an orderly progression in her lesson.

2.8.2 Student and supervisor perceptions of classroom teaching

As shown in Table 2.6, some teachers were rated high on classroom teaching by their students, whereas supervisors rated at the medium level. Almost all supervisors mentioned that these teachers provided a good learning climate and designed good interactive activities. However, supervisors reported that these teachers failed to involve all students in their lessons, and did not give clear instructions and explanations. In addition, supervisors also suggested these teachers needed to provide more timely help for struggling learners and to use more strategies to motivate students for learning.

Three teachers were rated at the medium level by their students, but at high-level based on supervisors' evaluations. Generally, supervisors reported these teachers were doing very well in many aspects of teaching except creating a relaxed learning atmosphere. We also noticed that three teachers were rated as low level by their students, but at medium level by supervisors. These teachers were considered by their supervisors to show basic teaching skills but failed to build a good learning climate and to implement effective interactive learning activities.

We also noticed that one teacher (teacher 16) was rated as high level, five teachers (teachers 46, 428, 63, 283, 114) were rated as medium level, and two teachers (teachers 109, 431) were rated as low level by both students and supervisors. For the high-level teachers, supervisors reported these teachers showed excellent teaching skills. For the medium level teachers, they mentioned that, although they showed some basic teaching skills and instruction was clear, they still needed to pay more attention to include all students, not just those who study well. For the low-level teachers, supervisors reported that they showed poor teaching skills in the class and their teaching skills needed to be improved (see Appendix 4).

Table 2.6

Teachers who were rated at a high level, medium level and low level by students and observers in terms of classroom teaching

	Supervisor evaluation		
	High	Medium	Low
Student evaluation			
High	16	217, 333, 366,353	
Medium	23, 65, 228	46, 428, 63, 283,114,	226, 96
Low		42, 208, 315	108, 431

2.9 Discussion

In this study, we investigated teachers' classroom management and classroom teaching as evaluated by supervisors and students. Two major findings emerged. First, our results reported indicated students and supervisors might use different criteria to evaluate teaching. In addition, there is a fairly low correlation between students' and supervisors' evaluations of teaching.

2.9.1 Students' and supervisors' evaluations of teaching

First, our findings suggested that both students and supervisors have different views on teaching. Basically, students evaluated their teachers more positively compared to supervisors. In contrast, supervisors hold a more comprehensive, and a higher standard to evaluate teaching compared to students. Specifically, it seems that students and supervisors have different foci in evaluating teaching. Compared to the

aspects of learning climate and activating teaching, supervisors seemed to have more-favourable judgments regarding whether the teacher managed the classroom effectively, used teaching language clearly, and applied teaching strategies appropriately. Especially with respect to teaching strategies, almost all the supervisors mentioned that they paid more attention to check whether the teacher uses appropriate teaching strategies to foster students' ability of critical thinking and break down complicated problems. For supervisors, it seems that using effective teaching strategies is a key factor that determines the quality of teaching. Compared to supervisors, students seemed to be more focused on learning climate, activating teaching, and adapting of teaching. Students rated a teacher highly when the teacher designed a lot of interactions, constantly posed questions, timely praised students or adapted the assignments to relevant differences between students. We even noted that some teachers who failed to show clear instructions and explanations or apply teaching strategies appropriately, were still rated highly by students just as they created a good learning climate. Such findings led us to conclude that students' evaluations of behaviour are not to be interpreted without caution. The reason why students and supervisors have different focuses on the aspects of teaching might be attributable to different perspectives. For supervisors, as the teacher educator, they were trained to use the scoring rules to evaluate teaching, and wanted teachers to apply constructivist teaching approaches in their teaching. This makes them focus more on complex teaching behaviour (i.e., to involve all the students and to apply appropriate teaching strategies) than on some relatively simple teaching behaviour (i.e., to build a relaxed atmosphere), and hold more rigorous quality criteria for teaching. For students, their evaluation is a subjective evaluation based on learning experiences with teachers (Maulana & Helms-Lorenz, 2016). Compared to the complex teaching behaviour, some relatively simple and directive behaviour (i.e., to create a safe and relaxed climate and to provide clear explanations of an assignment) might be easier to recognise and attract their attention. Additionally, one of the purposes of NBE is to support learner-centred teaching (Yan, 2015). Therefore, we expected supervisors would encourage teachers to create a comfortable learning climate and give students more autonomy in the classroom. However, our findings suggest that supervisors paid less attention to the aspect of learning climate and were more focused on classroom management. Some teachers were even rated at a low level by supervisors as they mentioned these teachers provided too much autonomy to students. This finding contradicts some research in other countries that claimed that supervisors focus more

on a supportive learning climate than students (Maulana & Helms-Lorenz, 2016). A more in-depth study is needed because the reasons for these differences remain inconclusive. One possible explanation could be that supervisors may be afraid that creating a supportive learning climate would make the classroom noisy and busy, which affect students' academic performance negatively. As mentioned above, Chinese education is still dominated by high-stakes examinations .

2.9.2 The correlations between the students' and supervisors' evaluations of teaching

Our results indicated that there are fairly low correlations between the students' and supervisors' evaluation of teaching. Our results are compatible with the findings of Maulana and Helms-Lorenz (2016), who also reported a low agreement between students' and external observers' evaluations of teaching. As mentioned above, students and supervisors have different perspectives, which may make students and supervisors have different foci in evaluating teaching. Another possible reason is that compared to the student questionnaire, the observation instrument is more holistic regarding its wording and formulation, and provide additional items that are not present in the questionnaires for students since it is targeted at experienced supervisors. In contrast, the items of the student questionnaire are more specific and formulated to student perceptions in primary education. These differences in operationalization at the item level may also contribute to the low correlations. The low correlations mean that using either evaluation of students or ratings by supervisors may lead to a one-sided and incomplete view of teaching. To best determine the quality of teaching in a professional learning programme, it may be worth including these two measures in the evaluation system as they each provide a different view on teaching.

Finally, although they have different judgments regarding teaching, it seems that both supervisors and students care about whether the teacher involves all students in the classroom. Supervisors reported that most teachers have the ability to adapt their teaching to the differences between students. However, in practice, supervisors indicated that it seemed that some teachers only invited good learners to answer their questions and participate in learning activities, ignoring struggling learners.

2.9.3 Implications

Our findings can have implications for school leaders and policymakers to evaluate teaching.

First, our study suggests that primary school students rated their teaching higher than universities supervisors, and more-favourable judgments regarding learning climate, activating teaching and adaptation of teaching, however, may be less able to rate some specific aspects of teaching than supervisors (i.e., clarity of instruction and teaching strategies). Therefore, if principals want to use students' perceptions to evaluate teaching, they should be aware that the weakness of using evaluations of students. For the teachers who are rated highly by students, it might be necessary to invite supervisors to further rate their performance in the classroom, especially in the aspects which students are less focused.

Second, for the supervisors, compared to students' evaluation, their comments are more critical, and more able to rate whether the classroom is managed effectively, and teaching strategies are applied reasonably. It seems that supervisors' perceptions could be used to help teachers to develop their "senior skills" of teaching quality. However, considering using observation measure is costly and labour-intensive, most schools still use students' perceptions to evaluate teaching, supervisors' comments could be used as a supplement to assess to what extent teaching meets teaching standards in the specific aspects of teaching.

Finally, the results of the evaluation of teaching will differ substantially depending on which of the two rater-groups is used. Given both observations and student surveys have strengths and weaknesses, it might be important for principals to select different measures depending on different purposes. Summative and formative purposes are the most cited purposes of teacher evaluation in the literature (Stronge, 2006). When principals want to use summative evaluation of teaching, they might use student evaluations of teaching. When principals want to implement collegial consultation and peer feedback/assessment to improve teaching, it might be better to use supervisor comments. As a formative assessment, the supervisors' evaluation embeds assessment processes throughout the teaching process to constantly improve teaching. Teachers and principals can use these to find out how the teacher is teaching, as well as what they need to do next to move their teaching forward.

2.9.4 Limitations

Generally, there are three limitations that should be carefully considered when interpreting our conclusions.

First, our study only used quantitative methodologies to explore student evaluation of teaching. Such quantitative measures help us to recognise scores in the specific aspects of teaching. However, we still do not know why students gave such scores. We can only speculate about the reasons based on supervisor descriptions. It would have been informative to include student interviews into our study. Such information may provide us with a deeper understanding of students' evaluations of teaching. We advise future studies use both quantitative and qualitative methodologies to explore how students and supervisors perceive teaching, and compare similarities and differences in the specific aspects of teaching.

Second, in order to determine supervisors' evaluations of teaching quality, the selection of supervisors for the sample was very important. In this study, supervisors were selected carefully to arrive at a diverse sample. However, our samples relied on supervisors who volunteered to participate in this study. This selection might have influenced the findings.

Third, although stratified random sampling was used to select teachers, our sample was relatively small (N= 20 teachers), which might influence the generalization of findings.

2.9.5 Concluding remarks

In this study, the evaluations of the teaching of supervisors and students were compared, and the results showed significant differences. The differences provide us with the opportunity for a better understanding of how students and supervisors perceive teaching. Such knowledge would be beneficial for classroom researchers to determine if a particular method of data gathering would generally be useful for measuring teaching behaviour. It also indicates that the reality of the teaching situation is not based on one 'truth'; each source brings different perspectives on teaching. Using only evaluations of either supervisors or students may lead to a one-sided and incomplete view. Therefore, we recommend teachers, policymakers, and school

leaders to focus more on the selection of multiple measures to evaluate teaching behaviour and choose the appropriate method according to different purposes.

3

UNIVERSITY-SCHOOL PARTNERSHIP IN CHINA: PERSONAL AND SCHOOL WORKING CONDITIONS, AND PRINCIPAL LEADERSHIP THAT EXPLAIN CHANGES IN TEACHING

Abstract

In China, New Basic Education (NBE) is a collection of continuous professional development for teachers' involving teacher educators who visit schools. This study explores teachers' personal factors, school working conditions, and principal leadership explaining differences in teachers' learning when they have participated in the training program. In one-group pre-test post-test design, 375 teachers from 12 primary schools in Shanghai participated. Their learning performance is measured by the change in their teaching quality evaluated by their students. Results of regression analyses show that teachers generally receive higher scores on their teaching quality after the program than before. Three factors are significantly and negatively related to the change in quality: teachers' educational level, the extent to which teachers feel emotional pressure in their profession and the support from their school principal. Implications for school leaders and policymakers are discussed.

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3.1 Introduction

Teaching is considered to be one of the most important predictors of students' learning outcomes (Seidel & Shavelson, 2007). As a consequence, more and more professional development (PD) programs are designed to improve teachers' use of various instructional practices effectively in class. In China, many large-scale education reforms have been launched as a result of the strong demand for teachers to learn how to improve their teaching to meet the challenges of a fast-changing society. One of these reforms is the New Basic Education (NBE). In the NBE, teacher educators from universities go to schools and based on class observation they provide teachers feedback on how to improve their teaching (Yuhua & Jiacheng, 2013). However, research on the impact of teachers' PD programs has indicated that it is not easy for teachers to make drastic changes to the teaching approaches to which they have been accustomed for years (Desimone, 2009). Teachers' personal factors (Ryan & Weinstein, 2009), as well as working conditions (Geijsel, Sleegers, Stoel, & Krüger, 2009), may affect teachers' learning when they participate in PD programs.

In addition, although the NBE is regarded as an effective PD program, it is not readily supported by all school principals. The NBE emphasizes teachers to base their teaching on students' interests, creative spirit, and teamwork skills rather than students' academic scores, whereas school principals generally focus on high student academic achievement in public examinations (Zhao et al., 2014). Yet leadership is only one – though important – factor that can explain differences in teachers' learning in PD. Therefore, this study aims to contribute to understand which teachers' personal factors, school working conditions, as well as principal leadership, are related to the effects of a PD program in terms of teaching quality.

3.2 New Basic Education

GaoKao (The National College Entrance Examination) is an academic examination held annually in China. Students are only allowed to enter a university (especially a prestigious one) when they pass the examination, which therefore has a significant impact on individual student life (Yu et al., 2016). GaoKao is always criticized for limiting students' deep learning and creativity (Yu et al., 2016). In light of the importance of examination success, school principals single-mindedly focus on the

students' academic scores rather than students' interests, creative spirit, and teamwork skills to ensure high student academic achievement in public examinations. Accordingly, teachers' teaching practices emphasize knowledge delivery, memory-driven learning, and teacher-centred approaches (Xin & Fred, 2014). This contradiction between the quality-oriented ideal and the test-oriented educational reality aroused Chinese scholars' concerns. In order to change this situation, they designed various innovations to improve teaching quality. A notable example in China is New Basic Education. The purpose of the NBE is to counteract the broadly criticized test-oriented education in China (Dello-Iacovo, 2009) and help teachers to reduce teacher-centred teaching in favour of student-centred approaches. Teacher educators from universities go to schools to use various ways *(see Introduction Table 1.1)* to continuously support teachers' development in school. They encourage teachers to support students as 'active learners', who creatively solve problems, challenge existing knowledge, and participate in lively teamwork (Yuhua & Jiacheng, 2013).

3.3 Teachers' learning in PD programs

A growing body of literature confirms that PD can impact teaching practices. Teachers can learn from PD by observing, asking questions, and actually participating alongside teacher educators. It will eventually lead to a change in teachers' knowledge and teaching practices. However, teachers tend to assimilate new notions into their existing belief systems when they are implementing new approaches (Desimone, 2009). It indicates that teachers' implementation of new teaching approaches may be influenced by teachers' personal characteristics. In addition, as a member of a school community, teachers' learning is social rather than being solely individual. The support from external sources is very important for the development of teaching quality, especially when they intend to experiment with newly acquired knowledge and skills (J.-W. Zhang, Lo, & Chiu, 2014). Based on the literature on factors related to the effects of teachers' PD programs (e.g., Blume, Ford, Baldwin, & Huang, 2010; Wal, van den Beemt, Martens, & den Brok, 2020; Leithwood & Jantzi, 2005; Louws, Meirink, van Veen, & van Driel, 2018; Mintzes et al., 2013; Roehrig & Kruse, 2005), we will provide a framework to discuss the potential factors distinguishing between teacher personal factors, their school working conditions and their principal's leadership.

3.3.1 Teacher characteristics

Teacher personal factors can be divided into two aspects: (1) teacher characteristics and (2) teacher psychological factors. For teacher characteristics, teachers' teaching experience and educational level are included in this study because of their significance in other studies. Some researchers have reported that teachers' teaching experience affects their learning in PD programs. For instance, in a study exploring the professional learning goals of early-mid-and later-career teachers, Louws et al. (2018) report that early-career teachers spoke more explicitly about the specific skills that they would like to learn in order to become better teachers, compared to teachers with more teaching experience. Similary, Maskit (2011) indicates that teachers displayed significant differences in attitudes towards pedagogical changes at different stages of their careers with early-career teachers being more likely to alter their style of instruction than those in more stable stages. Such findings are also found by Hildebrandt and Eom (2011), who report that inexperienced teachers showed higher needs for achievement and growth compared to experienced teachers. To pursue greater achievements, inexperienced teachers showed more willingness to learn and had a better learning performance compared to experienced teachers.

Previous studies have been conducted on the relationship between teachers' educational level and teachers' learning in PD programs, albeit with inconsistent findings. Some researchers indicate that teachers' educational level is positively related to teachers' learning performance. Teachers with higher educational level were more confident about their ability of learning and more willing to change what they were so used to doing in the classroom (Tschannen-Moran & McMaster, 2009). However, some other studies indicate that teachers with higher educational level were more confident and satisfied in their teaching, had less willingness to alter their way of teaching (Supovitz et al., 2010; Zhao et al., 2014). Due to these contradictory findings, the direct relation between teachers' educational level and learning in PD programs requires further investigation.

3.3.2 Teacher psychological factor

Previous studies have reported that teachers' psychological factors, such as beliefs in learning (Roehrig & Kruse, 2005), self-efficacy (Mintzes et al., 2013), and teachers' learning motivation (Blume et al., 2010) influence their learning performance during

PD programs.

Teachers' beliefs of learning, which refers to what teachers know about learning and how they think they learn may contribute to understanding the troubles and pitfalls in learning (Bolhuis & Voeten, 2004), can directly shape teachers' reactions to professional learning (Roehrig & Kruse, 2005), and how they utilize their pedagogical knowledge in the classroom (Morine-Dershimer & Kent, 1999). Several authors also claim that teachers' beliefs about learning seem to be important for the effects of teachers' PD programs. For example, Bolhuis and Voeten (2004) found that teachers with stronger beliefs in intelligence as a malleable quality were more concerned with developing their teaching competence and were more persistent in their learning activities. Whereas teachers with more beliefs in intelligence as a fixed quality were more likely to give up when confronted with difficulties in PD programs.

When it comes to self-efficacy, which refers to the beliefs in teachers' capability to make a difference in student learning (Tschannen-Moran, Hoy, & Hoy, 1998). Many studies have indicated that perceived self-efficacy influence teachers' learning when they participate in PD programs. However, their conclusions are inconsistent. For example, Tschannen-Moran and Hoy (2001) found that the more self-efficacy teachers had in their teaching, the more willing they were to demonstrate acceptance of new ideas and experiment with new instructional methods. Similarly, Geijsel, Sleegers, Stoel, and Krüger (2009) showed that teachers with a strong belief in their own capabilities were more involved in learning activities, showed more enthusiasm and passion for learning, compared to the teachers with low self-efficacy. Other authors, however, came to a somewhat different conclusion, indicating that teachers with more confidence in, and satisfaction with, their teaching showed less willingness to learn and to alter their way of teaching (e.g., Supovitz et al., 2010).

For learning motivation, which refers to reasons for engaging in learning activities (Deci & Ryan, 2002). Some researchers report that when teachers are highly motivated to learn, they may have more successful learning experience, which may contribute to their implementation of new approaches from PD programs (Bolhuis & Voeten, 2004; Donche & Van Petegem, 2011). In a study to explore the relationship teachers' self-efficacy, Suchodoletz, Jamil, Larsen, and Hamre (2018) come to a similar conclusion, indicating that teachers who are more motivated to participate in learning activities may acquire more teaching techniques, and ultimately increase

their willingness to implement new teaching strategies.

3.3.3 Working conditions

Based on the study of the psychosocial workload of teaching (Veldhoven & Meijman, 1994), Wal et al. (2020) divided teachers' perceptions of workplace conditions into four aspects:

- *Task autonomy,* which comprises the extent to which teachers can decide on when and how to execute their work;
- *Colleague support,* which refers to helpful social interactions available from colleagues on the job;
- *Work pressure,* which refers to challenging aspects of the job, such as work load and the pace of work;
- *Emotional pressure,* which concerns the extent to which teachers perceive their jobs to require emotional investment, such as emotional load, mental strain or suspense;

Many studies have indicated that these four variables may affect teachers' learning in PD programs. For example, according to Rosenholtz (1989), the more emotional pressure teachers perceive in school, the more reluctant they are to learn or to attend PD. In addition, in a survey study with 502 teachers from 32 elementary schools in the Netherlands, Thoonen et al. (2011) found that task autonomy may reinforce the extent to which school values are internalized as teachers' personal goals and subsequently affect their learning from PD activities.

3.3.4 Principal transformational leadership

A number of leadership concepts have been posited to describe various principal leadership practices, such as transformational leadership (Finnigan, 2010), transactional leadership (Eyal & Roth, 2011), and instructional leadership (S. Liu, Hallinger, & Feng, 2016). However, it is the literature on "transformational leadership" that provides useful insights into the role of the principal in the context of teachers' learning and school improvement (Y. Yang, 2014). Transformational leadership focuses on development for the purpose of change and motivates followers to do more

than they originally expected or they thought possible (Bass & Avolio, 1994). Bass (1985) identified three aspects of transformational leadership: stimulating version building, providing individualized support, and supporting intellectual stimulation. Version building refers to stimulate teachers' willingness to internalize organizational goals as their personal goals, increasing their sense of belonging in schools. Individualized support represents an attempt to understand and satisfy teachers' needs to increase their sense of self-efficacy. And intellectual stimulation encourages teachers to question their own beliefs, assumptions and enhance teachers' willingness to learn and improve their learning ability. In this study, we focus on intellectual stimulation, which means that transformational school leaders can help teachers to reflect on their own beliefs, and values, and encourage them to update their traditional approach by the implementation of new teaching approaches. Previous work shows that principals as transformational leaders use intellectual stimulation to enhance teachers' learning performance and help them in their PD (Leithwood & Jantzi, 2005; Silins, 1994).

3.4 This study

The present study focuses on the evaluation of the development of teaching quality after a period of participating in the NBE. Two common methods for measuring the quality of teaching practice are registration methods, such as classroom observation and methods based on perceptions, mostly student surveys (Hassan & Wium, 2014). Students can evaluate the deeper structure without using surface indicators, they have a good understanding of how interesting or difficult an instruction is in general and their feedback can help to improve teaching (Dockterman, 2017a). Therefore, we use students' perceptions to evaluate the change in teaching quality in this study.

Most studies focus on teaching, learning, or implementing an educational innovation in a Western cultural setting. Empirical investigations into the influential factors in the change in teaching quality of Chinese teachers in the university−school partnership are still scarce. Some studies have indicated that Chinese culture has a great influence on Chinese teachers' teaching and future PD (Kennedy, 2002; Shi, 2006; Walker & Qian, 2015; Wong, 2001), particularly for the role of school principals as they are always treated as playing a managerial and political role in the Chinese educational system. This study was conducted in Shanghai, a Chinese society; we expect that the non-Western cultural setting will provide a valuable view of the rela-

tionship between these influential factors and the effects of PD program with respect to teaching quality. Compared with previous studies, the present study provides a comprehensive overview of teacher characteristics (e.g., educational level, teaching experience), teacher psychological factors (e.g., self-efficacy, learning motivation, conception of learning), working conditions (e.g. work and emotional pressure, task autonomy, colleague support) and principal leadership that are related to change in teaching quality in a Chinese context. The following research questions are addressed:

1: Do teachers increase their teaching quality as evaluated by their students during participation in the NBE program?

2: How are teacher personal factors, school working conditions and principal's transformational leadership related to the change in teaching quality?

3.5 Methods

3.5.1 Participants and procedure

This study is situated in the NBE implemented by East China Normal University in Shanghai, China. Shanghai used to classify schools into "key" and "ordinary" and gave additional resources to "key" schools (Pye, 1997). Although these labels now have been removed, the previously classified key schools remain privileged and have a better teaching quality than ordinary schools (Qian & Walker, 2013). Consequently, considering the quality of schools, we selected 12 schools from 20 schools that were recommended by East China Normal University: 6 schools from "key" schools and 6 schools from "ordinary" schools. Finally, a total of 375 teachers from 12 primary schools who were active in the NBE program participated in this study. Two waves of questionnaire data were collected. The first questionnaire (T1) was administered in October 2017, and the second (T2) was in April 2018. Participation in the study was strictly voluntary and confidential for teachers and students. Ethics approval for this study was granted by the Leiden University Graduate School of Teaching (ICLON).

Sample statistics and population parameters regarding age, gender, teaching experience, educational background, and other information are presented in Table 3.1.

The teachers who participated taught a large array of subjects (including Chinese, English, mathematics, music, art, science, history, among others). On average the teachers were 37.6 years old (SD=8.3). Teachers completed their questionnaires in their office.

Table 3.1
Participant information (N=375)

		Participants
Gender	Female	342
	Male	33
Subject	Chinese	128
	English	98
	Math	83
	Art	19
	Music	15
	Others	32
Teaching experience	0−3 years	41
	4−6 years	59
	7−18 years	117
	19−30 years	134
	31−plus years	24
Educational background	Diploma of Secondary vocational school	2
	Senior college degree	28
	Bachelor's degree	290
	Master's degree	55

3.5.2 Teaching quality

NBE focuses on three aspects of teaching: classroom climate, classroom management, and cognitive activation. Classroom climate support includes specific aspects of a positive teacher−student relationship and constructive teachers' feedback. In order to enhance a positive climate, teachers should provide extra help when needed,

respect students' questions, and care about the students. It is assumed that a positive student−teacher relationship fosters students' intrinsic motivation and subject-related interest, which in turn are crucial for students' learning gains. Classroom management refers to classroom rules and procedures, coping with disruptions, and providing smooth transitions, which are crucial for students' learning gains. Cognitive activation encourages students' cognitive engagement by integrating various tasks, exploring theoretical conceptions, and applying knowledge. A growing global literature reports that these three aspects reflect the key aspects of teaching quality, and are positively related to student academic achievement and subject-specific interest (Ferguson, 2012). Accordingly, in this study, a teacher teaching quality questionnaire was administered to students to assess teacher teaching in class (Fauth et al., 2014). The instrument consists of three subscales: classroom management (5 items); cognitive activation (7 items); supportive climate (9 items), a total of 21 items. Students are asked to evaluate their teaching quality from 1= strongly disagree to 4= strongly agree. The 21 items were subjected to an exploratory principal component factor analysis to determine the underlying factors. The final analysis consists of two components of 19 items, which explain 41.9% and 11.5% of the variance in scores, respectively. The first component includes cognitive activation and supportive climate; it is labelled 'classroom teaching', indicating exploration of students' prior knowledge, the way of thinking, and a good relationship between teachers and students. The second component is labelled 'classroom management', with items on classroom rules and procedures dealing with disruptions, and ensuring smooth transitions in the classroom. The Cronbach's alphas of classroom teaching and classroom management are 0.91 and 0.89, respectively.

3.5.3 Teacher characteristics

Teacher characteristics included educational background, teaching experience and prior experience with NBE. Teachers' teaching experience were divided into five categories (Huberman, 1989): 0−3 years of teaching experience (Career Entry Stage); 4−6 years of teaching experience (Stabilization Stage); 7−18 years of teaching experience (Experimentation−Diversification Stage);19−30 years of teaching experience (Serenity Stage); and 31 or more years of teaching experience (Disengagement Stage).

3.5.4 Teacher conceptions of learning

To capture teacher conceptions' of student learning and their own learning, 46 items are derived from the teacher conception questionnaire which has five subscales: External versus Internal Regulation; Reproductive versus Constructive Knowledge; Individual versus Social Learning; Fixed versus Dynamic Ability; and Intolerance of Uncertainty versus Tolerance of Uncertainty. (Bolhuis & Voeten, 2004). Teachers were asked to state to what extent they agree with the learning conception for themselves and for their students. A four-point scale is used: (1) I quite agree with the statement on the left; (2) I agree somewhat more with the statement on the left than I do with the one on the right; (3) I agree somewhat more with the statement on the right than I do with the one on the left; and (4) I quite agree with the statement on the right. Reliability analysis of teacher conception of student learning reveals that the reliability of only Reproductive versus Constructive Knowledge (α=0.64), Individual versus Social Learning (α=0.59) and Fixed versus Dynamic Ability (α=0.67) is acceptable. For teacher conception of their own learning, only Fixed versus Dynamic Ability (α=0.67) shows satisfying reliability. These four scales are labelled 'conception of student knowledge', 'conception of student teamwork', 'conception of student ability' and 'conception of their own ability'.

3.5.5 Teacher self-efficacy

Teachers' self-efficacy has been assessed using the Teachers' Sense of Efficacy Scale (TSES, 12 items) developed by Tschannen-Moran and Hoy (2001), which has three subscales: 1) instructional strategies; 2) classroom management; 3) student engagement. The 12 items have been subjected to an exploratory principal component factor analysis with oblimin rotation to determine underlying factors. The final factor solution results in two components with 11 items, which explaine55.3% and 9.6% of the variance in self-efficacy scores, respectively.

The first component is labelled 'efficacy in teaching'(7 items) and includes items from the original scale instructional strategies and student engagement. Example items are 'How much can you do to motivate students who show low interest in school work?' and 'To what extent can you craft good questions for your students?' The second component is labelled 'efficacy in classroom management' (4 items). An example item is 'How much can you do to control disruptive behaviour in the class-

room?' Teachers were asked to indicate their feeling of self-efficacy on a nine-point scale: 1= nothing, 3= very little, 5= some influence, 7= quite a bit, 9= a great deal. The Cronbach's alphas of the two factors are 0.88 and 0.88, respectively, showing satisfying reliabilities for both scales.

3.5.6 Teacher motivation for participation in PD

Teachers' motivation to participate in PD programs has been assessed with the Teacher Motivation Inventory (Lam, Cheng, & Choy, 2010). The instrument consists of four subscales (external regulation, introjected regulation, identified regulation, intrinsic motivation) with five items per scale, a total of 20 items. The items were presented randomly. Teachers were asked to indicate their feeling of motivation on a five-point scale (1=Strongly Disagree, 2=Disagree, 3=Neither Agree nor Disagree, 4=Agree, 5=Strongly Agree). The 20 motivation items are subjected to an exploratory principal component factor analysis to determine underlying factors. Three components of 16 items are extracted, which explain 44%, 15%, and 7.7% of the variance in motivation scores, respectively. The first component includes intrinsic motivation and identified regulation. According to the perspective of self-determination theory (Deci & Ryan, 2002), the combination of intrinsic motivation and identified regulation is designated as autonomous motivation; therefore, the first component has been labelled 'autonomous motivation'. This means that teachers engage in a learning activity for the inherent enjoyment and pleasure, or the pursuit of a meaningful outcome from the activity. One example item is 'I participated because I am interested in it'. The second component has been labelled 'external regulation', which implies that the reason why the teacher engages in activities is to attain material incentives, recognition or rewards, or to avoid punishment. An example item is 'I participated because it was a duty assigned by my school'. The third component has been labelled as introjected regulation: where self-determination is relatively higher than in the case of external regulation, it involves taking in regulation but not fully accepting it as one's own. It is a relatively controlled form of regulation in which behaviour is performed to avoid guilt or to attain ego enhancements, such as pride. An example item is 'I participated because I would feel embarrassed to explain my absence to others'. The Cronbach's alphas of autonomous motivation, external regulation, introjected regulation are 0.94, 0.83, and 0.62, respectively, showing satisfying reliabilities for each scale.

3.5.7 Perceived workplace conditions

The Dutch Questionnaire Social Psychological Work Demand (Veldhoven & Meijman, 1994) has been used. It has three subscales: pressure from work features and emotional aspects of work; task autonomy; and support from colleagues. We conducted an exploratory principal component factor analysis to determine the underlying factors. Four scales were distinguished:1) Emotional pressure (4 items), indicating teacher emotional pressure at work, with items such as, 'Are you confronted in your work with situations that affect you personally?' and 'Do you experience a major emotional workload?'; 2) Task autonomy with 4 items explaining 15.5% of the variance in scores, showing teacher's autonomy at work, with items such as: 'Can you decide for yourself how you carry out your work?' and 'Can you do your job at your own pace?'; 3) Colleague support with 4 items explaining 10.2%, indicating teachers received support from colleagues, with items such as: 'My fellow colleagues give notice to what I say?' and 'My fellow colleagues are willing to listen to my work-related problems?'; and 4) Work pressure, 5 items explaining 7.1%, showing teachers perceived pressure from their work, with items such as: 'Do you have to work very fast' and 'Do you have too much work to do?' The Cronbach's alphas of emotional pressure, work pressure, task autonomy, colleague support is 0.81, 0.73, 0.62, and 0.68, respectively. This indicated a satisfying-reliability.

3.5.8 Principal transformational leadership

Principal transformational leadership has been measured by six items from the aspect of intellectual stimulation (Geijsel et al., 2009). An example item is 'As a precondition for catering to teachers' interests, the headmaster encourages teachers to attempt innovation'. All items are scored on a four-point Likert-type scale: 0=never, 2=sometimes, 3=often, 4=always. The Cronbach's alpha for principal support is 0.91, indicating satisfactory reliability. Table 3.3 provides descriptive statistics for the dependent and independent variables.

Table 3.3

Descriptive statistics for dependent and independent variables

	Number of items	Mean	SD	α	N
Teaching quality					
Change in classroom teaching	10	0.05	0.30		375
Change in classroom management	3	0.09	0.48		375
Teacher characteristics					
Educational level	4				375
Teaching experience	5				375
Efficacy in classroom teaching	7	6.37	1.02	0.88	375
Efficacy in classroom management	4	6.94	1.24	0.88	375
Conception of student knowledge	4	3.50	0.51	0.64	375
Conception of student teamwork learning	5	3.27	0.53	0.59	375
Conception of student ability	4	3.08	0.56	0.67	375
Conception of their own ability	4	3.35	0.54	0.67	375
Autonomous motivation for learning	10	3.91	0.64	0.94	375
External regulation for learning	3	3.48	0.91	0.83	375
Introjected regulation for learning	3	2.94	0.76	0.62	375
Working conditions					
Emotional pressure	4	2.26	0.64	0.81	375
Work pressure	3	3.28	0.59	0.73	375
Colleague support	4	2.80	0.49	0.68	375
Task autonomy	4	2.20	0.56	0.62	375
Principal leadership	6	3.07	0.65	0.91	375

3.6 Analysis

First, paired-samples t-test is carried out for two teaching quality scales separately to test whether the change between time 1 and 2 was significant. Then we have created new variables by calculating a difference in teaching quality between the two moments. These two teaching quality variables are treated as dependent variables

for answering research question 2. They have been labelled as 'change in classroom teaching' and 'change in classroom management'. And then, as data are nested (teachers within the school), multilevel variance components analyses are carried out for each teaching scale. For both scales, we found no significant variance at the school level (with **α = 0.05)**. Therefore, stepwise regression analyses have been performed at the teacher level only to assess the relationship between teacher personal factors (educational level, teaching experience, self-efficacy, conceptions of learning, learning motivation), working conditions (work, and emotional pressure, task autonomy, colleague support), and principal transformational leadership, one the one hand, and change in teaching quality (classroom teaching and classroom management), on the other hand. These regression analyses have been performed for each dependent variables separately although the correlation between change in classroom teaching and change in classroom management was quite high (r= 0.64).

3.7 Results

The results of the paired-samples t-test indicate a significant difference in the scores for classroom teaching at time 1 (Mean= 2.88) and time 2 (Mean= 2.97; t (378)= -3.73, p< 0.001), and for classroom management at time 1 (Mean= 3.36) and time 2 (Mean= 3.41; t (378)= -3.41, p= 0.001). Then the results of the two multiple regression analyses indicate that teachers' educational level and transformational leadership from school principals are negatively related to change in classroom teaching, and emotional pressure and transformational leadership from school principals are negatively related to the change in classroom management. The final models are shown in Table 3.4.

3.7.1 Factors related to change in classroom teaching

For the change in classroom teaching, the result of the regression showed that the model is a significant predictor of teachers' change in classroom teaching (F(2, 372)= 5.89, p= 0.003, R^2= 0.031). Two variables are significant predictors: principal transformational leadership (B= -0.064, SE= 0.02; p= 0.008) and teachers' educational level (B= -0.071, SE= 0.03, p=0.024). This means that the more teachers perceived transformational leadership from their principals and the higher the educational level of the teachers, the less they have changed their classroom teaching

during the program.

3.7.2 Factors related to change in classroom management

For the change in classroom management, the result of the regression indicated that the model is a significant predictor of teachers' change in classroom management ($F(2, 372)= 4.59$, $p= 0.011$, $R^2= 0.024$). Emotional pressure (B= -0.086, SE= 0.04, p= 0.028) and principal transformational leadership (B= -0.088, SE= 0.04, p=0.024) contributed significantly to the model, which means that the more emotional pressure teachers reported and the more transformational leadership the principal demonstrated, the less the improvement in their classroom management during the program.

Table 3.4

The result of multiple regression analyses of the changes in classroom teaching and classroom management

Predictor	Change in classroom teaching			Change in classroom management		
	B	S.E.	Sr^2	B	S.E.	Sr^2
Teacher characteristics						
Educational level	-0.071*	0.03	0.013	-0.059		
Teaching experience	-0.002			-0.038		
Efficacy in teaching	-0.061			-0.020		
Efficacy in management	0.070			-0.002		
Conception of student knowledge	-0.023			-0.044		
Conception of student teamwork learning	-0.062			0.008		
Conception of student ability	0.032			-0.005		
Conception of their own ability	0.035			0.038		
Autonomous motivation for learning	-0.001			0.030		
External regulation for learning	-0.015			0.003		
Introjected regulation for learning	0.037			0.087		
Working conditions						
Emotional pressure	-0.043			-0.086*	0.04	0.012
Work pressure	0.001			-0.059		
Colleague support	0.001			0.051		
Task autonomy	0.042			0.016		
Principal leadership	-0.064**	0.02	0.018	-0.088*	0.04	0.013
R^2	0.031			0.024		

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

3.8 Discussion and conclusion

The present study helps to identify the important teacher characteristics, working conditions, and principal leadership with respect to teachers' change in teaching quality after six months of NBE. The results show that the transformational leadership from school principal and teachers' educational level are negatively related to the change in classroom teaching, and that transformational leadership from school principal and emotional pressure are also negatively related to the change in classroom management.

3.8.1 Emotional pressure and teachers' learning in PD

First, emotional pressure is negatively related to a change in teachers' classroom management, but not to a change in classroom teaching. This finding is in line with previous studies (see.e.g., Lewis, 1999) showing that pressure has a direct negative impact on teachers' ability to deal with classroom discipline (Kaldi, 2009), student misbehaviour (Lewis, Romi, Qui, & Katz, 2005), and students' inattentive behaviour (Ding, Li, Li, & Kulm, 2010). It seems that teachers who feel emotional pressure may not feel mental space to improve their classroom management. Pelletier et al. (2002) have pointed out that the negative influence of pressure on teachers' instruction is crucial. Teachers who are under more pressure are more likely to teach in a routine way, keeping their present method of instruction, thereby avoiding change and possible mistakes.

3.8.2 Teachers' educational level and teachers' learning in PD

We also find that teachers' educational level is negatively related to the change in classroom teaching. One explanation is that teachers with higher educational level are more confident about their teaching and more reluctant to change what they are so used to doing in the classroom. Some studies also indicated that teachers with more confidence and satisfaction in their teaching have less willingness to alter their way of teaching (Supovitz et al., 2010; Zhao et al., 2014). Another possible reason is that teachers with higher educational level might already have a better teaching quality than teachers with lower educational level. Compared to the teachers with lower educational level, it might be harder for them to continuously improve their instruc-

tional quality.

3.8.3 School principal leadership and teachers' learning in PD

We also found that the more teachers perceive leadership from their principal, the less they change their teaching quality. This finding seems to contradict the findings of some research claiming that leadership from principals has a positive influence on teachers' learning (Supovitz et al., 2010; Thoonen et al., 2011). An explanation for this finding, which seems to be contradicting other research findings at first sight, might be that teachers from our study did not experience the items from our transformational leadership scale as supportive. This scale has been developed and used in a Western-European context (Geijsel et al., 2009). The way the items have been formulated might lead to an interpretation of pressure instead of support from the principal. For example, the item "As a precondition for catering to teachers' interests, the headmaster encourages teachers to attempt innovation" might not have been interpreted as 'encouragement', but as 'control', 'urging' or 'pushing' by the principal. Some research which is conducted in the Eastern context also confirms this negative relationship between principal leadership and teachers' learning in PD (Qian & Walker, 2013; Xin & Fred, 2014). Therefore, we suggest to develop a principal transformational leadership scale that is better aligned with the educational and cultural context in which it is used.

3.8.4 Implications for school principals

Based on our findings, we suggest three implications for practice of school principals. First, our results indicate that emotional pressure was negatively related to teachers' learning. Consequently, when school leaders wish to improve the quality of teaching for teachers, it might be recommendable that support of their teachers to cope with the stress is into place first. This support structure can include support of colleagues and school administration as well as teachers' autonomy in the workplace (Harmsen, Helms-Lorenz, Maulana, & van Veen, 2018). This support structure can provide teachers with enough mental space to learn and improve their qualities from PD programs.

Second, we have found a negative relationship between teachers' educational level

and their learning. School principals could provide more challenges to teachers with high educational level to not only make their work more fulfilling, but also stimulate their willingness to acquire new capacities to take up these challenges. These new challenges can be related to innovative pedagogies, providing help for their colleagues, or building an autonomy-supportive working environment.

Finally, our findings suggest that school principals not always seem to have a positive influence on teachers' implementation of new approaches from NBE. Possibly, principals could place teachers in a better position to meet further requirements of PD programmes. In addition, they could offer teachers sufficient scaffolding and autonomy when teachers participate in educational reforms. In this way, school teachers may benefit from the PD program that will help them be more innovative and forward-looking.

3.8.5 Limitations

One limitation we would like to address is that we used only quantitative methodologies to explore the relationship between influential factors and the change in teaching quality. However, as teachers' instruction is a complex behavior and various psychological and organizational factors affect teaching, we advise future studies should use a mix of quantitative and qualitative methodologies (e.g., in-depth face-to-face interviews) to provide a better understanding of the influence of these factors on teaching quality.

3.8.6 Concluding remarks

To conclude, our study has shown the negative influence of school leaders, emotional pressure, and teacher's educational level on the development of teaching quality during the NBE program. In particular, our result indicated that the support from Chinese school principals can be crucial for the improvement of teaching quality when teachers are involved in a PD program that emphasizes new teaching approaches. Principals can directly and indirectly support teachers to benefit from PD program and use their newly acquired knowledge and skills for their teaching practice.

4

STUDENT PERCEPTIONS OF TEACHING: RELATIONSHIP WITH TEACHER PSYCHOLOGICAL FACTORS, WORKING CONDITIONS, PRINCIPAL LEADERSHIP

Abstract

Student perceptions of teaching have been regarded as a significant predictor of student learning outcomes. Research on school-teachers'' teaching has indicated that various factors are related to student perceptions of teaching. This study explores the relationship between a teacher's personal and environmental factors and student perceptions of teaching. Data were collected from a survey of 11,705 primary students and 419 teachers from Shanghai, China. Structural equation modelling revealed that teachers' sense of self-efficacy appeared to be an important predictor for student perceptions of teaching. Moreover, self-efficacy also mediates the positive indirect relationships of task autonomy, support from principals, colleagues and teacher educators with student perceptions of teaching. These findings can guide school leaders and policymakers to implement strategies to further improve teaching practices.

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4.1 Introduction

Numerous studies have clearly revealed that students' learning outcomes highly depend on their perceptions of teaching (Scherer et al., 2016; Thoonen et al., 2011). Given this relationship, student perceptions of teaching quality have received attention in the last decades as a way to indicate teaching quality (Scherer et al., 2016). Previous studies have demonstrated that various school environmental factors may affect teaching quality, such as leadership from school leaders (Ng & Pun, 2013), support from colleagues (Supovitz et al., 2010), task autonomy (Q. Wang & Zhang, 2014), and pressure from work (R. Richards, Hemphill, & Templin, 2018). Furthermore, many studies reported that the relationship between environmental factors of the school organization and teaching might be mediated by teacher psychological factors as teachers might appraise the environmental strains differently (Herman, Prewett, Eddy, Savala, & Reinke, 2020; R. Richards et al., 2018). It means that teacher characteristics have the potential to play as mediators to explain how the influence of working conditions on teaching quality through teacher individual characteristics. We assume that particular work features such as work pressure and lack of autonomy may affect teacher characteristics such as self-efficacy, which in turn, would influence their teaching quality. Yet, the interplay between teacher personal psychological factors and environmental factors to explain teaching is largely ignored (see, e.g. Thoonen et al. 2011).

The current study extends this line of research by exploring the relationship between working conditions, teacher characteristics, and student perceptions of teaching in primary schools. More specifically, the study examines the mediating role of teacher characteristics in the relationship between work conditions and teaching.

4.2 Conceptual framework

4.2.1 Student perceptions of teaching quality

Students' perceptions of teaching quality can be related to their learning outcomes. For example, Fauth et al. (2014) report that student perceptions of teacher support and cognitive activation in teaching were positively related to students' development of subject-specific interest, and perceptions of classroom management were positively related to student academic achievement. Similar results are reported by Martin,

Foy, Mullis, and O'dwyer (2011). These authors explored the relationship between student perceptions of teaching and student achievement and indicate that student perceptions of the safety of the classroom environment were positively related to students' learning outcomes.

Adequate pacing, clarity of instruction, classroom management and climate, as well as close monitoring, reflect the key aspects of student perceptions of teaching (Kunter & Baumert, 2006; Wagner et al., 2013). Based on previous studies, a prominent model of student perceptions of teaching that summarizes the most important aspects of quality has been developed by Klieme et al. (2009). In a study that explores the relationship between student perceptions of teaching and teachers' learning, they distinguish three aspects of teaching quality. First, *classroom climate support,* which includes specific aspects of the teacher-student positive relationship and constructive teachers' feedback. In order to enhance a positive climate, teachers should provide extra help when needed, respect students' questions and care about students. Second, c*lassroom management,* which refers to classroom rules and procedures, coping with disruptions, and supporting smooth transitions, which are crucial for students' learning gains. Third, *cognitive activation,* which refers to the encouragement of students' cognitive engagement by helping students to apply challenge tasks, explore theoretical conceptions and integrate knowledge. Previous studies have shown that cognitive activation indeed fosters students' cognitive engagement, and students' ability to elaborate knowledge (Kunter et al., 2007).

4.2.2 Teacher psychological factors, school environment and leadership related to teaching

The framework used to guide our inquiry is based on a general model developed by Thoonen et al. (2011). This model assumes that variations of teaching practices can be explained by teacher characteristics and the organizational setting in which they work, as well as the leadership from school leaders. We have developed a model with these three general constructs and variables included in these constructs (see Figure 4.1). The presence of effects implies that the strength of working conditions, leadership from leaders, and teacher psychological factors have a significant effect on various teaching quality.

In addition, Baron and Kenny (1986) identified mediators have the potential to ex-

plain how external physical events take on internal psychological significance. It is a variable that explains the relation between the independent and the dependent variable. For teaching, an accumulating body of research indicates that teachers' self-efficacy, learning motivation, beliefs of learning have the potential to be treated as alterable variables, and demonstrate the robust path linking the relationship between school working conditions, leadership from leaders and teaching quality (Bandura & Adams, 1977; W. Liu et al., 2018; Richardson, 1996). For our study, this would mean that the relationship between working conditions, principal leadership and teaching quality has the potential to be mediated by teacher characteristics. Based on basis of these findings, we intend to treat teacher characteristics as mediators to explain how the influence of working conditions on teaching quality through teacher individual characteristics.

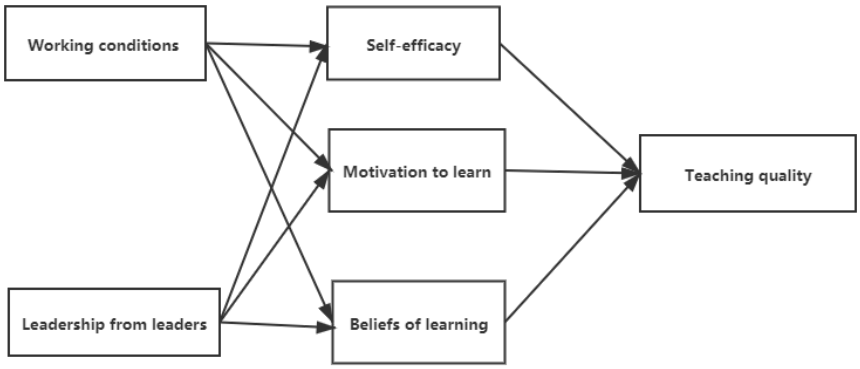


Figure 4.1

A theoretical model of the relations among teacher psychological factors, working conditions and teaching quality.

4.2.3 Teacher psychological factors related to teaching

Numerous studies into teaching have shown that several factors, such as self-efficacy (Mintzes et al., 2013), learning motivation (Lam et al., 2010), and beliefs in learning (Roehrig & Kruse, 2005) affect teaching.

Self-efficacy in teaching refers to teachers' belief in their capability to make a dif-

ference in student learning (Tschannen-Moran et al., 1998). Tschannen-Moran and Hoy (2001) indicated that the greater a teacher's self-efficacy in teaching, the more willing they were to demonstrate acceptance of new ideas and experiment with new instructions and subsequently enhancing the quality of the instruction. Other researchers, however, have come to a somewhat different conclusion, reporting that teachers with more confidence in, and satisfaction with, their teaching were less inclined to change their current teaching approach. (e.g., Supovitz et al., 2010).

Teachers' learning motivation refers to the reasons for engaging in learning activities (Deci & Ryan, 2002). Tschannen-Moran and Hoy (2001) found that the more motivated teachers are to participate in learning activities, the more creative instructional strategies they used in teaching subsequently, showing better teaching practices. Suchodoletz et al. (2018) come to a similar conclusion, indicating that teachers who are more motivated to participate in learning activities may acquire more teaching techniques, and ultimately implement new teaching strategies into their teaching practices.

Teacher beliefs about learning refer to what teachers know about learning and how they think their teaching may contribute to an understanding of the troubles and pitfalls in student learning (Bolhuis & Voeten, 2004). Some studies indicate that beliefs about learning may affect teaching (Donche & Van Petegem, 2011). For example, in a survey of 260 Dutch teachers in secondary education, Bolhuis and Voeten (2004) report that teachers with a belief in intelligence as a fixed quality were more likely to give up when confronted with difficulties when implementing new teaching strategies, whereas teachers with a belief in intelligence as a malleable quality were more concerned with developing their teaching competence and improving teaching.

4.2.4 Working conditions related to teaching

Many studies have indicated that working conditions in school can have a significant influence on teaching. Wal et al. (2020) have developed a framework to divide teachers' perceptions of working conditions into four aspects and provided a definition for each aspect:

Task autonomy, which comprises the extent to which teachers can decide on when and how to execute their work; *Collegial support,* which refers to helpful social

interactions available from colleagues on the job; *Work pressure,* which refers to challenging aspects of the job, such as workload and the pace of work; *Emotional pressure*, which concerns the extent to which teachers perceive their jobs to require emotional investment, such as emotional load, mental strain or suspense.

In a survey of 502 teachers from 32 elementary schools in the Netherlands, Thoonen et al. (2011) found that task autonomy may reinforce the extent to which teachers internalized school values as their personal goals and subsequently affect their classroom instruction. Rosenholtz (1989) reported the more emotional pressure teachers report, the more reluctant they are to improve their teaching quality. They are also more prone to teaching in a routine way, avoiding mistakes, and maintaining their present instructions.

4.2.5 Leadership related to teaching

Several leadership concepts have been posited to describe various leadership practices, such as transformational leadership (Finnigan, 2010), transactional leadership (Eyal & Roth, 2011), and instructional leadership (Liu, Hallinger, & Feng, 2016). From these, the concept of transformational leadership seems to provide the most useful insights into teachers' learning and teaching (Yang, 2014). Transformational leadership focuses on the change, and how to motivates followers to do more than they originally planned or they thought possible (Bass & Avolio, 1994). Bass (1985) identifies three aspects of transformational leadership: 1) stimulating version building, which refers to teachers' willingness to internalize organizational goals as personal goals; 2) providing individualized support, which refers to an attempt to understand and satisfy teachers' needs, and 3) supporting intellectual stimulation, which refers to encourage teachers to question their own beliefs, and eventually to enhance teachers' willingness to learn. In this study, we focus on the transformational leadership from principals and teacher educators, who are often considered to have a great influence on teachers' learning and teaching (Lunenberg, Korthagen, & Swennen, 2007). We expect that principals and teacher educators have the potential to help teachers to reflect on their own beliefs and values, and encourage them to update traditional approaches through intellectual stimulation. Previous studies also show that principals and teacher educators as transformational leaders use intellectual stimulation to enhance teachers' learning performance and help them in their professional

development (Leithwood & Jantzi, 2005; Silins, 1994).

4.2.6 This study

In sum, the present study will explore a comprehensive overview of teacher characteristics (e.g., self-efficacy, beliefs about learning, learning motivation), working conditions (e.g., work and emotional pressure, task autonomy, and collegial support), and leadership from school principals and teacher educators that are related to the student perceptions of teaching quality in a Chinese context. Besides direct effects, we also intend to explore the mediating effects of teacher characteristics on the relationship between work conditions and teaching quality. The following research questions are formulated to guide the present study:

1: How are working conditions, school leadership, and teacher psychological factors related to students' perceptions of teaching?

2: Do teacher psychological factors mediate the relationship between working conditions, principal leadership, and students' perceptions of teaching?

4.3 Method

4.3.1 Procedure and participants

This study was conducted in 12 primary schools in Shanghai. Schools in Shanghai are classified into either "key" or "ordinary" schools. The "key" schools are often given additional resources, and their teaching quality is better than in "ordinary" schools. We selected six "key" schools and six "ordinary" schools" to recruit our participants. A total of 419 teachers and 11,705 students from these 12 primary schools in Shanghai participated in this study. The mean age of teachers was 37.7 years (SD=8.5). The mean age of students was 10.3 years (SD=1.4).

Participation in the study was strictly voluntary and confidential for both teachers and students. Upon recruitment, principals authorized the study within their schools, and teachers, students and their parents were asked to sign an informed consent regarding their collaboration in the study. Ethics approval for this study was granted by the Leiden University Graduate School of Teaching (ICLON). Teachers completed a

questionnaire about their perceptions of their characteristics, working conditions, and leadership from principals and teacher educators in their offices. Their students were instructed by trained staff to finish a student questionnaire to evaluate their teachers. Then students completed a questionnaire in class about teaching quality. Each teacher indicated which teacher students were requested to evaluate, and each item was read aloud to the class to prevent reading difficulties. After that, students were given enough time to respond.

4.3.2 Data

The questionnaires used in this study are based on existing questionnaires. Items originally in English and Dutch were carefully translated and adjusted for the Chinese context, and translated back by experienced educational researchers. Then the questionnaires were piloted. The student survey has been piloted with 30 students around 10-years old. Items that cause difficulties with understanding were revised for more suitable wording. The teacher questionnaire has been piloted with 30 teachers and some items were revised for a more suitable wording.

Considering that some items are used in a Chinese context for the first time, exploratory factor analysis (EFA) with oblimin rotation was performed per variable to explore the underlying structure. For a few missing item scores, imputation with the mean score of the relevant scale was used to eliminate missing values. Items with factor loadings > 0.4 on one factor were included; all other items were excluded. The questionnaire with 127 items has been reduced to 89 items distributed over 17 scales. The Cronbach's alphas of each scale, example items and the internal reliability are shown in Appendix 5.

4.3.3 Student perceptions of teaching

To assess student perceptions of teaching in the class the questionnaire of Fauth and colleagues has been used (Fauth et al., 2014). The instrument consists of three subscales: classroom management (5 items); cognitive activation (7 items); and supportive climate (9 items), a total of 21 items. Students were asked to evaluate their teaching quality from 1= strongly disagree to 4= strongly agree. The 21 items were subjected to an EFA to determine the underlying factors. The final analysis consisted

of two components of 19 items, which explained 41.9% and 11.5% of the variance in scores, respectively. The first component includes the original scales of cognitive activation and supportive climate and is labelled 'Classroom teaching', indicating exploration of students' prior knowledge, the way of thinking, and a good relationship between teachers and students. The second component is labelled 'Classroom management' with items on classroom rules and procedures dealing with disruptions, and ensuring smooth transitions in the classroom. The Cronbach's alphas of classroom teaching and classroom management are 0.91 and 0.89, respectively.

4.3.4 Teacher conceptions of learning

Teachers' beliefs about learning are operationalized by the Teacher Conception of Learning Inventory (Bolhuis & Voeten, 2004). It included two aspects: teachers' conception of student learning (24 items) and teachers' conception of their own learning (22 items). Each aspect consists of five subscales (External versus Internal Regulation, Reproductive versus Constructive Knowledge, Individual versus Social Learning, Fixed versus Dynamic Ability and Intolerance of Uncertainty versus Tolerance of Uncertainty). Each item contained two opposite statements about the same topic, a more process-oriented statement, and a more traditional statement. Teachers were asked to indicate to what extent they agreed with the statement of learning conception. A four-point scale was used: (1) I quite agree with the statement on the left; (2) I agree somewhat more with the statement on the left than I do with the one on the right; (3) I agree somewhat more with the statement on the right than I do with the one on the left; and (4) I quite agree with the statement on the right. Reliability analysis of teachers' conception of student learning revealed that only Reproductive versus Constructive Knowledge (α=0.64), Individual versus Social Learning (α=0.59) and Fixed versus Dynamic Ability (α=0.67) were acceptable. For teachers' conception of their own learning, only Fixed versus Dynamic Ability (α=0.67) showed reliabilities for both scales. These four scales are labelled "conception of student knowledge", "conception of student teamwork" , "conception of student teamwork", "conception of student learning ability" and "conception of teacher learning ability". These factors are included in subsequent analyses.

4.3.5 Teacher self-efficacy

The Teacher Sense of Efficacy Scales (Tschannen-Moran & Hoy, 2001) were used in this study. It included instructional strategies, classroom management and student engagement three subscales. The 12 items were subjected to an exploratory principal component factor analysis with oblimin rotation to determine underlying factors. The final factor analysis consisted of two components of 11 items, which explained 55.3% and 9.6% of the variance in self-efficacy scores, respectively. The first component was labelled 'efficacy in teaching' (7 items) and included items from the original scale instructional strategies and student engagement. The second component was labelled 'efficacy in classroom management'(4 items). Teachers were asked to indicate their feeling of self-efficacy on a 9-point scale:1=none; 3=very little; 5=some influence; 7=quite a bit; 9= a great deal. The Cronbach's alphas of the two factors were 0.88 and 0.88, respectively, showing satisfying reliabilities for both scales.

4.3.6 Teacher motivation

Teachers' learning motivation has been measured with items from the Teacher Motivation Inventory (Lam et al., 2010). The inventory is based on Self-Determination Theory (SDT), implying that individuals may have multiple reasons for engaging in a certain behaviour (Deci & Ryan, 2002). It consists of four subscales: intrinsic motivation, identified regulation, introjected regulation, and external regulation, respectively. Five items per subscale were presented randomly to avoid measurement effects. Teachers responded to the items by indicating what extent each item is relevant to their motivation on a 5-point scale (1= Strongly Disagree, 2= Disagree, 3=Neither Agree nor Disagree, 4= Agree, 5= Strongly Agree).

The 20 items were subjected to an EFA to determine the underlying factors. Three components with 16 items were extracted, explaining 44%, 15% and 7.7% of the variance in motivation scores, respectively. The first component includes items from the original subscales intrinsic motivation and identified regulation. According to the perspective of self-determination theory (Deci & Ryan, 2002), the combination of intrinsic motivation and identified regulation is designated as autonomous motivation, hence the first component is labelled 'autonomous motivation'. This means that teachers engage in a learning activity for its inherent enjoyment and pleasure, or

they pursue a meaningful outcome from the activity. The example item is 'I participated because I am interested in it'. The second component has been labelled 'external regulation', which implies that the reason why a teacher engages in activities is to attain material incentives, recognition or rewards, or to avoid punishment. An example item is 'I participated because it was a duty assigned by my leaders'. The third component is labelled 'controlled introjected regulation', with items indicating the introjected regulation of teachers' motivation. This means that the reasons why teachers participate in activities are not well-internalized and their involvement is to avoid feelings of guilt or shame. An example item is 'I participated because I would feel embarrassed to explain my absence to others'. The Cronbach's alphas of autonomous motivation, controlled external regulation and introjected regulation were 0.94, 0.83 and 0.62, respectively, showing satisfying reliabilities.

4.3.7 Transformational leadership

Two aspects of leadership have been measured. First, the Principal Transformational Leadership Questionnaire (Geijsel et al., 2009) was used to measure principal leadership. It includes six items. All items are scored on a 4-point Likert-type scale with 1= 'almost never' to 4= 'almost always'. The reliability of this scale was 0.90 in terms of Cronbach's alpha.

Second, 10 items regarding teacher educator leadership were based on a survey from Supovitz et al. (2010) study, with two scales: teacher educator trust and focus on instruction. Teachers responded to the items on a 5-point scale (1= Strongly Disagree, 2= Disagree, 3=Neither Agree nor Disagree, 4= Agree, 5= Strongly Agree). The result of EFA shows only one component, teacher educator leadership, explaining 57% of the variance in scores. This scale refers to how teacher educators encourage teachers' trust and support instructional improvement, shows satisfying reliability, with a Cronbach's alpha of 0.91.

4.3.8 Working conditions

Teachers' perceptions of working conditions were assessed using the Dutch Social Psychological Work Demands questionnaire (Veldhoven & Meijman, 1994). This comprises 19 items, answered on a 4-point Likert-type scale, with 1= 'almost never'

to 4= 'almost always'. An EFA was performed in order to determine the underlying factors. Four scales with 17 items were distinguished:1) Emotional pressure – four items explaining 25.7% of the variance in scores, showing teacher emotional pressure at work; 2) Task autonomy – four items explaining 15.5% of the variance in scores, demonstrating how teachers perceived their autonomy at work; 3) Colleague support – four items explaining 10.2% of the variance in scores, indicating teachers' receipt of support from colleagues; 4) Work pressure – five items explaining 7.1% of the variance in scores, showing teachers' perceived pressure from their work. The Cronbach's alphas for emotional pressure, task autonomy, social support from colleagues and work pressure were 0.81, 0.62, 0.68 and 0.73, respectively, indicating a moderate- to high-reliability.

4.4 Analysis

Confirmatory factor analyses (CFA) were conducted to test the construct validity of the questionnaire with 'lavaan 'package version 0.6-3 (Rosseel, 2012) in R version 3.4.2. First, we conducted CFA step by step for all scales from the teacher questionnaire until the model show good fit. The fit of the model is considered acceptable when CFI≥ 0.9; TFI≥ 0.9, SRMR ≤ 0.08 and RMSEA ≤ 0.06 (Hu & Bentler, 1999). Finally, the result provides an acceptable model fit ($\chi 2$= 6914.51, (*df)=4141*, p< 0.001; RMSEA= 0.04 (0.039, 0.042); CFI= 0.90; TLI = 0.90, SRMR= 0.05.

4.5 Results

The purpose of the present study was to examine the relationship between teachers' characteristics, working conditions, leadership from principals and teacher educators and teaching quality, with a particular focus on the mediating effects. A structural equation modelling (SEM) was set up accordingly. All latent constructs were identified by fixing construct variance. We constructed separate measurement models for the items in each group of factors according to our hypothesis. Based on modification indices and standardized residuals, we stepwise added the effects of teacher personal factors and school working conditions on teaching quality. Finally, we combined these models to form Model 1 (see Figure 4.2). The result of Model 1 fits the data well: $\chi 2$=3077.07, *df*= 1415, p<0.001; RMSEA= .05; CFI=.92; TLI= .91;

SRMR= .08. Regression coefficients and correlations among the factors (r) of Model 1 are presented in Figure 4.2. It showed a completely standardized solution for the path analysis of student perceptions of teaching explained by teachers' self-efficacy, principal leadership, teacher educator leadership, task autonomy, and colleague support. For ease of exposition, only the structural part of the model is depicted. To facilitate interpretation, all the significant direct, indirect, as well as total effects on student perceptions of teaching are presented in Table 4.1.

Table 4.1

Standardized direct, indirect and total effects for explanatory variables on teaching practices

	Teaching practices					
	Classroom teaching strategy			Classroom management		
	Direct	Indirect	Total	Direct	Indirect	Total
Efficacy in classroom management				0.283		
Efficacy in classroom teaching	0.146					
Principal leadership					0.040	
Supervisor leadership		0.050				
Task autonomy					0.049	
Colleague support	0.132	0.025	0.157		0.066	
Percentage of explained variance	10.7			5.0		

Note: N=419. $\chi^2(1415)=3077.072$, $p<0.001$; CFI=0.916, RMSEA= 0.053; SRMR= 0.080. All direct effects are significant at $p< 0.05$.

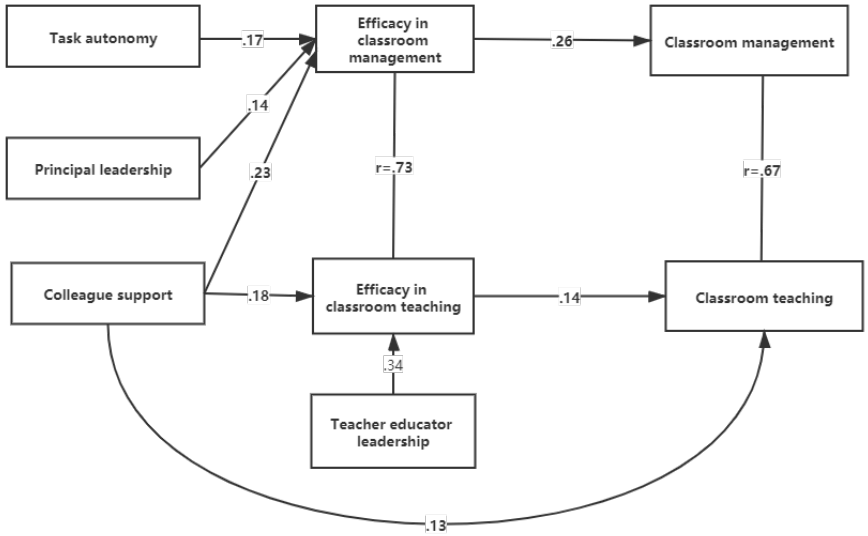


Figure 4.2

Model of student perceptions of teaching and influential factors.

4.5.1 Direct relationship between work conditions and teacher characteristics with teaching quality

Results of the final Model 1 indicates that only teachers' self-efficacy in teaching, and teachers' perceived support from colleagues directly affect student perceptions of teaching. Task autonomy, support from school leaders, as well as support from colleagues indirectly influence student perceptions of teaching.

More specifically, the results show that the student perceptions of classroom management are affected directly by self-efficacy in classroom management (β=.26, p<0.001). It indicates that the greater the teachers' self-efficacy in classroom management, the better the teaching quality in terms of the classroom management they have. The classroom teaching is more affected directly by the self-efficacy in classroom teaching (β=.14, p<0.001) and the support from their colleagues (β=.13, p=0.004). This indicates that the greater the teachers' self-efficacy in classroom teaching, and the more support their colleagues demonstrated, the better the teaching quality in terms of classroom management. However, for the other variables (e.g. teachers' educational level, teachers' belief in learning, teachers' learning motiva-

tion), we did not find any direct effects on student perceptions of teaching quality.

4.5.2 Mediating effects of teacher characteristics

We tried each indirect path in the model. In contrast to what we expected, the results showed that there is no significant indirect effect of influential factors on student perceptions of teaching quality via teachers' motivation. These findings indicate that even though they reported more motivational factors for their learning activities, their teaching practices are not more improved via their motivation according to students' perceptions.

We also expected that teachers' self-efficacy in teaching would partially mediate the effect of principal leadership, teacher educator leadership, teachers' beliefs in learning, support from colleagues, task autonomy on student perceptions of teaching. In accordance with what we expected, the result indicates that colleagues' support has an indirect effect on classroom teaching via efficacy in classroom teaching (β=.03, p=0.006). Teacher educator leadership also appears to have an indirect effect on classroom teaching via efficacy in classroom teaching (β=.05, p=0.002). This means that the more teachers perceived the support from colleagues and teacher educators, the more self-efficacy in teachers' classroom teaching which, in turn, leads to better teaching quality in terms of classroom management. For efficacy in classroom management, task autonomy seems to have an indirect effect on classroom management via efficacy in classroom management (β=.05, p<0.001). Principal leadership has an indirect effect on classroom management via efficacy in classroom management (β=.04, p=0.012). Support from colleagues appears to have an indirect effect on classroom management via efficacy in classroom management (β=.07, p=0.001). This indicates the more teachers perceived support from colleagues and school leaders, the more they felt autonomy of the task, the greater the self-efficacy classroom management, which, in turn, leads to better teaching quality in terms of classroom management. However, for the teachers' belief about learning, we did not find any indirect effects on teaching quality. It indicates that even though they are perceived more conceptions of self-directed learning, students still thought their teaching quality is not more improvement via their self-efficacy.

4.6 Discussion

In this study, we examined the relative importance of teacher psychological factors and environmental factors in explaining variation in student perceptions of teaching. We built a structural model with a sample of data 419 teachers. Our model indicated that teacher self-efficacy had a direct effect on the student perceptions of teaching. And support from colleagues had both direct and indirect effects on student perceptions of teaching. The perceived leadership from school leaders and teacher educators, task autonomy had indirect effects on the student perceptions of teaching via teachers' self-efficacy in teaching. In this section, we discuss our most important findings.

First, our findings support our assumption that teachers with a stronger belief in their own capabilities in teaching show better performance in student perceptions of teaching. Moreover, it seems that teachers' efficacy is the only variable in the model that directly relates to both subscales of student perceptions of teaching quality (classroom teaching, classroom management). This means that teachers' self-efficacy not only directly affects how they manage their classes but also influences the strategies they used in classroom teaching. Besides direct influence, teachers' self-efficacy also partially mediated the effect of perceived leadership from principal and teacher educators, teachers' beliefs regarding learning, perceived support from colleagues, task autonomy on the student perceptions of teaching. It seems that as one of the most central psychological mechanisms that affect action (Benight & Bandura, 2004), self-efficacy is a more powerful predictor for student perceptions of teaching than other influential variables in our study. The sense of self-efficacy seems to be a relevant and significant psychological factor for student perceptions of teaching in the classroom. Similarly to the research conducted by Gaertner and Brunner (2018) and Künsting, Neuber, and Lipowsky (2016), our results indicated that teachers with a strong sense of efficacy, students rated their teachers are likely to exert better teaching quality. This provides an important implication for teacher education as it demonstrates the importance of heightening teachers' self-efficacy beliefs in teaching practices.

However, according to students' perceptions, teachers' motivation for professional learning did not show the hypothesized effects on student perceptions of teaching in our structural model. These findings were unexpected in the light of previous studies

in the Western culture setting (Gan et al., 2018; Georgios Gorozidis & Papaioannou, 2014; Lam et al., 2010; Thoonen et al., 2011). One possible explanation could be explained by a cultural difference. Chinese culture places more emphasis on collectivism rather than individualism (Ho & Chiu, 1994). According to Bochner (1994), in collective societies, such as those found among Chinese teachers, the individual is more absorbed in, and attached to, the group, and people are encouraged to do what is best for the community rather than the individual. In that case, Chinese teachers may be reluctant to offer straight and negative information when they are pressed to participate in learning activities, since they are absorbed in schools.

In addition, students think that leadership from school leaders only indirectly affects teachers' management skills, but not teaching skills. One explanation for this indirect effect could be that as a managerial and political role in China, principals are required to take more responsibilities in the management of their school. As an administrator and manager, they may pay more attention to the teachers' management skills. As a consequence, school leaders may take various measures to improve teachers' confidence in their ability to manage the classroom. In a review of research into school principal leadership in mainland China, Walker and Qian (2015) also reported that the issue of classroom management was the area in which school leaders showed the greatest concern regarding new teachers' general teaching skills. School leaders may lack enough awareness to design a long-term strategy for schoolteachers' learning and development in teaching strategies as they think it is academic supervisors' responsibility.

4.7 Limitations

One limitation is that the study is conducted in Shanghai, which is one of the largest cities and the economical centre of China, it might not be similar to other Chinese cities and regions. Accordingly, the conclusion from teachers in Shanghai might not representative of teachers in general in China.

Another limitation is that we used the student survey to evaluate teaching quality. Further studies could collect data on student performance as an alternative evaluate measure, it might be helpful for the reliability of the data and conclusion.

Moreover, the percentage of explained variance seems low, it means that the model

did not include all the relevant predictors to explain an outcome variable. Further studies could include more variables in the model. For example, the demographic characteristics of teachers and students (e.g., teacher gender). Several studies in higher education contexts indicate that female instructors are consistently rated lower than their male counterparts(Fernandez & Mateo, 1997).

Finally, our study used quantitative methodologies to explore the relationship between influential factors and student perceptions of teaching. However, since teachers' instruction is a complex behaviour and various psychological and organizational factors affect student perceptions of teaching. We advise that future studies should use qualitative methodologies (e.g. in-depth face to face-to-face interview) or mix methodologies to provide a better understanding of the influence of these factors on student perceptions of teaching.

4.8 Implications

We wish to highlight several implications for theory and practice. In terms of theory, the findings affirm the importance of teachers' self-efficacy to student perceptions of teaching quality. It not only directly affects student perceptions of teaching quality, but also indirectly affects teaching quality as an important mediator. Future research should pay more attention to the possible role of teacher self-efficacy in teaching and professional development.

Considering the importance of teachers' self-efficacy in teaching practices, in practice, if teacher educators aim to improve teachers' instruction quality, they need to discuss possible strategies for individual teachers to help each teacher to develop more efficacy and resilience in dealing with future challenges in their teaching in the classroom, and make teachers feel more confident in their teaching behaviours. Principals should reinforce their leadership and give more support and freedom to increase teachers' self-efficacy − for example, through facilitating interactions and professional dialogues between teachers to try to understand their concerns and design strategies to further improve teaching practices according to their needs. For teachers themselves, teachers with rich teaching experience should help new teachers to improve their teaching skills and strategies, building an autonomy-supportive working environment to enhance individual teachers' confidence in the teaching ability.

4.9 Concluding remarks

To conclude, our study used a model of teachers' personal and environmental factors to explain the variance in the student perceptions of teaching. We found self-efficacy seemed to be the most powerful predictor for teaching practices. Support from colleagues, task autonomy, the support from principals and teacher educators also have an effect on student perceptions of teaching via teachers' self-efficacy. However, given that the school is a complex environment and various psychological and organizational factors affect student perceptions of teaching, future research should identify more organizational conditions and psychological factors that contribute to differences in classroom teaching and whether these effects persist over time.

5

TEACHERS' LEARNING MOTIVATION: RELATIONSHIP WITH FACTORS AT PERSONAL AND SCHOOL LEVELS

Abstract

Teachers' motivation to participate in professional learning is a significant factor in explaining the effectiveness of continuous professional development programmes. The present study investigated how factors at teachers' personal and school levels are related to their motivation to participate in professional learning activities. A questionnaire was completed by 472 Chinese teachers. Multivariate analysis revealed that several factors at the teacher level (teachers' prior experience with learning activities, teaching experience, self-efficacy and conceptions of learning) and the school level (work and emotional pressure, colleague support and principal leadership) were related to their motivation to participate in professional learning. These findings are discussed in the context of the professional development of Chinese teachers. Implications are generated for teacher education and continuous professional development.

This Chapter has been accepted in adapted form as: Xin, Z., Saab, N., & Admiraal, W. Teachers' learning motivation: Relationship with factors at personal and school levels. *Journal of Education for Teaching.*

5.1 Introduction

A growing body of literature confirms that teaching quality is one of the most important predictors of students' learning outcomes (e.g., Gaertner & Brunner, 2018; Scherer et al., 2016; X. Yang, Ke, Zhan, & Ren, 2014). Therefore, organising professional learning activities for in-service teachers might be an appropriate way to improve teaching quality and consequently students' learning outcomes. However, teachers' continuous learning is not self-evident. Teachers' motivation to learn is a basic condition for teacher learning and successful professional development (Shulman & Shulman, 2009). Previous studies have demonstrated that teachers' personal experiences and institutional and socio-cultural context can both influence motivation to learn in professional learning activities (Gan et al., 2018; Kwakman, 2003; W. Liu et al., 2018). For example, teachers' perceptions of freedom and autonomy of work have been found to be important predictors of teachers' motivation to learn (Gagné & Deci, 2005; Georgios Gorozidis & Papaioannou, 2014). Yet these findings might be different for teachers from a collective society like China, in which people tend to internalise the demands of people they feel attached to (Bao & Lam, 2008). Because of the cultural differences between China and Western societies (in which most studies on teachers' motivation for professional learning have been carried out), the current study aims to provide to insights into the factors that explain differences in teachers' motivation to participate in professional learning activities in China.

5.2 Conceptual framework

5.2.1 Teacher professional development in China

The quality of education depends on the quality of teachers (Hanushek & Rivkin, 2006). Various professional development (PD) programmes for teachers' development have therefore been set up to improve and maintain a high standard of teaching. In China, PD programmes are generally offered by the Ministry of Education of the People's Republic of China (Ping, Schellings, Beijaard, & Ye, 2020). However, many educational professionals have acknowledged that the current PD programmes do not fit teachers' learning preferences or their specific concerns, and are therefore misaligned with teachers' problems in practice, their learning preferences or their specific concerns (Yan, 2015; Yuhua & Jiacheng, 2013; X. Zhang & Wong, 2018).

As a result, teachers may feel less motivated to participate in such programmes. To better stimulate teachers' motivation for learning and to improve their learning performance, new PD programmes need to be designed. In this study, we focus on a specific educational programme, the New Basic Education (NBE), which is designed as a long-term school-based training programme to continuously help teachers learn and refine pedagogical strategies. Academic supervisors from three types of universities (Normal universities under the Ministry of Education of the People's Republic of China, Comprehensive research universities, and Provincial normal universities) go to schools weekly to organise seminars for teachers to disseminate their own professional experiences and beliefs. They also visit class each week to observe teaching and provide feedback. In addition, they organise monthly workshops to help teachers to implement theories in practices *(see Introduction Table 1.1)*.

Although NBE is regarded as an effective PD, it is not readily accepted by all teachers in China (Bu & Han, 2019), because the new practices addressed in the programme bear little resemblance to either their current teaching approaches or the way they have learned from programmes offered by the government. Consequently, some teachers may be reluctant to participate in professional learning activities.

5.2.2 Teachers' learning motivation

Motivation to participate in professional learning can be approached as a multidimensional construct, implying that individuals may have multiple reasons for engaging in a certain behaviour (Deci & Ryan, 2002). In the case of participating in learning activities, a teacher may work with teaching experts to improve their teaching quality with pleasure and enjoyment derived from the partnership. This represents an example of intrinsic motivation, which is deemed the most self-determined type of motivation. In contrast, extrinsic motivation refers to behaviours that are exhibited in order to attain material incentives, recognition or rewards, or to avoid punishment. It can be divided into: a) external regulation, where the reasons for participating in professional learning are entirely external from the self; b) introjected regulation, where the reasons for getting involved in professional learning are not fully internalised and teachers merely want to avoid feelings of guilt or shame; and c) identified regulation, where the reason for doing an activity is to pursue fully internalised goals, which is considered a highly self-determined form of extrinsic motivation (Georgios

Gorozidis & Papaioannou, 2014). According to the Self-Determination Theory (SDT) of Deci and Ryan (2000), intrinsic motivation and identified regulation can be understood as autonomous motivation. External regulation and introjected regulation are conceptualised as controlled motivation. Research on teachers' motivation to participate in professional learning activities has systematically revealed that autonomous motivation is strongly related to positive teacher learning outcomes, whereas controlled motivation has been closely associated with negative outcomes (Blais et al., 1993; Deci et al., 2001; Gagné et al., 2010).

5.2.3 Factors related to teachers' learning motivation

Many studies have indicated that teachers' personal and psychological factors and their perceptions of workplace conditions in schools can potentially affect their motivation to participate in professional learning activities (Geijsel et al., 2009; Thoonen et al., 2011). A motivation model to describe the impact of factors on teachers' motivation to participate in learning activities has been developed by McMillan, McConnell, and O'Sullivan (2016). This model provides a comprehensive view of stimulating and inhibiting factors of teachers' motivation for continuous professional development at three levels: personal, school-related and system-wide. In principle, factors at these three levels can either enhance or inhibit both autonomous and controlled forms of teachers' motivation to participate in learning activities.

At the personal level, *intrinsic factors* are included, which mean that teachers would attend a PD programme because of their personal factors. Teachers would express a preference to pursue professional learning activities that they valued for their own personal reasons, and in response to their own personal and/or professional needs. Factors at the personal level are generally considered to be the chief catalysts of intrinsically motivating teachers to participate in PD programmes.

At the school level, *contingent factors* are included, which refer to the workplace conditions that can either support or inhibit teachers' motivation for learning. They include interpersonal relations and school policy. Interpersonal relations refer to the relationship between teachers and their colleagues and school leaders. School policy refers to general support in school. It is assumed that teachers are more likely to engage in learning activities when they perceive a supportive school culture. Factors at the school level can be positively linked to both autonomous and controlled forms of

teacher motivation to participate in learning activities.

At the system level, *tangential factors* are included when the professional learning activities are mandatory, and teachers have no choice whether or not to be involved in the PD programmes. Tangential factors refer to a compulsory effort to force teachers to engage in the professional learning activity, including threats of being punished, scrutinised and evaluated. The difference between tangential factors and contingent factors is that tangential factors are more focused on the system of PD, whereas contingent factors pay more attention to aspects related to the school environment. Generally, tangential factors relate positively to controlled forms of teacher motivation to participate in learning activities.

In this study, we have included factors at the personal and the school level, but not at the system level, as our study is within one particular system, which is described as the professional development programme. Moreover, teachers' participation in professional learning activities is voluntary rather than mandatory, which means that there is no effort to force teachers to participate in professional learning activities.

5.2.4 Factors at the personal level

Based on the model of McMillan et al. (2016), four variables were labelled as factors at the personal level: teachers' self-efficacy, conceptions of learning, prior learning experience and teaching experience. Teachers' self-efficacy refers to their beliefs in their ability to make a difference in student learning and to get through even to students who are difficult or unmotivated (Tschannen-Moran et al., 1998). Prior learning experience refers to teachers' prior successful experience in professional learning activities.

It has been shown that these four variables exercise a significant influence on teachers' motivation to participate in learning activities. In a study on teachers' participation in professional learning, Geijsel, Sleegers, Stoel, and Krüger (2009) show that teachers with a strong belief in their own capabilities were more involved in learning activities and showed more enthusiasm and passion for learning, compared to teachers with low self-efficacy. With regard to teachers' conceptions of learning, Bolhuis and Voeten (2004) report that teachers with a belief in intelligence as a fixed quality were more likely to give up when confronted with difficulties when imple-

menting new teaching strategies. Conversely, teachers with a belief in intelligence as a malleable quality were more concerned with developing their teaching competence and persistence, despite difficulties, and were more motivated to participate in PD programmes. Finally, Hildebrandt and Eom (2011) find that inexperienced teachers showed higher needs for achievement and growth compared to experienced teachers. To pursue greater achievements, inexperienced teachers were more motivated to participate in PD programmes.

5.2.5 Factors at the school level

In the model of McMillan et al. (2016), two categories of contingent factors were distinguished: interpersonal relations and school policy. In the current study, five variables were labelled as factors at the school level: collegial support, principal leadership, work pressure, emotional pressure and task autonomy. Collegial support refers to helpful social interactions with colleagues in school (Kwakman, 2003). Principal leadership refers to vision building through initiating and identifying a vision for the school's future, providing individual support and providing intellectual stimulation (Silins, 1994). Collegial support and principal leadership are understood to be part of interpersonal relations.

Work pressure refers to challenging aspects of the job such as workload and the pace of work (Veldhoven & Meijman, 1994). Emotional pressure concerns the extent to which teachers perceive their jobs as requiring emotional investment (Veldhoven & Meijman, 1994). We also distinguish task autonomy, which refers to joint decision-making or shared influence in decision-making processes by teachers in school (Veldhoven & Meijman, 1994). It is assumed that how teachers perceive pressure and autonomy depends on the school policy for building an autonomy-supportive work environment, so we label work pressure, emotional pressure, and task autonomy as the school policy variables.

Ishler, Johnson, and Johnson (1998) demonstrate that teachers' motivation for professional learning was closely related to both the support they received from their colleagues and the leadership they received from their principal. Thoonen et al. (2011) show that task autonomy reinforced the extent to which teachers internalised school values as their personal goals, and subsequently affected their motivation to engage in continuous professional development. In a study on teachers' workplaces, Rosen-

holtz (1989) indicates that work pressure is generally regarded as a job challenge. He measures teachers' work pressure, and reports that the more challenges teachers reported in their workplace conditions, the more prone they are to maintain their present methods of instructions and to avoid mistakes, and the more reluctant they were to participate in continuous professional development.

The present study provides a comprehensive overview of factors at the personal level (i.e., prior learning experience, teaching experience, self-efficacy and conceptions of learning) and factors at the school level (i.e., principal leadership, task autonomy, collegial support, work pressure and emotional pressure) that are related to teachers' motivation for professional learning in the Chinese context. The following research question is addressed:

'How are factors at the personal and school levels related to teachers' motivation to participate in professional learning?'

5.3 Method

5.3.1 Procedure and participants

In this study, 514 teachers from 13 primary and middle schools in Shanghai (China) participated in this study. The first author visited each school and sent the questionnaire directly to teachers. They were given enough time (30 minutes) to complete the questionnaire individually at their offices. In total, 42 teachers did not fully complete the questionnaire. The questionnaires of these teachers were removed, resulting in a sample of 472 teachers who were included in the analysis. For a few missing items, imputation of the sample mean was used to reduce the number of missing values.

Participation in the study is strictly voluntary, and teachers completed the questionnaire anonymously. Ethics approval for this study was granted by ICLON. Upon recruitment, school leaders authorised the study within schools, and teachers were asked to sign an informed consent regarding their participation in the study. Teachers' ages ranged from 22 to 64 years, and they taught a wide array of subjects. Participants' information is displayed in Table 5.1. These demographic variables were also included in the model to explore how they influence teachers' motivation to learn.

Table 5.1

Participant information (N=472)

	Participants	N
Gender	Female	425
	Male	47
Subject	Chinese	162
	English	113
	Mathematics	102
	Art	23
	Music	20
	Others	52
Teaching experience	0–3 years	55
	4–6 years	70
	7–18 years	148
	19–30 years	169
	31-plus years	29
Educational background	Secondary vocational School diploma	2
	Senior college degree	34
	Bachelor's degree	359
	Master's degree	74
Prior educational reform experience	Yes	229
	No	242
Time involved in NBE	0	9
	1–3 months	22
	4–6 months	14
	7–11 months	14
	12–23 months	39
	24–35 months	44
	36–47 months	65
	48–59 months	33
	60–71 months	34
	72 -plus months	197

5.3.2 Teacher motivation

The questionnaire comprised different components from questionnaires used in studies conducted in Western countries. The questionnaire was translated into Chinese, with translation and back-translation of the instrument. Upon completion of the translation and back-translation procedure, minor discrepancies were discussed thoroughly, and subsequently revised. Next, the questionnaire was tested in a pilot study with 30 teachers from primary schools in Shanghai. This pilot study resulted in minor changes designed to provide more suitable wording.

Teachers' motivation to participate in professional training was assessed using the Teacher Motivation Inventory (Lam et al., 2010). The instrument consisted of four subscales (external regulation, introjected regulation, identified regulation and intrinsic motivation) with five items per scale, constituting a total of 20 items. The items were presented randomly. Teachers were asked to indicate their feelings of motivation on a five-point scale (1=Strongly Disagree, 2=Disagree, 3=Neither Agree nor Disagree, 4=Agree, 5=Strongly Agree). The 20 motivation items were subjected to an exploratory principal component factor analysis to determine the underlying factors. Three components out of 16 items were extracted, explaining 44%, 15% and 7.7% of the variance in motivation scores, respectively. The first component included intrinsic motivation and identified regulation. According to the perspective of self-determination theory (Deci & Ryan, 2002), the combination of intrinsic motivation and identified regulation is designated as autonomous motivation, hence the first component was labelled 'autonomous motivation'. This means that teachers engage in a learning activity for its inherent enjoyment and pleasure, or they pursue a meaningful outcome from the activity. The second component was labelled 'external regulation', which implies that the reason why the teacher engages in activities is to attain material incentives, recognition or rewards, or to avoid punishment. The third component was labelled 'introjected regulation', with items indicating the introjected regulation of teachers' motivation. This means that the reasons why teachers participate in activities are not well-internalised, and their involvement is to avoid feelings of guilt or shame. The Cronbach's alphas of autonomous motivation, external regulation and introjected regulation were 0.94, 0.83 and 0.62, respectively, showing satisfactory reliabilities.

5.3.3 Teachers' teaching experience

We divided teaching experience into five broad categories (Huberman, 1989), namely Career Entry Stage (0–3 years of teaching experience), Stabilisation Stage (4–6 years of teaching experience), Experimentation-Diversification Stage (7–18 years of teaching experience), Serenity Stage (19–30 years of teaching experience) and Disengagement Stage (31 or more years of teaching experience).

5.3.4 Self-efficacy

Teachers' self-efficacy was assessed using the Teachers' Sense of Efficacy Scale (TSES, 12 items) developed by Tschannen-Moran and Hoy (2001), which included three subscales: 1) instructional strategies, 2) classroom management and 3) student engagement. The 12 items were subjected to an exploratory principal component factor analysis with oblimin rotation to determine the underlying factors. The final factor analysis consisted of two components of 11 items, which explained 55.3% and 9.6% of the variance in self-efficacy scores, respectively. The first component was labelled 'efficacy in teaching' (7 items) and comprised items from the original scale of instructional strategies and student engagement. The second component was labelled 'efficacy in classroom management' (4 items) and comprised items from the original scale of classroom management. The Cronbach's alphas of the two factors were 0 .88 and 0.88, respectively, showing satisfying reliabilities for both scales.

5.3.5 Teacher conceptions of learning

In order to capture teacher conceptions' of student learning as well as of their own learning, 46 items were derived from the teacher conception questionnaire, including five subscales: External versus Internal Regulation, Reproductive versus Constructive Knowledge, Individual versus Social Learning, Fixed versus Dynamic Ability and Intolerance of Uncertainty versus Tolerance of Uncertainty (Bolhuis & Voeten, 2004). Teachers stated the extent to which they agreed with each learning conception to themselves and to their students. A four-point scale was used. Reliability analysis of teacher conception of student learning revealed that only Reproductive versus Constructive Knowledge (α=0.64), Individual versus Social Learning (α=0.59) and Fixed versus Dynamic Ability (α=0.67) were acceptable. For teachers' conceptions

of their own learning, only Fixed versus Dynamic Ability (α=0.67) showed reliabilities for both scales. These four scales were labelled 'conception of student knowledge', 'conception of student teamwork', 'conception of student ability' and 'conception of their own ability', and are included in subsequent analyses.

5.3.6 Principal leadership

In this study, principal leadership was measured by six items from a questionnaire on the transformational leadership (Geijsel et al., 2009). The Cronbach's alpha for principal leadership was 0.91, indicating satisfactory reliability.

5.3.7 Working conditions

Based on Dutch Social Psychological Work Demands questionnaire (Veldhoven & Meijman, 1994), working conditions include task autonomy, support from colleagues, work and emotional pressure. It comprised 19 items, answered on a 4-point Likert type scale with 1= "almost never" to 4= "almost always". Cronbach's alphas for task autonomy, social support from colleagues, work and emotional pressure were 0.62, 0.68, 0.73, 0.81 respectively, indicating satisfactory reliability. The descriptive statistics for the dependent and independent variables were included in Table 5.2.

Table 5.2

Descriptive statistics for the dependent and independent variables

	Number of items	Mean	SD	α	N
Teacher motivation					
Autonomous motivation	10	3.88	0.63	0.94	472
External regulation	3	3.52	0.89	0.84	472
Introjected regulation	3	2.94	0.76	0.62	472
Factors at personal level					
Efficacy in teaching	7	6.35	1.08	0.88	472
Efficacy in classroom management	4	6.91	1.29	0.88	472
Conception of student knowledge	4	3.48	0.54	0.64	472
Conception of student teamwork learning	4	3.26	0.54	0.59	472
Conception of student ability	5	3.07	0.55	0.67	472
Conception of teacher ability	4	3.32	0.55	0.67	472
Factors at school level					
Principal leadership	6	3.07	0.65	0.91	472
Emotional pressure	4	2.26	0.64	0.81	472
Work pressure	3	3.24	0.62	0.73	472
Colleague support	4	2.80	0.52	0.68	472
Task autonomy	4	2.21	0.58	0.62	472

5.4 Analysis

As data are nested (teachers within the school), multilevel variance components analyses were carried out for each motivation scale. For both scales, we found no significant variance at the school level (with $\alpha = 0.05$). This means that the analyses were performed at the teacher level only. Multivariate analyses of variance (MANOVA) were carried out using SPSS (version 22), with factors at the personal and school levels as independent variables and the three motivation scales as dependent variables. These analyses were first performed for each cluster of teacher personal level and school level separately. In the final analysis, only variables with significant

effects on the previous steps were included. The results of the final analyses are presented in the results section.

5.5 Results

In Table 5.3, the variables are included that appear to be significantly related to at least one of the motivational variables. In this study, we reported the F value, p value and proportion explained variance ($\eta 2$) of the model, which are the most commonly reported for MANOVA (Keselman et al., 1998) .

Table 5.3

The results of the multivariate analyses of significant teacher characteristics, personal and perceived working conditions and motivation

	Total motivation	Autonomous motivation	External regulation	Introjected regulation
Factors at personal level				
Prior experience	Wilks'λ(3,458)=0.982; P=0.040; η^2=0.018	F(1,460)=4.039; P=0.045; η^2=0.009		
Teaching experience	Wilks'λ(3,458)=0.972; P=0.005; η^2=0.028	F(1,460)=7.280; P=0.007; η^2=0.016		
Efficacy in teaching	Wilks'λ(3,458)=0.964; P=0.001; η^2=0.036	F(1,460)=11.367; P=0.001; η^2=0.024		F(1,460)=7.387; P=0.007; η^2=0.016
Conception of students' ability	Wilks'λ(3,458)=0.965; P=0.001; η^2=0.035	F(1,460)=11.192; P=0.001; η^2=0.024	F(1,460)=8.540; P=0.004; η^2=0.018	
Conception of their own ability	Wilks'λ(3,458)=0.979; P=0.020; η^2=0.021	F(1,460)=9.707; P=0.002; η^2=0.021		
Factors at school level				
Emotional pressure	Wilks'λ(3,458)=0.969; P=0.002; η^2=0.031	F(1,460)=4.917; P=0.027; η^2=0.011	F(1,460)=9.658; P=0.002; η^2=0.021	
Principal leadership	Wilks'λ(3,458)=0.878; P<0.001; η^2=0.122	F(1,460)=58.493; P<0.001; η^2=0.113	F(1,460)=12.384; P<0.001; η^2=0.026	

5.5.1 Factors at the personal level

A significant relationship is found between prior experience and autonomous motivation (F(1,460)=4.039; p=0.045; η^2=0.009). Teachers with prior experience (M=3.95, SD=0.625) are more autonomously motivated to participate in a university-school

partnership than teachers with no prior experience (M=3.81, SD=0.642). We also find that teaching experience is significantly associated with teachers' autonomous motivation (F(1,460)=7.280; p=0.007; η^2=0.016), implying that the more teaching experience teachers have, the less autonomously motivated they are to participate in professional learning activities.

We also find a significant positive relationship between teacher efficacy in teaching and teacher autonomous motivation (F(1,460)=11.367; p=0.001; η2=0.024). This indicates that the greater teachers' self-efficacy in teaching, the more autonomously motivated they are to participate in professional learning activities. We also find a weak positive relationship with introjected regulation (F(1,460)=7.387; p=0.007; η^2=0.016), indicating that the more self-efficacy teachers reported, the higher the introjected regulation for professional learning they reported. Another significant relationship is found between teachers' conceptions of learning and teacher motivation. In particular, conception of students' ability demonstrates a significant positive relationship with teacher autonomous motivation (F(1,460)=11.192; p=0.001; η^2=0.024) and a negative relationship with external regulation (F(1,460)=8.540; p=0.004; η^2=0.018). These results mean that teachers who conceived of learning as dynamic are more autonomously motivated and perceived less external regulation in their motivation to participate in professional learning.

5.5.2 Factors at the school level

Emotional pressure appears to have a significant negative relationship with autonomous motivation (F(1,460)=4.917; p=0.027; η^2=0.011) and a significant positive relationship with external regulation (F(1,460)=9.658; p=0.002; η^2=0.021). This means that the more emotional pressure teachers reported, the less autonomously and the more externally motivated they are to participate in professional learning. Principal leadership also appears to demonstrate a significant positive relationship with autonomous motivation (F(1,460)=58.493; p<.001; η^2=0.113) and a negative relationship with external regulation (F(1,460)=12.384; p<0.001; η^2=0.026), indicating a significant impact of principal leadership on teachers' motivation to participate in the university-school partnership. Therefore, the more leadership the principal demonstrated, the more teachers are autonomously motivated to participate in professional learning.

5.6 Discussion and conclusion

5.6.1 Factors at the personal level and motivation

As regards teachers' experience, we find that the effects of teachers' teaching experience and of prior learning experience on teachers' motivation are opposed. Teachers with more teaching experience are less in favour of interaction and of learning with supervisors from universities about their subject domain. However, if a teacher has a prior successful learning experience, he or she may still maintain a high level of autonomous motivation to learn. Richter (2013) finds early-career teachers to be more 'eager' for PD, and that as teaching experience increases, the levels of participation decreases. However, based on our results, if experienced teachers are provided with a successful learning experience when they first participate in a PD programme, they still have the potential to be stimulated to learn. Considering that increase of teaching experience is inevitable, our result emphasises the importance of the teachers' learning experience for their motivation to participate in follow-up activities.

Teachers' self-efficacy in teaching is positively related to their autonomous motivation for learning. This means that the higher teachers' confidence in teaching, the more motivated they are to participate in professional learning; however, a positive relationship between teachers' self-efficacy and introjected regulation is also found. This means that teachers with more self-efficacy participate in PD more to avoid feelings of guilt or maintain self-worth. Apparently, self-efficacious teachers are more motivated for professional learning than other teachers, no matter the source of their motivation. However, our results further reveal that the reasons why high efficacy teachers participate in activities may not have been well internalised. This indicates that they may implement this PD and actions without fully accepting them as their own. According to SDT theory (Deci & Ryan, 1985), such behaviour is perceived as external and has been closely associated with negative learning outcomes, such as less enthusiasm and persistence for learning. Our results show the crucial role of teachers' introjected regulation in teacher learning, which is less firmly established in previous studies (Guo, Justice, Sawyer, & Tompkins, 2011; Suchodoletz et al., 2018).

In line with previous research (Bolhuis & Voeten, 2004), our study confirmes the important influence that teachers' conceptions about learning ability exert on their

motivation for professional learning. Our findings indicate that teachers' conceptions of students' learning ability have a positive relationship with teachers' autonomous motivation and a negative relationship with external regulation. However, teachers' conception of their own ability is only found to be positively related to autonomous motivation. Given that beliefs will directly affect how teachers utilise their pedagogical knowledge in the classroom and shape their reactions to professional learning (Roehrig & Kruse, 2005), these findings may prove valuable to policymakers seeking to motivate teachers to participate in professional learning.

5.6.2 Factors at the school level and motivation

First, principal leadership appears to be related not only to teachers' autonomous motivation (positively), but also to external regulation (negatively). This means that principals with more leadership are more likely to encourage teachers to learn autonomously, and to avoid inducing teachers to participate in this activity because of material incentives or rewards or to avoid punishment. Research on SDT (Deci & Ryan, 1985) has indicated that autonomous motivation could significantly enhance the effectiveness of teachers' learning experiences in PD programmes. This finding therefore confirms the important role of principal leadership in teachers' motivation for professional learning. Actually, compared with principals in Western schools, Chinese principals might have more influence on schoolteachers. Dou, Devos, and Valcke (2017), in their study on Chinese principal leadership, indicate that Chinese principals' leadership tremendously influences every aspect of school teaching through the school climate. The positive relationship with teachers' autonomous motivation for learning found in the current study suggests a supportive role of the school principal instead of a coercive one, as suggested by the negative relationship with controlled motivation.

Second, emotional pressure appears to have a negative relationship with teachers' autonomous motivation for learning and a positive one with external regulation. This means that the more teachers perceived emotional pressure, the less autonomously motivated they are to participate in professional learning and the more their motivation is felt as externally regulated. Previous studies on teacher stress indicate that teachers under great pressure are more vulnerable to burnout (Herman et al., 2020). Our study indicates that stressed teachers may continue to participate in PD,

but that their motivation may become more external, and the influence of PD on teaching also become less effective. Although work pressure and emotional pressure are closely related, we do not find any significant and negative relationship between work pressure and teacher motivation. This contradicts previous research that finds a significant relationship between work pressure and teachers' motivation to participate in professional learning (Kwakman, 2003). Apparently, for Chinese school teachers, emotional pressure might be a more salient factor than work pressure in determining the motivation for professional learning. This finding of the salience of emotional pressure on teachers' motivation for learning complements previous studies, since most studies focus on teachers' work pressure and professional learning rather than on emotional pressure (Wal et al., 2020).

5.6.3 Insignificant factors for Chinese teachers' motivation

Our results also indicate that colleague support and task autonomy were unrelated to Chinese teachers' motivation to participate in professional learning. This finding contradicts the findings of some studies in the Western context claiming that help from colleagues and task autonomy have a significant positive influence on teachers' motivation to participate in professional learning (Kwakman, 2003; Thoonen et al., 2011). Supovitz et al. (2010) also identify a considerable positive effect of support from colleagues on teachers' motivation to participate in professional learning. This discrepancy may be attributed to a cultural difference, as compared to their counterparts from Western countries, teachers from China are more deeply influenced by Eastern culture. Indeed, Kennedy (2002) has indicated that Chinese teachers' apparent reluctance to ask for help when they encounter problems with teaching is due to a fear of 'losing face' (mien-tzu – having status in front of others). People's awareness of 'face' is extremely important, as Chinese teachers are high-context collectivists, and it is considered selfish and shameful to cause someone to 'lose face' in Chinese culture, in Western culture, on the other hand, loss of face is not as crucial to one's self-achievement, as people are inclined to fight for their own needs rather than feel concerned about social acceptance (Nhung, 2014).

Differences between Chinese and Western culture might also explain the lack of a significant relationship between task autonomy and teachers' motivation for learning. According to Bochner (1994), in collective societies such as China, the individual is

more absorbed into and attached to the group, and people are encouraged to do what is best for the community rather than for the individual. A collectivistic culture is not only related to teachers' behaviour, but also forms the cornerstone of school policies. This might mean that schools do not encourage task autonomy among teachers, and Chinese teachers may be obligated to sacrifice their freedom in performing a task for the greater performance of the school.

5.7 Limitations

Three limitations should be carefully considered. Only schools from Shanghai have been invited to participate in our study. Shanghai is one of the largest cities and the economical centre of China, and teachers from Shanghai are generally well-trained and have many opportunities to participate in professional learning activities. Teachers from rural areas are generally less well-trained and often lack sufficient opportunities to learn new teaching strategies. This gap in learning opportunities between teachers from rural areas and those from large cities may prevent us from generalising our findings to other regions in China.

Second, because of the Chinese context, we should be careful about generalising to the teacher development situation in Western countries. Yet we assume that our conclusions could be generalised to other Asian countries with similar cultures of teaching and learning, such as Japan and Korea. In addition, the findings of the current study also generate hypotheses about factors related to teachers' motivation to participate in professional learning activities that can be tested in contexts outside of East Asia.

Third, the current study is based on quantitative questionnaire data only. Given that the school is a complex environment and various psychological and organisational factors affect teachers' motivation to participate in professional learning, future studies could use qualitative methodologies (e.g., in-depth face-to-face interviews) as well to develop a better understanding of these factors' influence on teachers' motivation for professional learning. In addition, moderator analyses could also be applied to examine how various groups of teachers (clustered on the basis of their characteristics, such as self-efficacy and teaching experience) differ in the relationship between school level factors and motivation to participate in learning activities.

5.8 Conclusion

The current study has presented a comprehensive account of factors at the personal and school levels that are significantly related to teachers' motivation to participate in professional learning activities. Teachers' prior experience, teaching experience, self-efficacy, beliefs about learning, emotional pressure and principal leadership were all related to teachers' motivation for professional learning. Two non-significant relationships with colleague support and task autonomy were attributed to the characteristics of the Chinese educational context. Based on the findings several implications can be formulated to help stimulate teachers' motivation to learn.

First, our results indicate that, compared to inexperienced teachers, experienced teachers are less motivated to participate in learning activities. This might mean that PD activities should be designed to be more challenging for experienced teachers. For example, professional learning activities for more experienced teachers could be focused on using innovative pedagogies in the classroom, and providing guidance and workshops for beginning teachers. In addition, to stimulate teachers' motivation to learn, more attention should probably be paid to teachers' prior learning experiences. Professional learning activities could be carefully designed on the basis of teachers' needs in order to create individual learning pathways, which might be more motivating and more effective than the one-size-fits-all approach.

The second implication of our findings relates to the importance of the level of self-efficacy for teachers' motivation to learn. In order to be effective for teachers with low levels of self-efficacy, PD programmes could be designed with scaffolds that are reduced over time. This could reduce feelings of pressure and enhance all teachers' confidence in their ability to change their teaching and adapt to PD programmes.

A third implication of our findings relates to the important role played by principal leadership in teachers' motivation to participate in professional learning. School principals can reinforce teachers' commitment to the school and the teaching profession in general by identifying a school vision of teaching and learning, which also strengthens teachers' attitudes towards their own learning. As a result, teachers may feel more willing to internalise organisational goals as their personal goals, which in turn might increase their autonomous motivation to participate in learning activities.

6

TEACHER AUTONOMOUS MOTIVATION FOR CONTINUOUS PROFESSIONAL DEVELOPMENT: THE RELATIONSHIP WITH PERCEIVED WORKPLACE CONDITIONS

Abstract

The school context has the potential to hinder or stimulate teachers' motivation to attend Continuous Professional Development (CPD). The present study investigated the relationship between workplace conditions in schools and teachers' autonomous motivation to participate in New Basic Education (NBE). A questionnaire was completed by 472 teachers in 12 schools in the Shanghai region in China. The results show that four school condition variables are related to teachers' autonomous motivation for NBE. The more support teachers report to receive from their school principals and the more work pressure they experience, the more they are motivated for NBE. In contrast, the more teachers report being supported by their colleagues and the more emotional pressure they receive, the less they are motivated for NBE. In addition, two school condition variables also moderate the relationship between teachers' personal factors and their motivation for NBE. First, the negative relationship of support from colleagues with motivation is stronger for experienced teachers and weaker or absent for beginning teachers. Second, high levels of perceived task autonomy in school is positively related to motivation for NBE for teachers with low levels of self-efficacy and not or even negatively for teachers with high levels of self-efficacy. These findings can have implications for school leaders and policymakers to implement strategies that foster teacher motivation to attend NBE.

This Chapter has been submitted for publication in an adapted form as Xin, Z., Saab, N., & Admiraal, W (minor revision). Teacher autonomous motivation for continuous professional development: the relationship with perceived workplace conditions.

6.1 Introduction

In order to improve their quality of instruction, school teachers today are required to continuously adapt their knowledge and skills to deal with expanding knowledge, new responsibilities, and growing social expectations (OECD, 2005). However, teachers' continuous learning is not self-evident. Autonomous motivation to participate in Continuous Professional Development (CPD) is a basic condition for teacher learning and successful professional development (Shulman & Shulman, 2009). Previous studies have demonstrated that teachers' characteristics, such as teaching experience, self-efficacy, and beliefs about learning are crucial for their motivation to participate in CPD (e.g., Gan et al., 2018; Kwakman, 2003; W. Liu et al., 2018). In addition, some multilevel studies also indicated that workplace conditions in schools, such as teachers' interactions with colleagues, and the role of principals potentially affect teachers' learning motivation (Loukas & Robinson, 2004; Suchodoletz et al., 2018; Thoonen et al., 2011). It means that the relationship between teachers' characteristics and their learning motivation may vary across different schools, related to workplace conditions. Yet, to our knowledge, there is no empirical research addressing these direct and indirect effects on teachers' learning motivation. This study intends to fill this gap by building a multilevel model to investigate the relationship between workplace conditions in school and teachers' learning motivation, and the possible cross-level moderating effects of workplace conditions on the relationship between teachers' characteristics and their learning motivation. Answering this question will contribute to a better understanding of how to motivate teachers to participate in CPD.

6.2 Teacher motivation to participate in Continuous Professional Development

Motivation to participate in CPD has been approached as a multidimensional construct, implying that individuals may have multiple reasons for engaging in a certain behaviour (Deci & Ryan, 2002). In the case of participating in learning activities, a teacher, for example, may work with teaching experts to improve his or her teaching quality motivated by the pleasure and enjoyment derived from this partnership. This represents an example of *intrinsic motivation*, which is considered the most self-determined type of motivation. Besides intrinsic motivation, a teacher may also partic-

ipate in professional learning activities with the aim to pursue a meaningful outcome from these activities. This is called *identified regulation*. According to the self-determination theory (Deci & Ryan, 2002), intrinsic motivation and identified regulation can be understood as *autonomous motivation*. In contrast, teachers may also participate in professional learning activities when they merely want to avoid feelings of guilt or shame. This is called *introjected regulation*, because the reason for getting in professional learning is not fully internalized. Finally, teachers' participation can be based on the motivation to earn rewards, which refers to the reasons for participating in professional learning that are entirely external from the self. This is called *external regulation*. External regulation and introjected regulation are conceptualised as *controlled motivation*.

Research on teachers' motivation to participate in CPD has systematically revealed that autonomous motivation is positively related to teacher learning outcomes, whereas controlled motivation has been negatively associated with outcomes or shows zero effects (Blais et al., 1993; Deci et al., 2001; Gagné et al., 2010).

6.3 Workplace conditions and teachers' motivation to participate in Continuous Professional Development

Teacher characteristics, such as teachers' teaching experience (Hildebrandt & Eom, 2011), and teacher psychological factors, such as self-efficacy in teaching (Kwakman, 2003), and their conceptions of teaching and learning (Bolhuis & Voeten, 2004) can influence teachers' motivation to participate in CPD. Yet this relationship is not a straightforward one; it might be influenced by teachers' workplace conditions. These workplace conditions can influence teachers' motivation to participate in professional development activities either directly or indirectly through moderating the relationship between teacher characteristics and motivation (Fernet, Senécal, Guay, Marsh, & Dowson, 2008; Lam et al., 2010). Below we will first discuss the potential workplace conditions that can influence teachers' motivation for professional development and then go into the literature on this relationship itself.

6.3.1 Workplace conditions in school

Based on the study of the psychosocial workload of teaching (Veldhoven & Mei-

jman, 1994), Wal et al. (2020) divided teachers' perceptions of workplace conditions into four aspects and provided a definition for each aspect:

- *Task autonomy,* which comprises the extent to which teachers can decide on when and how to execute their work;
- *Colleague support,* which refers to helpful social interactions available from colleagues on the job;
- *Work pressure,* which refers to challenging aspects of the job, such as work load and the pace of work;
- *Emotional pressure,* which concerns the extent to which teachers perceive their jobs to require emotional investment, such as emotional load, mental strain or suspense;

In addition, several studies suggest that as an important workplace condition in school, principal leadership exercises a significant influence on teacher professional development (Dou et al., 2017; Finnigan, 2010). Chinese school principals in particular, who often have managerial and political roles, are expected to play an important role in teachers' development (Xin & Fred, 2014). According to the work of Bass (1985), leadership can be divided into two dimensions: *transactional leadership and transformational leadership*. Transactional leadership is generally sufficient for maintaining the status quo. But transformational leadership focuses on development for the purpose of change. It motivates followers to do more than they originally expected or they thought possible. For teachers' professional motivation, many researchers indicated that the transformational leadership from principals is crucial for teachers' motivation to participate in CPD (e.g., Eyal & Roth, 2011; Geijsel et al., 2009; Y. Yang, 2014).

6.3.2 The effects of workplace conditions on teachers' motivation to participate in Continuous Professional Development

Many studies have indicated that workplace conditions in school can have a significant influence on teachers' motivation for CPD. For example, Thoonen et al. (2011) showed that task autonomy reinforced the extent to which teachers internalized school values as their personal goals and subsequently affected their motivation to engage in CPD. Ishler et al. (1998) demonstrated that teachers' motivation for professional learning was closely related to the support they received from their col-

leagues. In a study on teachers' workplace, Rosenholtz (1989) indicated that work pressure is generally regarded as a job challenge. They measured teachers' work pressure and reported that the more challenges teachers reported in their workplace conditions, the more prone they were to maintain their present mode of instructions and to avoid mistakes, and the more reluctant they were to participate in CPD. With respect to transformational leadership from principals, Ishler et al. (1998) demonstrated that teachers' motivation for professional learning was closely related to the transformational leadership support they received from the principal. Principal transformational leadership also positively influenced the degree to which teachers become involved in the educational reform.

Besides these direct effects of workplace conditions on teachers' motivation to participate in CPD, studies in the field of human resource development reported that workplace conditions should be considered as important moderators for people's goal pursuits (Kasser & Ryan, 1993). For our study, this would mean that the relationship between teachers' characteristics and their motivation to participate in CPD may differ depending on the perceptions of various working conditions in school. Yet there is no empirical research as far as we know, addressing the moderating effects of workplace conditions on the relationship between teacher characteristics and teachers' motivation to participate in CPD activities. These insights are needed to understand not only what kind of teachers are motivated to develop themselves, but also how and under what conditions this might be done best. In this research, we selected "New Basic Education" (NBE) as our research context. The following research question directed our study:

Q1: Which workplace conditions are related to teachers' autonomous motivation to participate in NBE?

Q2: Which workplace conditions moderate the relationship between teacher personal factors and their autonomous motivation to participate in NBE?

6.4 Method

6.4.1 Procedure and participants

In this study, 523 teachers from 12 primary schools in Shanghai (China) participated

in this study. They all participated in NBE. The first author visited each school and sent the questionnaire directly to teachers. They completed the questionnaire individually at their offices, which took about 30 minutes. In total, 51 teachers had not fully completed the questionnaire on the part of teacher personal factors or school workplace conditions. The questionnaires of these teachers were removed, resulting in the sample of 472 teachers who were included in the analysis. For a few missing items, imputation was used to reduce the number of missing values: missing values were replaced with the mean score of other items from the same dimension.

Participation in the study was strictly voluntary and confidential. Upon recruitment, principals authorized the study within their schools, and teachers were asked to sign an informed consent regarding their collaboration in the study. Ethics approval for this study was granted by the Leiden University Graduate School of Teaching (ICLON). The mean age of teachers is 37.7 years (SD=8.5). Participants' information is displayed in Table 6.1.

Table 6.1

Participant information (N=472)

	Participants	N
Gender	Female	425
	Male	47
Subject	Chinese	162
	English	113
	Mathematics	102
	Art	23
	Music	20
	Others	52
Teaching experience	0–3 years	55
	4–6 years	70
	7–18 years	148
	19–30 years	169
	31-plus years	29

6.4.2 Teacher autonomous motivation

Teachers' motivation to participate in NBE was assessed using the Teacher motivation inventory (Lam et al., 2010). The teacher motivation inventory was modelled after the Self-regulation questionnaire (Ryan, Stiller, & Lynch, 1994). The instrument consisted of four subscales (External regulation, Introjected regulation, Identified regulation, Intrinsic motivation) with five items per scale, constituting a total of 20 items. The items were presented randomly. Teachers were asked to indicate their feelings of motivation on a five-point scale (1=Strongly Disagree, 2=Disagree, 3=Neither Agree nor Disagree, 4=Agree, 5=Strongly Agree). The 20 motivation items were subjected to an exploratory principal component factor analysis with oblimin rotation to determine the underlying factors. Oblimin rotation is a common method used in factor analysis that allows correlations between the underlying factors (Jackson, 2005). Three components were extracted, based on factor loadings of 0.4 or higher and the absence of cross-loadings, explaining 44%, 15%, and 7.7% of the variance in motivation scores, respectively. The first component included both intrinsic motivation and identified regulation, and therefore labelled as Autonomous motivation. This means that teachers engage in a learning activity for its inherent enjoyment and pleasure, or they pursue a meaningful outcome from the activity. One example item is "I participated because I am interested in it." The other two components were introjected regulation and external regulation, which refers to Controlled motivation. Because previous research shows positive relations between autonomous motivation for professional learning and their outcomes (Roth et al., 2007) and negative or zero effects of controlled motivation (Gagné & Deci, 2005), we focus on teachers' autonomous motivation for learning in the current study.

6.4.3 Teaching experience

Teachers' teaching experience refers to the number of years of teaching in the classroom. In this study, teaching experience was divided into five categories(Huberman, 1989): zero to three years of teaching experience (Career entry stage); four to six years of teaching experience (Stabilization stage); seven to 18 years of teaching experience (Experimentation-diversification stage); 19 to 30 years of teaching experience (Serenity stage); and 31 or more years of teaching experience (Disengagement stage).

6.4.4 Self-efficacy

Teachers' self-efficacy was assessed using the Teachers' sense of efficacy scale (TSES, 12 items) developed by Tschannen-Moran and Hoy (2001), which includes three subscales: 1) Instructional strategies, 2) Classroom management and 3) Student engagement. The 12 items were subjected to an exploratory principal component factor analysis with oblimin rotation to determine the underlying factors. The final factor analysis consisted of two components of 11 items, based on factor loadings of 0.4 or higher and the absence of cross-loadings. These two factors explained 55.3% and 9.6% of the variance in self-efficacy scores, respectively. The first component was labelled Efficacy in classroom teaching (7 items) and comprised items from the original scale Instructional strategies and Student engagement. The example item is "How much can you do to motivate students who show low interest in school work?" The second component was labelled Efficacy in classroom management (4 items). An example item is "How much can you do to control disruptive behaviour in the classroom?" Teachers indicated their perceptions of self-efficacy on a nine-point scale: 1= nothing, 3= very little, 5= some influence, 7= quite a bit, 9= a great deal. The Cronbach's alphas of Efficacy in classroom teaching and Efficacy in classroom management are 0 .88 and 0.88, respectively, showing satisfying reliabilities for both scales.

6.4.5 Teacher conceptions of learning

In order to capture teacher beliefs about student learning as well as their own learning, 46 items were derived from the Teacher conception of learning developed by Bolhuis and Voeten (2004), including five subscales and 46 items: External versus internal regulation, Reproductive versus constructive knowledge, Individual versus social learning, Fixed versus dynamic ability and Intolerance of uncertainty versus tolerance of uncertainty. Teachers stated the extent to which they agreed with the learning conception for themselves and for their students. A four-point scale was used with scores 1 and 2 indicating (strong) agreement with the left side of the dimension and scores 3 and 4 with the right side. Reliability analysis of teacher conception of student learning revealed that only Reproductive versus Constructive Knowledge (α=0.64), Individual versus Social Learning (α=0.59) and Fixed versus Dynamic Ability (α=0.67) showed acceptable Cronbach alphas. For teachers' con-

ceptions of their own learning, only Fixed versus Dynamic Ability (α=0.67) showed satisfactory reliability. These four scales were labelled Conception of student knowledge, Conception of student teamwork, Conception of student ability and Conception of their own ability, and were included in subsequent analyses.

6.4.6 Principal transformational leadership

Transformational leadership refers to vision building through initiating and identifying a vision for the school's future, providing individual support and intellectual stimulation (Silins, 1994). In this study, principal transformational leadership was measured by 6 items from a questionnaire on School leader transformational leadership (Geijsel et al., 2009). The Cronbach's alpha for principal support is 0.91, indicating satisfactory reliability.

6.4.7 Workplace conditions

For this study, we used a questionnaire from Wal et al. (2020) to evaluate teachers' perceptions of workplace conditions. Finally, the questionnaire comprises 19 items, answered on a 4-point Likert type scale with 1= "almost never" to 4= "almost always". An exploratory principal component factor analysis with oblimin rotation was performed in order to determine the underlying factors. Four scales were distinguished, based on factor loadings of 0.4 or higher and the absence of cross-loadings: 1) Emotional pressure – four items explaining 25.7% of the variance in scores, showing teacher emotional pressure at work; with items such as: "Do you experience a major emotional workload?" 2) Task autonomy – four items explaining 15.5% of the variance in scores, demonstrating how teachers perceived their autonomy at work; with items such as: "Can you decide for yourself how you carry out your work?" 3) Colleague support – four items explaining 10.2% of the variance in scores, indicating teachers' receipt of support from colleagues; with items such as: "My fellow colleagues are willing to listen to my work-related problems?"4) Work pressure – five items explaining 7.1% of the variance in scores, showing teachers' perceived pressure from their work, with items such as: "Do you have to work very fast?" The Cronbach's alphas for emotional pressure, task autonomy, social support from colleagues, and work pressure are 0.81, 0.62, 0.68, and 0.73, respectively, indicating moderate to high reliability. The labels of these four factors were similar to

the original questionnaire used by Wal et al. (2020).

The scores on these five workplace conditions in school were aggregated at the school level as the workplace conditions in a school can be understood as the shared perceptions among teachers in the same school (Schneider & Reichers, 1983). The homogeneity of factors from workplace conditions was assessed by the within-group interrater reliability statistic (r_{wg}). The within-group interrater reliability statistic is a common index to measure the interrater agreement and can be used to determine the appropriateness of aggregating data to higher levels of analysis (Kerrins & Cushing, 2000). A low r_{wg} estimate means samples within the group do not agree, or perceive the construct similarly, and these variables must exceed a threshold of homogeneity to index consensus and justify aggregation to the relevant unit of analysis. A 0.70 criterion has been commonly used (George, 1990). In this study, resulting in $r_{wg(j)}$ = 0.924 for colleague support, $r_{wg(j)}$ = 0.954 for work pressure, $r_{wg(j)}$ = 0.906 for task autonomy, $r_{wg(j)}$ = 0.812 for principal transformational leadership, and $r_{wg(j)}$ = 0.858 for emotional pressure, showing acceptable levels of within-group agreement.

Table 6.2

Descriptive statistics for the dependent and independent variables

	Number of items	Mean	SD	α	N
Teacher motivation					
Autonomous motivation	10	3.88	0.63	0.94	472
Teacher characteristics					
Efficacy in teaching	7	6.35	1.08	0.88	472
Efficacy in classroom management	4	6.91	1.29	0.88	472
Conception of student knowledge	4	3.48	0.54	0.64	472
Conception of student teamwork learning	4	3.26	0.54	0.59	472
Conception of student ability	5	3.07	0.55	0.67	472
Conception of their own ability	4	3.32	0.55	0.67	472
Workplace conditions in school					
Principal leadership	6	3.07	0.65	0.91	472
Emotional pressure	4	2.26	0.64	0.81	472
Work pressure	3	3.24	0.62	0.73	472
Colleague support	4	2.80	0.52	0.68	472
Task autonomy	4	2.21	0.58	0.62	472

Note. SD= standard deviation.

6.4.8 Analysis

Data on teacher background, self-efficacy, and conceptions of learning, were at teacher level (Level 1), and the aggregated data on Work pressure, Emotional pressure, Task autonomy, Colleague support, and Principal transformational leadership, were at the school level (Level 2). Multilevel regression analyses were performed with factors at level 1 and 2 as predictors of teachers' autonomous motivation. A step-by-step approach was applied using Mplus 8, a statistical modelling program that provides researchers with a flexible tool to analyse multilevel data (Muthen &

Muthen, 1998). In this study, Mplus 8 can estimate two-level models to explore the moderating effects of workplace conditions on the relationship between teachers' personal factors and their autonomous motivation for participation in NBE.

First, a variance components (model 0) model was built to examine the variance in teachers' autonomous motivation at both level 1 (Teacher) and level 2 (workplace conditions). In the second and third step, the factors from teacher level (model 1) and the workplace conditions level (model 2) were added to model 0 respectively. In the fourth step (final model 3), all the direct effects and cross-level interactions were added to the equation. All predictors were grand-mean centred.

6.5 Results

The results from the unconditional model (model 0) indicate that the variance of the within-group component equals $\sigma^2 = 0.382$, and the variance of the between-group components equals $\tau = 0.024$. The interclass correlation value (ICC) =0.059, suggesting that 5.9 % of the variance in autonomous motivation is at the school level. The descriptive statistics for the dependent and independent variables are shown in Table 6.2.

6.5.1 Direct effects of workplace conditions in school

With respect to the workplace conditions, a significant relationship between four predictors and autonomous learning motivation has been found (see Table 6.3). First, support from colleagues (γ_{01}= -0.470, p=0.021) and emotional pressure (γ_{01}= -0.597, p= 0.001) are negatively related to teachers' autonomous motivation, implying the more support teachers perceived from their colleagues, and the more emotional pressure teachers reported, the less autonomously motivated they are for professional learning activities. Secondly, work pressure (γ_{01}= 0.766, p=0.001) and support from principals (γ_{01}= 0.379, p< 0.001) are positively related to autonomous motivation, implying the more work pressure and support from principals teachers reported, the more autonomously motivated they are for professional learning. The results also indicate an insignificant within-group relationship between task autonomy and autonomous motivation (γ_{01}= 0.201, p= 0.214).

Table 6.3

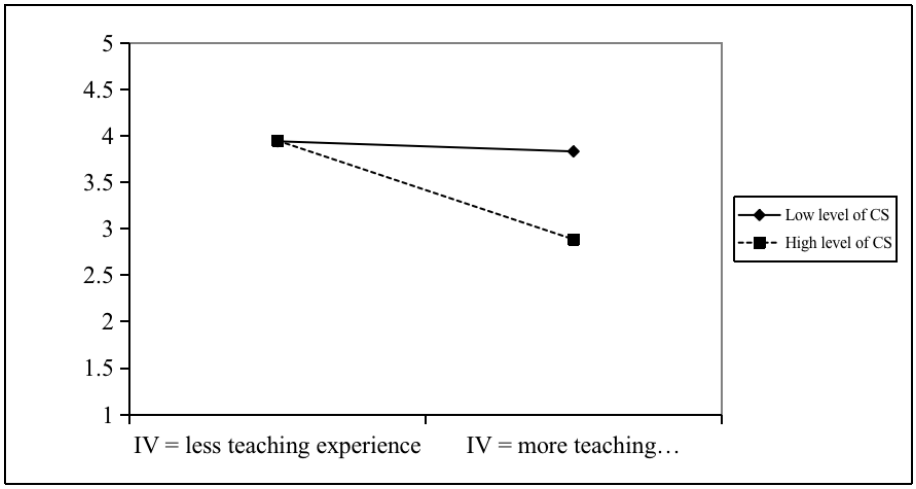
The result of multilevel analyses for teacher autonomous motivation

Fixed effects	Model 0 *B (SE)*	Model 1 *B (SE)*	Model 2 *B (SE)*	Model 3 *B (SE)*
Intercept	3.879**(0.051)	1.664**(0.271)	3.908** (0.029)	3.887** (0.024)
Level 1 main effects				
Teaching experience		-0.047* (0.020)		
Efficacy in teaching		0.147**(0.039)		0.299** (0.027)
Efficacy in management		-0.033* (0.026)		
Conception of student knowledge		-0.014 (0.030)		
Conception of student teamwork		0.127* (0.042)		
Conception of student ability		0.236* (0.055)		
Conception of teacher ability		0.173*(0.051)		
Level 2 main effects				
Principal transformational leadership			0.379**(0.105)	0.367** (0.101)
Task autonomy			0.201 (0.162)	
Work pressure			0.766** (0.235)	0.789* (0.272)
Emotional pressure			-0.597** (0.180)	-0.620** (0.167)
Colleague support			-0.470* (0.203)	-0.470* (0.162)
Cross-level interactions				
Colleague support× Teaching experience				-0.472* (0.149)
Task autonomy × Efficacy in teaching				-0.447* (0.204)
Random				
Level 1 (within)	0.382** (0.031)	0.293**(0.022)	0.379** (0.030)	0.321** (0.026)
Level2 (between)	0.024 (0.017)	0.012**(0.008)	0.001 (0.004)	0.002 (0.012)
Model statistics				
R^2		0.494	0.621	0.685

*Note: only significant direct effects and cross-level interactions are shown in the Model 3. SE= standard error. * = P< .05, **= P< .001*

6.5.2 Indirect effects of workplace conditions in school

Since the moderator effects were included in model 3, some teacher characteristics, which are important for teachers' motivation in model 1, not related to teachers' motivation in model 3. The result of these moderator analyses shows two significant cross-level interaction effects. First, the relationship between teaching experience and autonomous learning motivation is moderated by colleague support (γ_{11}= - 0.472, p = 0.002), which means that the relationship between teaching experience and autonomous motivation is more negative in schools where the support from colleagues is perceived as higher. We illustrate this effect in Figure 6.1. For experienced teachers, there is a negative relationship between support from colleagues in school and teachers' motivation. For beginning teachers, the support from colleagues in school generally does not make a difference for their motivation for professional learning.



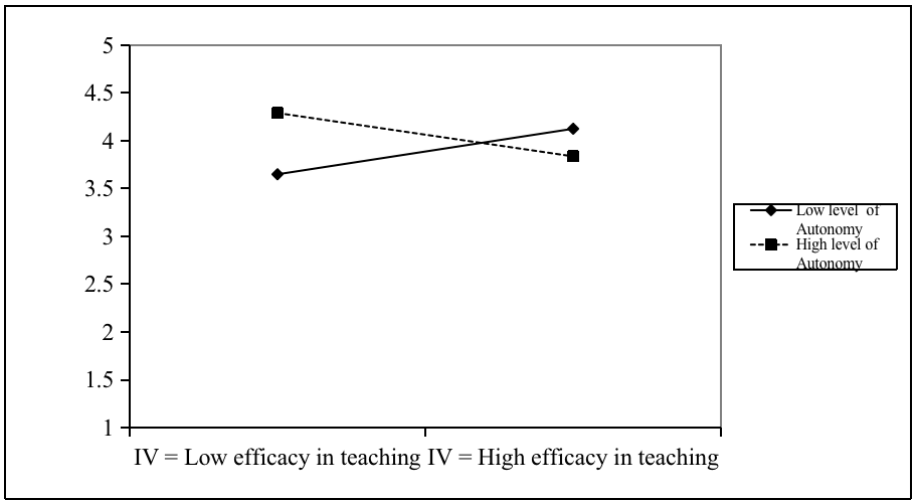
Note: CS= Colleague support, IV= Independent variable

Figure 6.1

Moderation effect of colleague support on the relationship between teacher's teaching experience and their autonomous motivation to participate in NBE.

Second, we find a cross-level interaction between task autonomy and self-efficacy in classroom teaching on autonomous motivation for learning (γ_{11}= -0.447, p= 0.028), which means that the relationship between teacher self-efficacy in classroom teaching and autonomous motivation is different for schools with low and high scores for task autonomy. We illustrate this cross-level interaction in Figure 6.2. Low-effi-

cacious teachers are more motivated in schools with a high level of task autonomy, compared to low levels of task autonomy. For high-efficacious teachers, task autonomy at the school level is generally not related to their autonomous motivation for learning.



Note: IV= Independent variable

Figure 6.2

Moderation effect of task autonomy on the relationship between teacher's teaching experience and their autonomous motivation for participation in NBE.

6.6 Discussion and conclusion

The results indicate that four school condition variables (principal transformational leadership, work pressure, emotional pressure, and colleague support) are related to teachers' autonomous motivation for NBE. In addition, two school condition variables (colleague support and task autonomy) moderate the relationship between teachers' personal factors and their motivation for NBE. In this section, we will discuss our main findings.

6.6.1 Workplace conditions related to teachers' autonomous motivation to participate in NBE

Firstly, the principal transformational leadership appeared to be related to teachers'

autonomous motivation. Previous studies have indicated that Chinese principals have a large influence on teaching (Xin & Fred, 2014; Y. Yang, 2014). Our findings extend this finding, by showing that Chinese principals not only influence teaching, but also their motivation to participate in professional learning activities. Our results indicate that through initiating and identifying a vision for the school's future, providing individual support and intellectual stimulation, principals could stimulate Chinese teachers' autonomous motivation to participate in NBE.

In addition, our results indicate that different types of pressure have different effects on teachers' motivation. Work pressure is positively and emotional pressure is negatively related to teachers' autonomous motivation for learning. Crawford, LePine, and Rich (2010) identified work pressure as a job challenge. For teachers, meeting these challenges may be perceived as an opportunity to learn and to exercise and show capacities. According to the perspective of self-determination theory (Deci & Ryan, 2002), meeting the demands of the challenges can satisfy the need for competence and lead to motivation for learning. Compared to work pressure, emotional pressure is more likely to cause teachers' emotional exhaustion, which may decrease teachers' autonomous motivation to learn. There is some evidence that teachers' emotional exhaustion may decrease their learning motivation as such pressure may distract their attention from professional learning and work affairs (Kwakman, 2003; Pelletier et al., 2002).

Our results also indicate that colleague support is negatively related to teachers' autonomous motivation to participate in NBE. This result contradicts the findings of previous research claiming that support from colleagues has a positive influence on teachers' learning motivation (Supovitz et al., 2010; Thoonen et al., 2011; X. Zhang & Wong, 2018). One possible explanation might be that teachers may not be motivated to participate in NBE when they have received support from their colleagues. In that case, teachers think they can ask for support from their colleagues to solve their problems.

6.6.2 Perceived workplace conditions moderating the relationship between teacher characteristics and teachers' autonomous motivation to participate in NBE

Two moderating effects of perceived workplace conditions have been found. First, our results indicate that experienced teachers' autonomous motivation is negatively influenced by support from colleagues, whereas, for beginning teachers, the support from colleagues in schools does not make a difference for their autonomous motivation for professional learning. The possible explanation for the negative relationship between colleague support and motivation of experienced teachers might be that when experienced teachers think they can learn from their colleagues, they are less motivated to participate in additional professional learning activities. This finding corroborates the findings of other researchers that with an increase in teaching experience, teachers become less likely to participate in professional learning (Hildebrandt & Eom, 2011; Louws et al., 2018; Maskit, 2011). Although the support from colleagues is helpful for their professional development, beginning teachers are still motivated to participate in various professional learning activities to continuously improve their ability.

Second, we also found a significant negative moderating effect of task autonomy on the relationship between teachers' self-efficacy in teaching and their autonomous motivation. Our results indicate that compared to high-efficacious teachers, low-efficacious teachers were more motivated when they stay in schools with a high level of task autonomy. It means that for low-efficacious teachers, the high level of task autonomy is crucial to improve their autonomous motivation to participate in NBE. Although many studies have explored the influence of task autonomy on teachers' learning motivation, our study suggests that this is different for low-efficacious and high-efficacious teachers. Low-efficacious teachers in schools with relatively low levels of task autonomy might be focused on "doing what is expected from them" to receive recognition by their principal and to improve their confidence that they can meet the requirements. In contrast, low-efficacious teachers in schools with relatively high levels of task autonomy might feel enough autonomy to attend professional learning activities in order to improve their capabilities. This differential effect of task autonomy in school is also reported by Mintzes et al. (2013). Based on interviews with teachers they reported that low-efficacious teachers showed greater

enthusiasm to participate in NBE when they could make their own decisions about their work and learning, compared to high-efficacious teachers.

6.7 Implications for school leaders

Our findings can have implications for school leaders and policymakers to implement strategies that foster teacher motivation to attend NBE programs.

Firstly, our data indicated that compared to inexperienced teachers, experienced teachers were less motivated to participate in learning activities as they seem to more willing to seek help from their colleagues. Given this, school leaders could provide more challenges to experienced teachers to not only make their work more satisfying and fulfilling, but also stimulate participation in professional learning activities to acquire new capacities needed to take up these challenges. These new challenges can be related to innovative pedagogies such as inclusive teaching or the use of adaptive technology to support student learning, but also to other roles in school as mentoring newly arrived teachers and providing workshops for their colleagues.

Secondly, our findings indicated that the level of task autonomy in school is crucial for low- efficacious teachers' participation in professional learning activities. School leaders could give low-efficacious teachers more freedom in the decision-making in the learning process, and built a culture of an autonomy-supportive working environment within schools.

6.8 Limitations

One limitation is that our study only used quantitative methodologies to explore the moderation effects of workplace conditions on the relationship between teachers' characteristics and their autonomous motivation for learning. Since teachers' perceptions of motivation are a complex psychological mechanism and various psychological and organisational circumstances affect teachers' motivation, we advise future studies to use additional qualitative methodologies (e.g., in-depth face-to-face interviews) to provide a better understanding of teachers' motivation and influential factors.

6.9 Concluding remarks

This study explored the relationship between perceived workplace conditions in schools and teachers' autonomous motivation. In addition to the direct effects of school conditions on teachers' motivation to participate in NBE, two workplace conditions in schools, task autonomy, and colleague support, moderated the relationship between teacher characteristics and motivation. These findings can have implications for school leaders and policymakers to implement strategies that foster teacher motivation to attend NBE. In order to provide a better understanding of teachers' learning motivation, future studies could also use qualitative methodologies to further explore the inner psychological mechanism of teachers' perceptions of motivation.

SUMMARY AND GENERAL DISCUSSION

7.1 Introduction

This research project intends to contribute to our understanding of possible ways to stimulate teachers' learning motivation and improve their learning performance in professional development (PD) programmes. In China, New Basic Education is a PD programme that is initiated by Chinese researchers, aimed to improve teaching quality to meet the challenges of a fast-changing society. This research is based on three assumptions: (1) Teaching quality has been significantly improved after a period of study in NBE, (2) teachers' teaching quality and their learning motivation are interrelated, and (3) teacher personal characteristics and school working conditions are important for their learning motivation. Accordingly, the general aim of this research project is threefold. First, it aims to explore the effects of NBE on teaching quality. Second, it intends to investigate the relationship between teachers' learning motivation and teaching quality when they participated in NBE. Third, it aims to find important factors that can be used to stimulate teachers' learning motivation and enhance teaching quality when they participate in NBE. To achieve the above-mentioned goals, teachers who were involved in NBE from Shanghai participated in this project to explore teachers' perceptions of learning motivation, and their students are asked to indicate their perceptions of teaching. In addition, we also invite 10 academic supervisors from NBE to evaluate teaching. The results drawn from the data set are discussed in Chapter 2 to 6.

The next sections first provide an overview of the findings of each Chapter. Second, the general discussion is presented, followed by limitations and suggestions for future research, and implications of this study for PD aimed at enhancing teachers' learning motivation and learning performance.

7.2 Summary of the studies

7.2.1 Chapter 2

The first aim of this research project is to explore the effects of NBE on teaching quality. In line with this purpose, in Chapter 2, we explored how students and supervisors evaluate teaching quality, and addressed the following research questions: *1. What is the relationship between supervisors' and students' evaluations of instructional quality? 2. What are the evaluation criteria used by supervisors and students?*

To answer these questions, a total of 20 teachers from 12 primary schools participated in this project and their classroom teaching practices were videotaped and send to 10 supervisors for evaluation. Moreover, 497 students of 20 teachers participated in this study to evaluate their teachers' teaching. Mix methods were applied to explore students' and supervisors' evaluations of teaching quality.

Our results indicate that students rated most of their teachers as good quality instructors, whereas supervisors held the opinion that the majority of teachers had a relatively low level. Moreover, it seems that students and supervisors used different quality criteria, and focussed on different aspects of instructional quality. Students seemed to be more focused on learning climate, activating teaching and adaptation of teaching, whereas supervisors seemed to pay more attention to classroom management, clarity of instruction, and teaching strategies. Given both observations and student surveys have strengths and weaknesses, both methods should be seen as complementary ways to evaluate teaching.

7.2.2 *Chapter 3*

This research project firstly intends to explore the influence of NBE on teaching quality. Therefore, we explored the effect of NBE on teachers' teaching, the following research questions are addressed: *1. Do teachers improve their teaching quality as evaluated by their students during participation in the NBE program? 2. How are teacher characteristics, school working conditions and principal's transformational leadership related to the changes in teaching quality?* To answer these question, two waves of questionnaire data from 375 teachers were collected. The first questionnaire (T1) was administered in October 2017, and the second (T2) in April 2018. A paired-samples t-test was carried out for two teaching quality scales together at two different times to test whether the change was significant. Then stepwise regression analyses were performed to assess the relationship between teacher personal factors, working conditions and principal transformational leadership, on the one hand, and changes in teaching quality, on the other hand.

Results of regression analyses show that teachers generally received higher scores on teaching quality after the program than before. Three factors are significantly and negatively related to the changes in quality: the negative influence of school leaders, emotional pressure, and teachers' educational level on the development of teachers'

teaching quality during the NBE. It means the support from Chinese school principals, emotional pressure, and teachers' educational level could be crucial for the improvement of teachers' teaching quality when teachers are involved in a PD program that emphasizes new teaching approaches. In particular, principals could offer teachers sufficient scaffolding and autonomy when teachers participate in educational reforms, which may help teachers to benefit from PD program that will make them be more innovative and forward-looking.

7.2.3 Chapter 4

The second aim of this research project is to explore the influence of teachers' motivation on their teaching quality. Therefore, in Chapter 4, we explored the impact of teachers' learning motivation, as well as other personal and environmental factors on teaching practices, the following question: *1. How are working conditions, school leadership, and teacher psychological factors related to students' perceptions of teaching? 2. Do teacher psychological factors mediate the relationship between working conditions, principal leadership, and students' perceptions of teaching?* To answer these question, 419 teachers and 11705 students from 12 primary schools in Shanghai participated in this project. Structural equation modelling was performed to explore the relationship between teachers' personal factors, working conditions and teaching quality.

The results indicate that teacher self-efficacy had a direct effect on the student perceptions of teaching. Support from colleagues had both direct and indirect effects on student perceptions of teaching. The perceived leadership from school leaders and teacher educators, task autonomy had indirect effects on the student perceptions of teaching via teachers' self-efficacy in teaching. These findings affirm the importance of teachers' self-efficacy to student perceptions of teaching quality. It not only directly affects student perceptions of teaching quality, but also indirectly affects teaching quality as an important mediator. Future research should pay more attention to the possible role of teacher self-efficacy in teachers' teaching and professional development.

7.2.4 Chapter 5

The third aim of this research project is to explore the factors that influencing teachers' motivation. Therefore, in Chapter 5, we explored how teachers' characteristics and school working conditions are both related to their learning motivation, the following questions: *"How are factors at the personal and school levels related to teachers' motivation to participate in professional learning?"* To answer these questions, 472 teaches participated in this study. Multivariance analyses of variance were performed with teacher characteristics and environmental factors as independent variables and the three motivation scales as dependent variables.

Our results indicate that that teachers' prior experience, self-efficacy in teaching, the conception of students' ability and their own ability, emotional pressure and principal leadership are significantly positively related to teacher autonomous motivation for learning. Teacher conception of students' ability, emotional pressure, and principal leadership showed a significant negative relationship with external regulation. Finally, only efficacy in teaching shows a significant positive relationship with introjected regulation. The results indicate that school leaders should reinforce the personal and social identity of teachers with the organization by initiating and identifying a vision in order to improve teachers' collective cohesion. Policy officials should give teachers more freedom in tasks and make teachers feel involved in the decision-making in the training programme.

7.2.5 Chapter 6

Since teachers' autonomous motivation is positively related to teacher learning outcomes. In Chapter 6, we specifically focused on teachers' autonomous motivation to explore the relationship between workplace conditions in schools and teachers' autonomous motivation to learn. The following research questions direct our study: *1. Which workplace conditions are related to teachers' autonomous motivation to learn? 2: Which workplace conditions moderate the relationship between teachers' characteristics and their autonomous motivation to learn?* To answer these questions, a questionnaire was completed by 472 teachers from 12 primary schools in Shanghai. Multilevel regression analyses were performed with factors at level 1 and 2 as predictors of teachers' autonomous motivation.

The results indicate that perceived support from colleagues had a positive effect and perceived work pressure had a negative effect on teachers' autonomous motivation to learn. In addition, these two variables moderated the relationship between teachers' teaching experience and their task autonomy, on the one hand, and their autonomous motivation to learn, on the other hand, with stronger relationships with high collegial support and low work pressure. Given this, school leaders could build a culture of an autonomy-supportive working environment within schools through providing more challenges to experienced teachers to make their work more satisfying and giving low-efficacious teachers more freedom to decide how they design their teaching.

7.3 General discussion

Based on our findings, the general discussion focuses on three main themes: the effect of NBE on teaching quality; the relationship between teachers' learning motivation and teaching quality; and the factors which are important for teachers' learning motivation.

7.3.1 The effects of NBE on teaching quality

To explore the influence of NBE on teaching quality, we use students' perceptions to evaluate the change in teaching quality after six months of participation in NBE. Our results show that teachers generally receive higher scores on teaching quality after the program than before. However, the differences are very small. It indicates that the effect of NBE on teaching quality is weak, and it seems difficult for teachers to change the way they teach the class in a short period of time when they collaborate with supervisors from universities. The reason for this might be that the training time is not long enough to change their classroom teaching. Maskit (2011) claims that it is always difficult for teachers to adjust their teaching within a short time, especially for experienced teachers. In this study, we assume that the new practices addressed in the NBE bear little resemblance to either teachers' current teaching approaches or the way they have learned from traditional programmes. Consequently, it is difficult for teachers to change the way they teach in the classroom at only six months period of learning time. Future studies could extend the pretest-posttest time to evaluate the change in teaching.

Another possible reason is the differences between teachers' prior learning experience. In this research project, teachers differed in the learning experience with the NBE, some teachers have participated in NBE for more than 5 years, however, some teachers only with 1 year or less experience. For the teachers with a long learning experience, it is possible that their teaching quality has been greatly improved after a long time of study, therefore, compared to teachers with a short learning experience, it might be more difficult for them to continuously improve their teaching during 6 months of learning in the NBE. As a consequence, the differences in scores on teaching quality are very small.

7.3.2 The relationship between teachers' learning motivation and teaching quality

One assumption of this research project is that teachers' learning motivation and their teaching quality are related. However, unlike our expectation, our results indicate that teachers' learning motivation and their teaching quality are not related. One possible explanation could be explained by the cultural difference between Western countries and Eastern countries. Chinese culture places more emphasis on collectivism rather than individualism (Ho & Chiu, 1994). According to Bochner (1994), in collective societies, such as those found among Chinese teachers, the individual is more absorbed in, and attached to, the group, and people are encouraged to do what is best for the community rather than the individual. In that case, Chinese teachers may be reluctant to offer straight and negative information about their learning motivation. For example, previous studies have indicated that if teachers with reasons for participating in PD are entirely external, such as avoiding punishment, or getting rewards, their learning performance is often associated with negative outcomes (Blais, Lachance, Vallerand, Briere, & Riddle, 1993; Deci et al., 2001; Gagné et al., 2010). However, in practice, Chinese teachers may be reluctant to offer such information when they fill in the motivation questionnaire as they are absorbed in schools. This may explain why teachers' learning motivation and their teaching quality are not related.

Although teachers' learning motivation is not related to teaching quality, this research project still explored the factors which are important for teaching quality and its development. Our result indicates that for teaching quality, teachers' self-efficacy

seems important. Many studies have reported the importance of self-efficacy for teaching (Gan et al., 2018; Georgios Gorozidis & Papaioannou, 2014; Lam et al., 2010; Thoonen et al., 2011). Aligned with previous studies, our results also highlight the importance of teachers' sense of self-efficacy for their learning and implementation of educational measures. For the development of teaching quality, our results report that emotional pressure and principal leadership are important. Just like the statement of Pelletier et al. (2002), teachers who are under more pressure are more likely to teach in a routine way, keeping their current method of instruction, and avoiding change and possible mistakes. Louws et al. (2018) also report that external support, especially the help from school leaders, is very important for teachers who decide to adapt their instruction to meet PD's requirement.

7.3.3 Factors which are important for teachers' learning motivation

In Chapter 5 and 6, we explored the effects of teacher personal factors, school working conditions and principal leadership on teachers' learning motivation. In line with our expectations, we found that several factors are related to their learning motivation. In addition, we also found that working conditions have the potential to have moderating effects on the relationship between teacher personal factors and their autonomous motivation to learn. It indicates that the relationship between teachers' characteristics and their learning motivation may vary across different workplaces with different conditions. Since no previous empirical research addressed this moderating effect, we assume this finding has the potential to fill the gap of current research, and provide us with more details and new views to understand teachers' learning motivation.

7.4 Methodological reflections

7.4.1 Measurement of teaching quality

In this research project, we used student questionnaires and classroom observation to evaluate teaching quality. However, the results indicate that there is a fairly low correlation between students' and supervisors' evaluations of teaching. Given this, it might be necessary to include more measurements to evaluate teaching quality. For example, teachers' self-report could be included to triangulate the measurement of

teaching quality from students and supervisors. Teachers' self-report could provide us with the opportunity to gain insight in how they perceive these new classroom practices, and what challenges they faced during implementation, which might be helpful for the validity and reliability of the measurement.

7.4.2 Mediating and moderating effects

In this research project, we explore the mediating effects of teacher characteristics on the relationship between working conditions and students' perceptions of teaching (*see Chapter 4*), and the moderating effects of working conditions on the relationship between teacher characteristics and teachers' autonomous motivation to learn (*see Chapter 6*). Baron and Kenny (1986) identified the mediator as a variable that explains the relation between the independent and the dependent variable, and how or why there is a relation between two variables. In the area of teacher education, several studies have shown that teachers' self-efficacy, motivation to learn, beliefs of learning have the potential to be treated as a mediator to explain the relation between school working conditions and teachers professional learning and teaching (Bandura & Adams, 1977; Liu, Yuan, & Zhang, 2018; Richardson, 1996). Based on these findings, in this research project, we treat teacher characteristics as mediators to explain how the influence of working conditions on teaching quality through teacher individual characteristics. We assume that particular work features such as work pressure and lack of autonomy may affect teacher characteristics such as self-efficacy, which in turn, would influence their teaching quality.

Moderators are variables that affect the direction and strength of the relationship between an independent or predictor variable and a dependent or criterion variable. Moderators indicate when or under what conditions a particular effect can be expected (Baron & Kenny, 1986). Studies in the field of human resource development reported that workplace conditions should be considered as important moderators for people's goal pursuits since the goals may differ depending on their perceptions of various working conditions (Kasser & Ryan, 1993). In this research project, we assume that teachers' autonomous motivation may vary across different schools, the working conditions such as work pressure, collegial support would affect the strength of the relation between teacher personal factors (e.g., beliefs of learning, self-efficacy) and their autonomous motivation.

However, Baron and Kenny (1986) also report that some variables can be both mediators and moderators. In this research project, we assume that besides mediators, teacher characteristics also have the potential to play the role of moderators for the relation between school working conditions and teaching quality. For example, teachers' sense of self-efficacy may have a moderating effect on the relationship between principal leadership on teaching quality, since many studies have reported that compared to low-efficacious teachers, high-efficacious teachers are more possible to change their teaching practices when they follow with principals with a high level of leadership (Supovitz, Sirinides, & May, 2010; Zhao, Valcke, Desoete, Sang, & Zhu, 2014).

7.4.3 Issues of generalisability

Firstly, the generalisability of the conclusions from this research project should be carefully discussed. In these studies, empirical data have been collected from students and teachers from primary schools in Shanghai, China. We should be careful about generalizing our conclusions to teachers from rural regions in China. Shanghai is one of the largest cities and the economical centre of China, teachers from Shanghai are well-trained and have many opportunities to participate in various professional learning activities. However, the teachers in Shanghai might not be representative of teachers in rural areas in China. Teachers from rural areas are less-trained and lack sufficient opportunities to participate in PD programmes to improve their teaching quality. The huge gap in learning opportunities may their different attitudes toward participation in PD, and therefore prevent us to generalize our conclusions to teacher education in other regions in China.

Secondly, our results indicate that principal leadership and emotional pressure related to Chinese teachers' learning motivation, which is the same as in previous research conducted in Western countries. However, for the colleague support and task autonomy, which are understood to affect Wester school teachers, are not related to Chinese teachers' learning motivation. This discrepancy may be attributed to the Chinese collectivistic culture. Teachers may be reluctant to ask for help and obligated to sacrifice their freedom in performing a task for the greater performance of the school. Therefore, we argue that the Chinese context might be so specific that it would be careful to generalize to teacher education in Western countries. Yet we assume that

our conclusions could be generalized to other Asian countries with a similar culture of teaching and learning, such as Japan and Korea. In addition, the findings of the current study also generate hypotheses about factors related to teaching and motivation that can be tested in contexts outside East-Asia.

7.5 Implications

Several practical implications for teacher professional learning in schools can be drawn from this study on two levels: (1) teachers' learning performance, and (2) teachers' learning motivation. These implications relate to how to stimulate teachers' learning motivation and how to improve learning performance when they participated in a professional learning activity.

7.5.1 Stimulation of teachers' learning motivation

Our results indicate that task autonomy is important for teachers' learning motivation, to stimulate teachers' learning motivation. Therefore, PD should not be organized top-down, but should be organized together with teachers. Teachers should be provided with an autonomy-supportive working environment to reduce their pressure, and encouraged to develop their confidence in their ability to change their teaching (Pelletier et al., 2002). In addition, PD should reinforce the personal and social identity of teachers within the organization by initiating and identifying the vision of teaching and learning. As a result, teachers may feel more willing to internalize organizational goals as their personal goals, which-in turn-might increase their autonomous motivation to learn.

Moreover, our results indicate that compared to inexperienced teachers, experienced teachers were less motivated to participate in learning activities. Given this, school leaders could provide more challenges to experienced teachers to not only make their work more satisfying and fulfilling, but also stimulate them to implement acquired capacities and knowledge into their teaching practices. These new challenges can be related to innovative pedagogies such as inclusive teaching or the use of adaptive technology to support student learning, but also to other roles in school as mentoring newly arrived teachers and providing workshops for their colleagues. Secondly, our findings indicate that the level of task autonomy in school is crucial for low- effica-

cious teachers' participation in professional learning activities. School leaders could give low-efficacious teachers more freedom in the decision-making in the learning process, and built a culture of an autonomy-supportive working environment within schools.

7.5.2 Support teachers' learning performance

We have explored the factors which are important for teaching quality and its development when they participated in NBE in Chapter 3 and 4. The results from Chapter 3 seem to stress the importance of self-efficacy. Consequently, if school leaders aim to improve teachers' instruction quality, they need to discuss possible strategies for individual teachers to help each teacher to develop more self-efficacy and resilience in dealing with future challenges in their teaching and make teachers feel more confident in their teaching behaviour. For example, establish specific short-term goals that will challenge the teachers, however, are still viewed as attainable, or help teachers lay out a specific learning strategy and have them verbalize their plan. Principals also should reinforce their leadership and give more support and freedom to increase teachers' self-efficacy − for example, set up some areas of the professional learning activities that allow teachers to make their own decisions, such as flexible assignment options or self-determined due dates.

We have found that the work pressure is negatively related to the change in teaching quality in Chapter 4. Accordingly, if principals want to improve teaching quality, they should first to take measures to reduce teachers' work pressure. For example, spend time and dialogues with teachers to try to understand their concerns, treat teachers with respect in front of other colleagues, value teachers' ideas and opinions, and design strategies for an individual teacher to further improve teaching practices.

7.6 Final conclusion

In closing, we can conclude that teachers' learning motivation and their teaching quality are not interrelated, however, we have identified several factors which are important for teachers' learning motivation and their teaching quality.To support teachers' learning and teaching, policymakers should value individual needs in setting the agenda for PD, and provide individual and intellectual support within a safe

learning climate. At the same time, it is not only policymakers who can improve the effectiveness of PD, but also teachers themselves. It is important for teachers to show recognition in PD, and understand that they could be beneficial for the overall learning activities. Participation in PD is not only about becoming better in the teaching job, but also about personal development. These measures may be beneficial to stimulate teachers' learning motivation and improve the quality of teaching.

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APPENDICES

Appendix 1 Student questionnaire of teaching quality

For each of the questions below, circle the response that best characterizes how you feel about the statement, A four-point scale is used: 1= Strongly disagree , 2= disagree, 3= agree, and 4= Strongly agree.

	Strongly disagree	disagree	agree	Strongly agree
1. In our class none of the students disturb the lesson	1	2	3	4
2. In our class we are working on tasks that I have to think about very thoroughly	1	2	3	4
3. Our teacher is nice to me even when I make a mistake	1	2	3	4
4. In our class students are quiet when the teacher speaks	1	2	3	4
5. Our teacher cares about me	1	2	3	4
6. Our teacher asks me what I have understood and what I haven't	1	2	3	4
7. Our teacher encourages me when I find a task difficult	1	2	3	4
8. In our class everybody listens and students are quiet	1	2	3	4
9. Our teacher tells me how to do better when I make a mistake	1	2	3	4
10. Our teacher asks questions that I have to think about very thoroughly	1	2	3	4
11. Our teacher likes me	1	2	3	4
12. In our class nobody interrupts with talking	1	2	3	4
13. In our class gives us tasks that seem to be difficult at a first glance	1	2	3	4

14. Our teacher tells me what I'm already good at and what I still have to learn	1	2	3	4
15. In our class everybody follows the teacher	1	2	3	4
16. Our teacher asks what we know about a new topic	1	2	3	4
17. Our teacher is friendly to me	1	2	3	4
18. Our teacher gives us tasks I like to think about	1	2	3	4
19. Our teacher compliments me when I did something good	1	2	3	4
20. Our teacher wants me to be able to explain my answers	1	2	3	4
21. Our teacher believes that I can solve difficult tasks	1	2	3	4

Appendix 2 Classroom observation Form

Scale	Items	Score	Examples, Reasons, Comments
1.Classroom management			
	Ensures efficient classroom management	1,2,3,4,5	
	Ensures the orderly progression of the lesson	1,2,3,4,5	
2.Classroom teaching			
2.1 Safe and stimulating climate	Promotes the mutual respect and interest of students	1,2,3,4,5	
	Supports the self-confidence of students	1,2,3,4,5	
	Shows respect for students in behaviour and language use	1,2,3,4,5	
	Ensures a relaxed atmosphere	1,2,3,4,5	
	Encourage students to do their utmost	1,2,3,4,5	
2.2 Clear instruction	Checks whether students understand the lesson content	1,2,3,4,5	
	Gives clear explanations of the learning materials and assignments	1,2,3,4,5	
	Clarifies the lesson objectives at the start of the lesson	1,2,3,4,5	

	Evaluates whether the objectives have been achieved at the end of the lesson	1,2,3,4,5
	Gives clear instructions and explanations	1,2,3,4,5
	Gives a well-structured lesson	1,2,3,4,5
2.3 Activating teaching	Involves all students in the lesson	1,2,3,4,5
	Uses teaching methods that activate the students	1,2,3,4,5
	Poses questions that encourage thinking	1,2,3,4,5
	Gives feedback on students' answers	1,2,3,4,5
	Uses learning time efficiently	1,2,3,4,5
2.4 Teaching learning strategies	Fosters critical thinking in students	1,2,3,4,5
	Stimulates students to think about solutions	1,2,3,4,5
	Teaches students how to break down complicated problems	1,2,3,4,5
	Let students speak aloud while thinking	1,2,3,4,5
	Teaches students how to check solutions	1,2,3,4,5
	Provides interactive instruction and activities	1,2,3,4,5
2.5 Adaptation of teaching	Adapts the assignments and processing to the relevant differences between students	1,2,3,4,5
	Adapts the instruction to the relevant differences between students	1,2,3,4,5
	Offers struggling learners extra learning or instruction time	1,2,3,4,5
	Supports the self-confidence of struggling learners	1,2,3,4,5

1: Please circle (voluntary) the correct answer: 0=no, I didn't observe this; 1=yes, I have observed this.

Appendix 3. Overview of the quotes from supervisors' comments in terms of classroom management

Classroom management	Students > Supervisors		Students = Supervisors		Students < Supervisors	
Teacher Number	High (STU)–Medium (OBS): 16, 217, 366, 353 Medium (STU)–Low (OBS): 431, 108, 226, 96		High (STU)–High (OBS): 23 Medium (STU)-Medium (OBS):114,63,333,283 Low(STU)–Low(OBS): 46		Medium (STU)–High (OBS): 228, 428 Low (STU)–Medium (OBS): 315, 42, 65, 208	
	Strong point	Weak point	Strong point	Weak point	Strong point	Weak point
Ensures efficient classroom management	1: '[…] students had the opportunity to express their own ideas' (Teacher 217). 2: '[…] she took a lot of effort to manage the class, it is obvious that she wanted to manage the classroom efficiently' (Teacher 96).	1: 'This teacher was too controlling, she retained full control of the classroom and activities. She led students' discussion, students are just followers' (Teacher 226). 2: '[…] the way she managed the classroom is not very interesting, can be boring for students, their minds may wander, and they may miss some important points'(Teacher 217).	1: 'This teacher tried her best to use different management strategies in a limited time. In conclusion, this teacher showed excellent classroom management skills' (Teacher 23).	1 '[…] in order to manage the classroom, she showed too much controlling behaviour. She did not allow students to express their opinions freely' (Teacher 46).	1: '[…] the teacher's organisation and management were relatively efficient' (Teacher 42).	1: 'She arranged many assignments in the lesson and did not give students enough time to express their own ideas' (Teacher 42).

		3: '[…] however, she still dominated this lesson and guided students' reflection. Therefore, students were lacking in some time and space for free discussion' (Teacher 96).			
Ensures the orderly progression of the lesson	1: '[…] she showed an orderly progression lesson' (Teacher 366).	1: 'This teacher paid much attention to the progression, ignoring the flexibility, it can be boring for students, their minds may wander, and they may miss some important points' (Teacher 217).	1: 'This teacher wanted to keep the progression is orderly. However, I think she took too much time on the exercise. Consequently, students did not have enough time on the reflection at the end of the lesson' (Teacher 333).	1: '[…] she showed some progression of the lesson' (Teacher 42).	1: 'She seemed to want to put much knowledge into students' mind in an only 35 minutes course, students seems cannot follow her progression' (Teacher 42).
		2: '[…] it seems that she did not highlight the important points during the progression of the lesson. And the transition of various structures is not very fluent. She failed to	2: '[…] the progression is intensive, it is obvious that she just focused on her own teaching objectives, and try to put as many assignments as possible into her		

show the connection and logicality between different parts' (Teacher 96).	lesson. It seems that students can not follow her ideas' (Teacher 46).

1: Quotes have been translated from Chinese and edited for length and legibility where applicable.

Appendix 4 Overview of the quotes from supervisors' comments in terms of classroom teaching

Classroom teaching	Students > Supervisors		Students = Supervisors		Students < Supervisors	
Teacher Number	High (STU)–Medium(OBS): 217, 333, 366, 353 Medium (STU)–Low (OBS): 226, 96		High (STU)–High (OBS): 16 Medium (STU)–Medium (OBS): 46, 428, 63, 283, 114 Low(STU)–Low(OBS): 108, 431		Medium (STU)–High (OBS): 23, 65, 228 Low (STU)–Medium (OBS): 42, 208, 315	
	Strong point	Weak point	Strong point	Weak point	Strong point	Weak point
Safe and stimulating climate	1: 'The atmosphere is relaxing, the teacher focused on the interaction with students and used a humorous way to talk with students, his attitude is friendly, the question he posed is also interesting' (Teacher 333). 2: 'This teacher-designed some good interactions and allowed students to speak what they wanted to say to activate students' interest. The	1: '[…] I am a bit doubtful of the effectiveness of the questions she asked' (Teacher 333).	1: 'This teacher created a relaxed atmosphere. She respected students' behaviour and language use, complimented students timely' (Teacher 16). 2: '[…] the atmosphere is comfortable, the teacher showed respect for students in behaviour and language use' (Teacher 46)	1: 'This teacher did not show any effort to create a safe climate, she even didn't allow students to express themselves. It is obvious that this teacher dominated the lesson' (Teacher 431). 2: '[…] although this teacher respected students, she failed to encourage students to develop their confidence in such a relaxed	1: '[…] however, she still showed her respect for the students in behaviour and language use' (Teacher 23).	1: 'It is hard to say the atmosphere is relaxing, the course seemed little intensive.'(Teacher 23). 2: '[…] it is difficult to say this teacher created a good climate' (Teacher 208). 3: '[…] the climate is not good. This teacher failed to design interactive activities to

	question she asked is not bad, sometimes even interesting and funny' (Teacher 217).			atmosphere ' (Teacher 46)		motivate students (Teacher 42).
Clear instruction	1: '[…] this teacher gave a clear explanation for the learning materials' (Teacher 217).	1: '[…] it seems that she failed to give clear explanations of the assignments for interactive activities. In addition, she did not show appropriate and clear instruction when students made mistakes and felt confused in the lesson' (Teacher 217). 2: 'This teacher did not check whether students understand knowledge. Sometimes, she did not realise that students might not understand what she said, she just focused on her own teaching	1: '[…] compared with other teachers, this teacher used more rigorous instruction in the lesson and showed a clear explanation for the learning assignment. Students can clearly and accurately understand the teachings issued by the teacher' (Teacher 16). 2: '[…] her instruction is clear, Most of the time, students can understand the lesson content' (Teacher 46).	1: '[…] the language she used is not very clear, sort of vague.' (Teacher 431). 2. '[…] sometimes, she forgot to clarify the lesson objectives at the start of the lesson and to evaluate whether the objectives have been achieved at the end of the lesson' (Teacher 428).	1: '[…] her instruction is relatively clear' (Teacher 208). 2: '[…] her instruction is clear, students clearly understand their assignments and are doing well' (Teacher 23).	

		objective' (Teacher 353).				
Activating teaching	1: 'The teacher constantly posed the questions. She timely praised students who answered questions correctly and used a very soft and gentle tone to speak with students. It is very good' (Teacher 217). 2: 'The teacher gave students sufficient time to reflect on questions and praised them in time' (Teacher 366).	1: '[…] it seems that the question she asked is useless, kind of superficial. Moreover, she did not teach students how to break down complicated problems via her questions and activities. The reason why she used different strategies seems to be that she has to rather than she wants to' (Teacher 217).	1:' […] she always captures students' ideas and gave appropriate feedback, provided well-designed assignments and interactive instructions to involve all students in the lesson'(Teacher 16). 2: '[…] she posed some interesting questions that encourage students' thinking' (Teacher 63).	1: '[…] she failed to involve all students in the lesson, it is obvious that she focused more on good learners and ignored struggling learners' (Teacher 63).	1: 'She provided well-designed assignments and interactive instructions in the lesson, and used various ways to motivate students' (Teacher 23).	1: '[…] almost one-third of students did not actively or passively involve in the lesson'(Teacher 42).
Teaching-learning strategies	'Basically, she can give some comments and tips on students' questions' (Teacher 217).	1: '[…] the quality of her feedback is not good, it cannot help students to reflect on their own answers. Sometimes, the	1: '[…] she also used different strategies to support students' self-confidence and motivate students' interest and	1: '[…] the strategies she used in the lesson are kind of useless, it failed to foster students' ability of critical	1: '[…] Her strategies are appropriate, she always captured students' ideas and gave appropriate	1: '[…] she did not use an effective teaching strategy in her lesson' (Teacher 42).

		feedback is kind of valueless' (Teacher 217). 2: '[…] she should include more teaching instruments into their teaching, such as using ICT technology' (Teacher 366).	curiosity'(Teacher 16). 2: '[…] she used some teaching strategies and interactive activities to motivate students' learning' (Teacher 63).	thinking' (Teacher 431). 2: '[…] sometimes, the strategies she used is kind of useless and valueless' (Teacher 63).	feedback' (Teacher 23). 2: '[…] sometimes, she can give appropriate feedback on students' answers' (Teacher 208).	
Adaptation of teaching	1: 'This teacher can adapt some assignments, instructions, and processing to the relevant differences between students' (Teacher 333).	1: 'This teacher ignored struggling learners and only invited good learners to answer her questions. Obviously, she did not involve all the students in her lesson'(Teacher 217). 2: 'Sometimes, she may focus more on struggling learners, and the assignment is too easy. Sometimes, it seems that the	1: '[…] moreover, she adapted the assignments and processing to the relevant differences between students and showed great concern for weak students, which is extremely important for their self-confidence' (Teacher 16). 2: '[…] she adapted the assignments and instruction to the relevant	1:'[…] she seems only to focus on good students rather than all the pupils'(Teacher 431). 2: '[…] however, she failed to offer struggling learners extra learning time and develop their confidence' (Teacher 283).	1: '[…] she was not only adapting the assignments to the relevant differences between students, moreover, she also showed great concern for weak students' (Teacher 23).	1: '[…] she ignored the importance of adaptation of teaching. I mean, sometimes, the question she posed is too difficult, sometimes is too easy' (Teacher 42).

assignment is too difficult. (Teacher 333).	differences between students' (Teacher 283).

1: Quotes have been translated from Chinese and edited for length and legibility where applicable

Appendix 5 Overview of scaled variables

Components	Example item	items	Cronbach's Alpha
Teaching quality:			
Classroom teaching	Our teacher is nice to me even when I make a mistake	14	.91
Classroom management	In our class, none of the students disturb the lesson	5	.89
Self-efficacy in teaching			
Efficacy in teaching	How much can you do to help your students value learning	7	.88
Efficacy in classroom management	How much can you do to calm a student who is disruptive or noisy	4	.88
Beliefs about learning			
Conception of student knowledge (Reproductive versus Constructive Knowledge)	It is important that students know definitions by heart, they should be able to say them in their sleep "versus "Students should understand the reasoning behind definitions; in that way they will always be able to derive the definition	4	.64
Conception of student learning ability (Fixed versus Dynamic Ability)	A student's low achievement is often caused by the student's limited ability" versus "A student's low achievement often has a cause that can be helped	5	.67

Conception of student teamwork (Individual versus Social Learning)	When students discuss the subject matter together, they will not be any wiser in the long run" versus "When students discuss together, they learn to handle different points of view and acquire deeper insight	4	.59
Conception of teacher learning ability (Fixed versus Dynamic Ability)	Good teachers are good from the start; weak teachers will always flounder" versus "Teachers are stimulated by their work towards further development	4	.67
Teacher motivation			
Autonomous motivation	I participated because I am interested in knowing more about its instructional skills	10	.94
External regulation	I participated because it was the current policy in my school	3	.83
Introjected regulation	I participated because I would feel uncomfortable if I refused to get involved	3	.62
School organizational conditions:			
Emotional pressure	Are you in your work confronted with stressful moving situations	4	.81
Task autonomy	Can you decide for yourself how you carry out your work	4	.62
Colleague support	my colleague do care how I am functioning	4	.68
Work pressure	Do you need to work extra hard to get your work done	3	.73

Transformational leadership			
Teacher educator leadership	I trust the teacher educator at his or her word	5	.90
Principal leadership	The principal at this school encourages teachers to seek and discuss new information and ideas	6	.91

Summary

Curriculum Vitae

Publications and presentations

Acknowledgements

PhD dissertation series

Summary

Teaching is important, teaching quality is considered to be of the most important predictors of students' success at schools (Scherer et al., 2016; Thoonen et al., 2011). As a consequence, teachers today are well-advised to initiate and sustain professional learning activities. However, teachers' continuous learning is not self-evident, motivation for learning is one of the most important psychological factors that determines learning behaviour of teachers (Wal, Van den Beemt, A., Martens, R. L., & Den Brok, P. J., 2016). Several studies have reported that teachers' autonomous motivation to learn is a basic condition for teacher learning performance and professional development(Shulman & Shulman, 2009). However, in practical terms, teachers differ in their motivations for learning. Some teachers may implement professional learning activities with considerable energy and persistence, whereas others are reluctant to participate. In this research project, we focus on a specific professional development programme, the NBE. The purpose of NBE is to provide professional development for Chinese teachers in primary schools, and they are encouraged to develop a new pedagogy that fosters students' active learning and critical thinking abilities and improve their teaching quality (Yuhua & Jiacheng, 2013). This research project intends to explore the effects of NBE on teaching quality after a period of time. And try to relate teaching quality to their learning motivation in the NBE. Finally, to better stimulate teachers' learning motivation and improve their learning performance, there is a need to explore the factors which are important for teachers' learning motivation. Understanding these questions could offer insights to policy-makers and practitioners in teacher education regarding how to improve their motivation and teaching quality. The research project that comprise studies are reported in Chapters 2-5. An outline of each study is described below.

In Chapter 2, we first explore how students and supervisors evaluate teaching quality, the following research questions as addressed: *1. What is the relationship between supervisors' and students' evaluations of instructional quality? 2. What are the evaluation criteria used by supervisors and students?* To answer these questions, 20 teachers from 12 primary schools in Shanghai participated in this project and then the quality of their teaching was awarded by 10 supervisors and 497 students. Mix methods were used to explore students' and supervisors' evaluations of teaching .

Our results indicate that students were more positive than supervisors. Students rated most of their teachers as good quality instructors, whereas supervisors held the opinion that the majority of teachers had a relatively low level. Our result also indicated that students and supervisors use different quality criteria, and focus on different aspects of instructional quality. It was concluded that the scores of the evaluation of instructional quality will differ substantially depending on which method is used.

In Chapter 3, we explore the effect of NBE on teachers' teaching, the following research questions as addressed: *1. Do teachers improve their teaching quality as evaluated by their students during participation in the NBE program? 2. How are teacher characteristics, school working conditions and principal's transformational leadership related to the changes in teaching quality?* To answer these questions, two waves of questionnaire data were collected. The first questionnaire (T1) was administered in October 2017, and the second (T2) in April 2018. 375 teachers from 12 primary schools in Shanghai who were active in the PD program participated in this study. A paired-samples t-test was carried out for two teaching quality scales together at two different times to test whether the change was significant. Then stepwise regression analyses were performed to assess the relationship between teacher personal factors, working conditions and principal transformational leadership, on the one hand, and changes in teaching quality, on the other hand.

Results of regression analyses indicate that teachers generally receive higher scores on teaching quality after the program than before. Three factors are significantly and negatively related to the changes in quality: teachers' educational level, the extent to which teachers feel emotional pressure in their profession, and the support from their school principal. Implications for school leaders and policymakers are discussed.

In Chapter 4, we focus on the relationship between teachers' learning motivation and learning performance. The study aimed to explore the impact of teachers' learning motivation, as well as other personal and environmental factors on teaching practices. It sought for the answer to this question: *1. How are working conditions, school leadership, and teacher psychology factors related to students' perceptions of teaching? 2. Do teacher psychology factors mediate the relationship between working conditions, principal leadership, and students' perceptions of teaching?* To answer these questions, 419 teachers and 11705 students from 12 primary schools in Shanghai were chosen randomly in this study. Structural equation modelling was

performed to explore the relationship between teachers' personal factors, working conditions and teaching quality.

The results indicate that self-efficacy seemed to be a powerful predictor for teaching practices. Support from colleagues, task autonomy, the leadership from the principal and academic supervisor also affected teachers' instruction via teachers' self-efficacy. This study shed light on Chinese teaching quality in relation to their background characteristics, personal factors, as well as environmental factors.

In Chapter 5, we conduct a study of the relationship between teachers' self-efficacy, beliefs about learning and their perceived work, and their learning motivation. The study aimed to answer the research question: *"How are factors at the personal and school levels related to teachers' motivation to participate in professional learning?"* To answer these questions, data were collected using a paper-and-pencil questionnaire. Participants included 472 teachers (90.1% females, 9.9% males) from 12 primary schools in Shanghai, China. Multivariance analyses of variance were performed with teacher characteristics and environmental factors as independent variables and the three motivation scales as dependent variables.

Results indicate that teachers' prior experience, self-efficacy in teaching, the conception of students' ability and their own ability (Fixed versus Dynamic Ability), emotional pressure and principal leadership are significantly positively related to teacher autonomous motivation for learning. And teacher conception of students' ability (Fixed versus Dynamic Ability), emotional pressure, and principal leadership showed a significant negative relationship with external regulation. Finally, only efficacy in teaching showed a significant positive relationship with introjected regulation.

In Chapter 6, we investigate the relationship between workplace conditions in schools and teachers' autonomous motivation to learn. The following research questions directed our study:*1. Which workplace conditions are related to teachers' autonomous motivation to learn? 2: Which workplace conditions moderate the relationship between teachers' characteristics and their autonomous motivation to learn?* To answer these questions, a questionnaire was completed by 472 teachers from 13 primary schools in Shanghai. Multilevel regression analyses were performed with factors at level 1 and 2 as predictors of teachers' autonomous motivation.

The results indicate that perceived support from colleagues had a positive effect and perceived work pressure had a negative effect on teachers' autonomous motivation to learn. In addition, these two variables moderated the relationship between teaching experience and their task autonomy, on the one hand, and their autonomous motivation to learn, on the other hand, with stronger relationships with high collegial support and low work pressure. These findings can have implications for school leaders and policymakers to implement strategies that foster teacher learning motivation.

In Chapter 7, we provide summaries of the four studies, reflections, and the findings and discussions of each study. Additionally, practical implications and suggestions for further studies were also discussed.

First, unlike our expectations, our results indicate that teachers' learning motivation and their teaching quality are not interrelated. These findings were unexpected in the light of previous studies in the Western culture setting (Gan et al., 2018; Georgios Gorozidis & Papaioannou, 2014; Lam et al., 2010; Thoonen et al., 2011). One possible explanation could be explained by the cultural difference between Western countries and Eastern countries. The culture of Eastern countries places more emphasis on collectivism rather than individualism (Ho & Chiu, 1994). We presumed Chinese teachers place more emphasis on collectivism, they may be reluctant to offer straight and negative information about their learning motivation when they are pressed to participate in learning activities.

Second, we find that teachers' prior experience with learning activities, teaching experience, self-efficacy, conceptions of learning, work and emotional pressure, colleague support and principal leadership were all related to their motivation to participate in professional learning. In addition, colleague support and task autonomy moderated the relationship between teaching experience, and self-efficacy in classroom teaching, on the one hand, and their autonomous motivation to learn, on the other hand. This means that teachers' personal experiences and institutional and socio-cultural contexts can both influence learning motivation in professional learning activities (see.e.g., Gan et al., 2018; Kwakman, 2003; W. Liu et al., 2018). Furthermore, it indicates that the relationship between teachers' characteristics and their learning motivation may vary across different workplaces with different conditions.

Third, we provide several practical implications for teacher professional learning

in schools. We presumed that policymakers should involve teachers' working conditions, and individual needs in setting the agenda for professional development programmes and provide individual and intellectual support within a safe learning climate. At the same time, it is not only policymakers who can improve the effectiveness of professional development programmes, but also teachers themselves, it is important for teachers to know that they could be beneficial for the overall learning activities. These measures may eventually lead to PD that are able to stimulate teachers' learning motivation and improve the quality of teaching.

摘要

教师是极其重要的，教师的教学质量直接关系到学生的未来的发展 (Scherer et al., 2016; Thoonen et al., 2011). 因此，教师需要不断参加各种专业发展的活动从而持续的提高自己的教学质量。但是教师持续得学习并不总是自动自发的，学习动机是决定学习成效的关键，尤其是教师的自主性动机是高质量的学习行为的重要前提条件 (Wal, Van den Beemt, A., Martens, R. L., & Den Brok, P. J., 2016)。然而实际中，不同教师学习动机各不相同，有的教师会以极大的热情去参加各种专业培训活动，但是有的老师并不愿意参加此类活动。为了更好的激发教师的参加此类活动的动机，本文聚焦于由中国华东师范大学组织开展的一种教育改革活动 —— 新基础教育，研究了教师参加新基础教育的学习动机，探索了新基础教育对于教师教学活动的影响，并尝试找出教师学习动机与教师最后的学习成果之间的关系。探索这些问题有助于教育培训组织者认识到不同教师所持有的不同动机之间的差异性，其次对不同动机的教师采取不同的针对措施，激发其学习的热情，从而最终促进教师专业发展。本论文主要包括章节 2-5，如下：

章节 2 主要探索了新基础教育的专家和学校学生对于教师的教学是如何认知的，问题如下：1 专家和学生对于学校教师的教学的认知是否存在关系？2 他们对于教学质量的评价标准分别是什么？为了回答这一问题，我们以上海 12 所小学 20 名教师为研究对象，邀请了 10 新基础教育的专家和 497 名小学生对其进行评价，并对最后的评分进行了比较。我们的研究结果表明总体而言，相较于专家，学生的评价更为积极。而且他们的评价标准也各不相同，学生更加注重教学氛围创设，而专家更加注重教学策略的运用。

章节 3 探索了新基础教育对于教师教学的影响，问题如下：1 在参加了新基础教育 6 个月以后，教师的教学是否得到了提高？ 2 如果得到了提高，是什么因素促进了这种提高？为了回答这一问题，我们以上海 375 来中小学的教师为研究对象，分两次（间隔半年）邀请了他们所教授的学生对他们的教学进行了评价。评价结果表示教师的教学质量的确得到了一定程度的提升。教师的自我受教育水平，所感知的情感压力和校长领导力对于教师教学质量提升具有较大的影响。

章节 4 主要探索了动机以及其他因素和教育质量之间的关系，问题如下：1 教师的学习动机，校长领导力，学校环境和教师个人特质与教学质量的关系？ 2 教师的个人特质是否对学校环境，校长领导力和教学质量的关系具有中介作用？为了探究此问题，我们邀请了 419 位老师和 11705 学生参加本次研究，研究结果表明教师的学习动机与教学质量并不存在显著的关系，但是教师的教学效能对于教师的教学质量影响较大。

章节 5 主要研究了教师的动机以及相关影响因素，问题如下：教师的个人特质和学校环境是如何影响教师的学习动机？ 472 名教师参加本次研究。研究结果表明教师之前的学习经验，自我效能，学习观念，情感压力和校长领导力对于教师的学习动机有显著的影响。

章节 6 主要研究了学校的工作环境是如何通过教师的个人特质调节了教师的自主学习动机，问题如下：1 哪些工作环境特征与教师自主学习动机相关？ 2：哪些工作环境特征调节了教师特质和自主学习动机之间的关系。有 472 名教师参加了本次研究。研究结果表明了同事之间的帮助和工作压力对于教师自主性学习动机起着主要的调节作用。

章节 7 主要总结了之前四个章节的内容，对内容进行了讨论与反思，并对未来的研究提供了启示和建议：

首先，与我们预期不符的是，结果表明教师的学习动机与教学质量之间并不相关，此项结果也与之前许多西方的研究不符 (Gan et al., 2018; Georgios Gorozidis & Papaioannou, 2014; Lam et al., 2010; Thoonen et al., 2011)。原因有可能是西方和东方文化差异导致的，比如说东方文化更加强调集体主义而不是个人主义 (Ho & Chiu, 1994)。

其次，我们不但发现了教师的教龄，自我效能，学习观念，工作和情感压力，同事的帮助和校长领导力与教师学习动机之间紧密的联系，而且发现了对于教师来说，来自同事之间的帮助和工作自主性对于教师自主性动机具有显著的调节作用。此项结果表明，不仅教师的个人特质而且教师工作的环境也对教师的动机具有十分重要的影响。

再次，我们基于研究结果，为教育研究人员提供了若干的建议，比如我们认为教学活动的制定者要根据教师的需求制定更加灵活的学习策略，同时学校的领导者也要创建一个合适学习的学习氛围，从而更好的激发教师的学习动机。

Curriculum Vitae

Xin Zhang was born on July 3th, 1990 in Jiangsu province and grew up in Ningbo city, China. After finishing secondary education at Siming High School in 2008, he started his higher education and finished his Bachelor's Degree in Tourism Management at Zhejiang Normal University in 2013. In 2016, he earned his Master Degree in Adult Education at East China Normal University. In that same year, he received a scholarship from the China Scholarship Council (CSC) and started his PhD study at ICLON, Leiden University. In his doctoral research, he examined the relationship between teachers' teaching and learning motivation in a Chinese context. During his PhD study, he attended courses and master classes in his research topic provided by ICO, the Dutch Interuniversity Centre for Educational Sciences, as well as several international conferences.

Publications and presentations

Articles in peer-reviewed journals

Zhang, X., Admiraal, W. & Saab, N. (2020). University-school partnership in China: Teachers' personal factors, working conditions, and principal leadership that explain their development in teaching. *Frontiers of Education in China*, 15, 621-646. doi: 10.1007/s11516-020-0029-1.

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Zhang, X., Admiraal, W. & Saab, N. (Under Review). Students' and supervisors' evaluations of teaching in primary education. Manuscript submitted for publication.

Conference contributions

Zhang, X., Admiraal, W. & Saab, N. (2020, Apr 17 - 21) *Different Perspectives on Instruction: The Comparison of Perceptions From Instructional Supervisors and Students* [Paper Session]. AERA Annual Meeting San Francisco, CA http://tinyurl.com/r4wtbmp

Zhang, X., Admiraal, W. & Saab, N. (2020, Apr 17 - 21) *Chinese Principals' Dilemmas in the Teachers to Further Develop Teaching Quality* [Paper Session]. AERA Annual Meeting San Francisco, CA http://tinyurl.com/rml67md

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I thought that when I am done with my thesis, my life would be better, but it is not. However, would I not do it if I had my time again? No way. The PhD journey is long, hard, wonderful, and exciting.

Much like whom I want to begin with, my PhD is also a matter of choice to begin with. Firstly, it seduces me with promises of a doctor before my name, instant respect, good reputation, or maybe an upgrade on a flight. After a tough study, I finally realized that the reason why I want to do a PhD research is that I want to find something which is special, valuable, and meaningful not just for the examiners, but to the community at large. I want my words to be heard.

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