How Should We Develop Primary Teachers in Online Classrooms? Correlation Between Teaching Methods, Teaching Motivation, Educational Background and Teaching Experience

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ARTICLE INFO	ABSTRACT

Purpose: This research aimed to improve the teaching quality of online classrooms and further enhance the performance of primary school teachers in online classrooms. **Method:** A survey was conducted on the teaching methods, teaching motivation, educational background, and teaching experience with a sample of 515 primary school teachers in online classrooms in China. Correlation analysis (Spearman's correlation coefficient) was used as the analysis process.

Findings: (1) Teaching experience and educational background are positively correlated with most teaching methods. Some correlations are reflected in the use of teaching methods, while others are reflected in the mastery of teaching methods; (2) Teaching experience and educational background are positively correlated with most aspects of teaching motivation, focusing on competence and autonomy. But no positive correlation was found between educational background & teaching experience, respectively, and relatedness; (3) There is a strong positive correlation between teaching methods and teaching motivation, mainly focusing on competence and autonomy, while they don't have positive correlation in terms of relatedness. **Implications for Research and practice:** This study links educational psychology and teaching by studying teaching motivation and teaching methods, verifying the interrelationships among various dimensions of teachers in online classrooms, which has value and significance for subsequent research. The study recommends the improvement of teachers' educational background and teaching experience meaningfully, which will help them improve their teaching methods and teaching motivation in online classrooms.

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Introduction

Online education is defined as education being delivered in an online environment through the use of the internet for teaching and learning (Singh & Thurman, 2019). This includes online learning on the part of the students that is not dependent on their physical or virtual co-location. The teaching content is delivered online and the instructors develop teaching modules that enhance learning and interactivity in the synchronous or asynchronous environment. Online classroom is also a form of education that has developed rapidly in recent years and is unique in that it uses the Internet to teach at a distance. It can save cost and time (McCready, 2017), promote educational equity (Chen, 2020), introduce flexible and personalized teaching & learning (Zhang & Ai, 2021).

There are several challenges in online classrooms. Mukhtar et al. (2020) found that many teachers and students frequently complain about problems such as the inability to teach skills, limited attention span, lack of attentiveness, and resource-intensive requirements. A large-scale survey conducted by Yang et al. (2020) revealed that an astonishing 38% of primary school pupils believe that they do not have any interaction opportunities in online classes. In contrast, only 9% of students prefer online classes when compared to traditional face-to-face teaching. Only 11% of primary school students hope that online teaching will continue, a figure considerably lower than that of their secondary school counterparts. The problems of online classrooms not only plague students, but also affect teachers.

The problems in online classrooms mainly arise in the fields of teaching methods and teaching motivation. Analyzing which factors are related to teachers' teaching motivation in online classrooms, it was further found that educational background and teaching experience of teachers have always been two important and quantifiable evaluation criteria for teachers. However, there is currently limited research in these factors in the context of online classrooms in Chinese primary schools. Hence, the current research aimed to fill this research gap and conduct further research in resolving issues related to online classrooms. This objective was achieved by conducting a correlation between teaching methods, teaching motivation, educational background and teaching experience.

Literature Review and Theoretical Framework

Du and Ding (2020) found that teachers and students are faced with "cold" cameras, which cannot accurately convey expression and emotion. This is because the spatial distance inherent in online classrooms diminishes the efficiency of teacher-student interaction (Li, 2020). Li (2021a) discovered that more than half of the educators believed that the frequency and effectiveness of online classes' interactions were lower than those of face-to-face classes. Xiao (2021) found that in online classrooms, teachers have certain problems and a tendency to blur their roles, which may be caused by various problems in online interaction. Meanwhile, the teaching method is an interactive means and a set of working methods adopted by teachers and students to achieve teaching objectives and complete teaching tasks (Shen, 1991). Therefore, it is reasonable and meaningful to study the teaching methods of teachers in order to solve the interaction problem in online classrooms.

Li and Zhu (2020) found that online teaching has had a serious impact on the mental health of teachers, including a sense of unfamiliarity with the new teaching mode, a sense of loss of control for students, and conflicts between family affairs and online education, all of which increase psychological pressure. Many K12 school teachers have low enthusiasm and motivation for online teaching (Xu, 2021). These studies indicate that there may be some issues with the teaching motivation of teachers in the current online classroom. In addition, teaching experience is a factor that helps faculty to understand the content of the discipline and the content of teaching, and helps faculty to conduct scholarly research (Li, 2021b). The study by Kini and Podolsky (2016) found that teaching experience not only improves teachers' effectiveness, but it also increases at a greater rate when gained at the same grade level, subject, or area. Furthermore, teaching experience is positively correlated with student achievement. Teaching experience has been proven to be relevant to quite a few things, but its relationship with teaching methods and teaching motivation has not yet been analyzed through any research.

The third factor, educational background, generally refers to the level of education received, including academic qualification (Liu, 2016). One's educational background can include both formal education and any informal or continuing education one have received throughout one's lifetime (Birt, 2023). The educational background of teachers has been found to play an important role in teaching. For example, Isikoglu et al. (2009), found that teachers' educational background, school level, teaching experience, and other characteristics had a significant impact on their beliefs about 'student-centered' education. Currently, there has been no research to identify and analyze the relationship between educational background, teaching motivation, and teaching methods.

Finally, teaching methods and motivation factors are closely related to teaching and learning activities, respectively. Zhang (2012) found that there is a strong relationship between teachers' work motivation, creative teaching effectiveness, and creative teaching behavior. Chen et al. (2021) built a model that combined many kinds of advantageous teaching methods, including case study, experiment study, scientific research discussion, and so on. It was found that this approach not only stimulates students' interest in studying and scientific research but also effectively guides them to overcome bad habits such as indulging in online games and skipping classes. This can actively promote the cultivation of comprehensive and creative talents. From these two studies, it can be seen that teachers' teaching motivation and teaching methods are closely related to teaching and learning activities. Is there a certain connection between teaching motivation and teaching methods? This is one of the questions addressed by our research.

To understand this debate, a theoretical framework was attempted for this study attempting to find a correlation between all the variables of the study, namely teaching methods, teaching motivation, educational background and teaching experience.

Teaching Methods

In this study, teaching method theory was adopted. To understand its application, specifically this study examin following 10 teaching methods namely, Lecture, Conversation, Discussion, Reading guidance, Demonstration, Visit & Observation, Practice, Experimentation, Appreciation & Edification, and Discovery. This is significant because in China, Li, Li & Tian's

teaching method theory (2001) is the most popular and widely adopted theory. This theory is also the content of the teacher qualification certificate examination organized by the Chinese Ministry of Education, which is the most important teaching method theory introduced in relevant textbooks. All Chinese teachers know them and use them.

Teaching Motivation

Teaching motivation is an internal force that can inspire teachers to fulfil their teaching duties (Lv, 2016). At present, research on motivation in the field of education mostly focuses on the learning motivation of students, rather than the teaching motivation of teachers. Moreover, there is no specific theory to analyze teaching motivation. In this study, researchers used Ryan & Deci's self-determination theory (2000) to verify the relevant variables of teaching motivation, advocating that motivation is driven by the following three variables: (i) Competence: control the outcome and experience mastery; (ii) Autonomy: be causal agents of one's own life and act in harmony with one's integrated self; and (iii) Relatedness: interact with, be connected to, and experience caring for others

In current educational practice, most schools divide educational work into curriculum, teaching, and assessment. There is currently not much research to discuss this classification in detail, and whatever limited studies are available, they focus on restricted subjects. For example, when studying high school English education in Hong Kong, Jin (2011) analyzed and explained relevant educational issues from the perspectives of curriculum, teaching, and assessment, clarifying basic concepts and value orientations. Song et al. (2017) also took curriculum, teaching, and assessment as the perspectives to discuss related issues when analyzing STEM education in the United States. These studies have specifically investigated the situations of Competence and Autonomy in curriculum, teaching, and assessment in the questionnaire.

However, because, in many times, the fact that relatedness generally involves specific relationships with a particular group, such as students, colleagues, or parents, no studies have discussed this aspect. Hence, the current study examined segmentation when investigating relatedness as seen in the questionnaire presented in Table 1.

Teaching Experience

Li and Gao (2010) examined the aspects of teaching experience from two viewpoints. They concluded that teaching experience is an understanding and action pattern established by individual teachers throughout their educational life. It is a process of continuous reflection, realization and generation through learning, communication and practice in their daily teaching and life. Generally speaking, the most commonly used standard for measuring teaching experience is the time that teachers participate in teaching, usually calculated on an annual basis. Li and Ding (2012) investigated the career development path of experienced teachers. In the process of selecting samples, they used the standard of teaching time exceeding 10 years to identify "experienced teachers". Meanwhile, researchers believe that the number of grades taught by the teacher can be used as a sub-variable for research. At present, there is no research on the number of grades taught by the teacher, but in practice, this is often mentioned in primary school teaching and management. Hence, the current study included analyzing and validating the relationship between the number of grades taught by the teacher and other variables in this study, which would open up a new research field.

Educational Background

Educational background, generally refers to the level of education received, including academic qualification (Liu, 2016). Meanwhile, in the field of education, especially in research on the educational background of learners, learning time is usually included. For example, Wan (2015) analyzed both their educational background and learning time when he surveyed the athletes from the National Training Team of the Olympic Sports Center. Liu (2019) found that if a teacher's educational background is low, including short learning time and low academic qualification, it will affect their TPACK (Technological Pedagogical Content Knowledge) level. After considering many previous studies, the current study also ultimately included the academic qualification and the total learning time as educational background in this study.

To sum up, the current study has attempted to verify the relationship between teaching methods, teaching motivation, educational background, and teaching experience of primary school teachers in online classrooms, in the hope of having a positive influence and value on future research. The specific research questions for this study are stated as follows:

RQ1: What is the relationship between teaching experience and teaching methods in online classroom among primary school teachers in China?

RQ2: What is the relationship between educational background and teaching methods in online classroom among primary school teachers in China?

RQ3: What is the relationship between teaching experience and teaching motivation in online classroom among primary school teachers in China?

RQ4: What is the relationship between educational background and teaching motivation in online classroom among primary school teachers in China?

RQ5: What is the relationship between teaching methods and teaching motivation in online classroom among primary school teachers in China?

Methodology

Research Design

The study used a quantitative, experimental research design with a view to conduct a correlation study of variables related to primary teachers' competencies in teaching online classrooms. The variables included teaching methods, teaching motivation, educational background and teaching experience. These variables were chosen based on a documentation review and theoretical analysis of these concepts.

Research Instruments

This study utilized a questionnaire to collect the data. The questionnaire comprising closed-ended questions, collected data on various aspects of the participants: Basic Information, Educational Background, Teaching Experience, Teaching Methods and Teaching Motivation. A 5-point Likert Scale was used to measure the responses of the questions. The reliability and validity were also determined for each item in the questionnaire, along with the theoretical and practical significance of each item. Table 1 illustrates the questionnaire construction.

Table 1

Construction of Questionnaire

Aspects	Sub-Variable	Questionnaire Items
Basic Information: Educational Background & Teaching Experience	Educational Background	1. My educational background: A. Associate Bachelor and below B. Bachelor C. Master D. Doctor
		2. Learning years: _____ years
	Teaching Experience	3. My teaching experience: _____ years
		4. How many of the six grades in primary school have I taught? __
	Others	5. What is my learning major in university? _____
		6. Is it about education? A. Yes B. No
Teaching Methods	Lecture	7. I use the Lecture in online classrooms
		8. My proficiency in the Lecture in online classrooms
	Conversation	9. I use Conversations in online classrooms
		10. My proficiency in Conversation in online classrooms
	Discussion	11. I use Discussion in online classrooms
		12. My proficiency in Discussion in online classrooms
	Reading Guidance	13. I use Reading guidance in online classrooms
		14. My proficiency in Reading guidance in online classrooms
	Demonstration	15. I use Demonstration in online classrooms
		16. My proficiency in Demonstration in online classrooms
	Visit & Observation	17. I use Visit and Observation in online classrooms
		18. My proficiency in Visit and Observation in online classrooms
	Practice	19. I use Practice in online classrooms. 20. My proficiency in Practice in online classrooms
	Experimentation	21. I use Experimentation in online classrooms
		22. My proficiency in Experimentation in online classrooms
	Appreciation & Edification	23. I use Appreciation & Edification in online classrooms Appreciation & Edification: Cultivate students' good characters by experiencing and appreciating the beauty of a thing)
		24. My proficiency in Appreciation & Edification in online classrooms
	Discovery	25. I use Discovery in online classrooms. 26. My proficiency in Discovery in online classrooms
Teaching Motivation	Competence	27. My competence in course design in online classrooms
		28. My competence in teaching in online classrooms
		29. My competence in assessment in online classrooms (assessment for students)
	Autonomy	30. My autonomy in the course design in online classrooms
		31. My autonomy in teaching in online classrooms
		32. My autonomy in the assessment in online classrooms (assessment for students)
	Relatedness	33. My relatedness to other colleagues in online classrooms
		34. My relatedness to students in online classrooms. 35. My relatedness to parents in online classrooms

Sampling

The participants in this study comprised teachers from primary schools across China. Questionnaire were distributed through emails and social media. The WJX, a professional online survey platform in China, was also used for data collection. After discarding invalid copies, the researchers acquired 515 valid copies.

Data Analysis

The data was analyzed through WJX, which enabled editing, distribution and collection of questionnaires. After having sorted the data according to the variables, reliability and validity of all items were assessed. The Cronbach measured the validity of samples while KMO and Bartlett tests were performed for descriptive statistics. Finally, a correlation analysis was performed with Spearman's correlation coefficient technique.

Results

Right at the outset, the academic qualification and experience of the participants were tabulated. Table 2 presents the summary of this information.

Table 2

Academic Qualifications and Experience of Teachers

Category	Frequency (n=515)	Percentage
Academic Qualifications		
Associate Bachelor and below	189	36.7
Bachelor	239	46.4
Master	61	11.8
Doctor	26	5.0
Total	515	100.0
Total learning time (years)		
0 -5 years	420	82
6-10 years	90	17
11-20 years	5	1
Total	515	100.0
Teaching experience (in years)		
1-5 years	195	38
6-10 years	179	34
11-20 years	141	28
Total	515	100.0
Grades taught		
1	41	8.0
2	63	12.2
3	76	14.8
4	93	18.1
5	115	22.3
6	127	24.7
Total	515	100.0

Reliability and Validity

As presented in Table 3, the Cronbach's α is shown as 0.930 (>0.7), which indicates that the reliability of the data is high.

Table 3

The Reliability of Samples

Cronbach for Reliability		
Items	Samples	Cronbach α
107	515	0.930

Table 4 presents the KMO value which is 0.820 (>0.7) and the p-value is 0.000 (<0.05). This shows that the validity of the research data is very suitable for research.

Table 4

The Validity of Samples

KMO and Bartlett		
KMO		0.820
Bartlett's Test of Sphericity	Approx. Chi-Square	37163.532
	df	5671
	P-value	0.000

Correlation analysis: Spearman's correlation coefficient

In statistics, correlation represents a statistical relationship, irrespective of causation, between two random variables or bivariate data. A correlation coefficient's ultimate value varies between -1 and +1. The correlation coefficient is +1 in situations demonstrating perfect direct (increasing) linear relationship (correlation) and -1 in the case of an absolute inverse (decreasing) linear relationship (anti-correlation) (Gupta, 2023).

The Relationship Between Teaching Experience and Teaching Methods in Online Classroom

Spearman's Rank Correlation Coefficient technique was used because the final data of this study was in a non-normal distribution. The findings are presented in four sections corresponding to each variable viz., total teaching time of the teachers VS the use of teaching methods, total teaching time of the teachers VS the mastery of teaching methods; number of grades taught by the teacher VS the use of teaching methods; and number of grades taught by the teacher VS the mastery of teaching methods

1. Table 5 depicts the total teaching time of the teachers VS the use of teaching methods

It is evident that the teaching methods have positive correlation with the total teaching time of the teachers including their use of Lecture, use of Reading guidance, use of Practice, and use of Appreciation & Edification.

Table 5

The Spearman's Correlation Coefficient

		Q5	Q7	Q9	Q11	Q13	Q15	Q17	Q19	Q21	Q23
	Correlation Value	0.154**	-0.008	-0.026	0.183**	0.064	0.085	0.143**	0.013	0.251**	0.020
Q3	P-Value	0.000	0.859	0.551	0.000	0.149	0.053	0.001	0.765	0.000	0.648
	Sample (n)	515	515	515	515	515	515	515	515	515	515

2. *Table 6 depicts the total teaching time of the teachers VS the mastery of teaching methods*

It shows that teaching methods have positive correlation with the total teaching time of the teachers including mastery of Lecture, mastery of Discussion, mastery of Visit & Observation, mastery of Practice, mastery of Experimentation, and mastery of Discovery

Table 6

The Spearman's Correlation Coefficient

		Q6	Q8	Q10	Q12	Q14	Q16	Q18	Q20	Q22	Q24
	Correlation Value	0.211**	0.079	0.181**	0.072	0.044	0.262**	0.166**	0.090*	0.076	0.095*
Q3	P-Value	0.000	0.074	0.000	0.100	0.316	0.000	0.000	0.042	0.083	0.031
	Samples	515	515	515	515	515	515	515	515	515	515

* p<0.05 ** p<0.01

3. *Table 7 presents the number of grades taught by the teacher VS the use of teaching methods*

It is evident of the fact that teaching methods have positive correlation with the number of grades taught by the teacher including use of Lecture, use of Reading guidance, use of Demonstration, use of Visit & Observation, use of Practice, use of Appreciation & Edification, and use of Discovery

Table 7

The Spearman's Correlation Coefficient

		Q5	Q7	Q9	Q11	Q13	Q15	Q17	Q19	Q21	Q23
	Correlation Value	0.100*	0.059	0.033	0.169**	0.102*	0.106*	0.161**	0.064	0.161**	0.090*
Q4	P-Value	0.023	0.179	0.459	0.000	0.020	0.016	0.000	0.144	0.000	0.041
	Samples	515	515	515	515	515	515	515	515	515	515

4. *Table 8 presents the number of grades taught by the teacher VS the mastery of teaching methods*

It reveals that the teaching methods have positive correlation with the number of grades taught by the teacher including mastery of Lecture, mastery of Conversation, mastery of Discussion, mastery of Reading guidance, mastery of Visiting & Observation, and mastery of Practice.

Table 8

The Spearman's Correlation Coefficient

		Q6	Q8	Q10	Q12	Q14	Q16	Q18	Q20	Q22	Q24
	Correlation Value	0.169**	0.129**	0.113*	0.205**	0.084	0.249**	0.152**	0.033	0.083	0.080
Q4	p-value	0.000	0.003	0.010	0.000	0.057	0.000	0.001	0.452	0.061	0.070
	Sample (n)	515	515	515	515	515	515	515	515	515	515

The Relationship Between Educational Background and Teaching Methods in Online Classroom Among Primary School Teachers in China?

The next step was to assess the between educational background and teaching methods in online classroom among primary school teachers in China

1. *Table 9 presents the academic qualification of the teacher VS the use of teaching methods*

It shows the teaching methods have positive correlation with the academic qualification of the teachers including the use of Lecture, use of Discussion, use of Reading guidance, use of Visit & Observations, use of Practice, use of Experimentation, use of Appreciation & Edification, and use of Discovery

Table 9

The Spearman's Correlation Coefficient

		Q5	Q7	Q9	Q11	Q13	Q15	Q17	Q19	Q21	Q23
	Correlation Value	0.147**	0.057	0.087*	0.105*	-0.002	0.124**	0.123**	0.134**	0.089*	0.143**
Q2	P-Value	0.001	0.198	0.050	0.017	0.960	0.005	0.005	0.002	0.045	0.001
	Sample(N)	515	515	515	515	515	515	515	515	515	515

* p<0.05 ** p<0.01

2. *Table 10 presents the academic qualification of the teacher VS the mastery of teaching methods*

It shows the teaching methods have positive correlation with the academic qualification of the teachers and includes the mastery of Lecture, mastery of Conversation, mastery of Discussion, mastery of Demonstration, mastery of Practice, and mastery of Discovery

Table 10

The Spearman's Correlation Coefficient

		Q6	Q8	Q10	Q12	Q14	Q16	Q18	Q20	Q22	Q24
	Correlation Value	0.104*	0.165**	0.100*	-0.067	0.136**	0.070	0.100*	0.086	0.036	0.095*
Q2	P-Value	0.018	0.000	0.023	0.128	0.002	0.114	0.023	0.052	0.413	0.030
	Sample (N)	515	515	515	515	515	515	515	515	515	515

* p<0.05 ** p<0.01

3. *Table 11 presents total learning time of the teacher VS the use of teaching methods*

It summarizes that teaching methods have positive correlation with the total learning time of the teacher including the use of Lecture, use of Demonstration, and use of Discovery

Table 11

The Spearman's Correlation Coefficient

		Q5	Q7	Q9	Q11	Q13	Q15	Q17	Q19	Q21	Q23
	Correlation Value	0.115**	0.011	0.005	0.021	0.154**	0.029	0.015	0.051	0.056	0.140**
Q2.1	P-Value	0.009	0.812	0.902	0.630	0.000	0.517	0.740	0.251	0.201	0.001
	Sample (N)	515	515	515	515	515	515	515	515	515	515

* P<0.05 ** P<0.01

4. *Table 12 depicts the total learning time of the teacher VS the mastery of teaching methods*

This shows that the teaching methods have positive correlation with the total learning time of the teacher including the mastery of Conversation, mastery of Discussion, and mastery of Discovery. The negative correlation is seen only in Reading guidance.

Table 12

The Spearman's Correlation Coefficient

		Q6	Q8	Q10	Q12	Q14	Q16	Q18	Q20	Q22	Q24
	Correlation Value	0.086	0.126**	0.138**	-0.149**	0.070	0.036	-0.021	0.059	0.035	0.100*
Q2	P-Value	0.050	0.004	0.002	0.001	0.112	0.412	0.628	0.178	0.431	0.023
	Sample (N)	515	515	515	515	515	515	515	515	515	515

Relationship Between Teaching Experience and Teaching Motivation in Online Classroom Among Primary School Teachers in China

The teaching motivations have positive correlation with the total teaching time of the teacher. This includes Competence in course design, Competence in teaching, Competence in assessment, Autonomy in the course design, Autonomy in teaching, and Autonomy in the assessment. Table 13 presents the findings in these relationships.

Table 13

The Spearman's Correlation Coefficient

		Q25	Q26	Q27	Q28	Q29	Q30	Q31	Q32	Q33
	correlation value	0.129**	0.150**	0.247**	0.125**	0.205**	0.199**	0.029	-0.035	-0.078
Q3	p-value	0.003	0.001	0.000	0.004	0.000	0.000	0.507	0.422	0.077
	Sample (n)	515	515	515	515	515	515	515	515	515

Table 14 presents that teaching motivations have positive correlation with the number of grades taught. This includes Competence in course design, Competence in teaching, Competence in assessment, Autonomy in the course design, Autonomy in teaching, and Autonomy in the assessment

Table 14

The Spearman's Correlation Coefficient

		Q25	Q26	Q27	Q28	Q29	Q30	Q31	Q32	Q33
	Correlation Value	0.187**	0.146**	0.218**	0.138**	0.229**	0.198**	0.055	-0.029	-0.041
Q4	p-value	0.000	0.001	0.000	0.002	0.000	0.000	0.217	0.516	0.348
	Sample (n)	515	515	515	515	515	515	515	515	515

The relationship between educational background and teaching motivation in online classroom among primary school teachers in China?

The results also revealed that teaching motivations have positive correlation with the academic qualification of the teacher. This includes Competence in course design, Competence in teaching, Competence in assessment, Autonomy in the course design, Autonomy in teaching, and Autonomy in the assessment. The only negative correlation was seen in relatedness to other colleagues. Table 15 presents these findings.

Table 15

The Spearman's Correlation Coefficient

		Q25	Q26	Q27	Q28	Q29	Q30	Q31	Q32	Q33
	Correlation Value	0.200**	0.140**	0.198**	0.161**	0.127**	0.120**	-0.124**	-0.028	0.014
Q2	p-value	0.000	0.001	0.000	0.000	0.004	0.006	0.005	0.520	0.746
	Sample (n)	515	515	515	515	515	515	515	515	515

Table 16 depicts that teaching motivations have positive correlation with the total learning time of the teacher. This includes Competence in course design, Competence in teaching, Competence in assessment, Autonomy in the course design, Autonomy in teaching, Autonomy in the assessment, and Relatedness to students.

Table 16

The Spearman's Correlation Coefficient

		Q25	Q26	Q27	Q28	Q29	Q30	Q31	Q32	Q33
	Correlation Value	0.151**	0.114**	0.149**	0.110*	0.119**	0.115**	-0.031	0.118**	0.016
Q21	p-value	0.001	0.010	0.001	0.013	0.007	0.009	0.486	0.007	0.725
	Sample (n)	515	515	515	515	515	515	515	515	515

4.5 The relationship between teaching methods and teaching motivation among China primary school teachers in online classroom

1. While measuring Teaching motivation VS the use of teaching methods, it was revealed that competence, autonomy and relatedness were the three important components of motivation in self-determination theory. While Q25, 26 and 27 were aimed at teachers' competence, Q28, 29 and 30 were aimed at autonomy, and Q31, 32 and 33 were aimed at teachers' relatedness. Table 17 summarizes these findings.

Table 17

The Spearman's Correlation Coefficient

	Q5	Q7	Q9	Q11	Q13	Q15	Q17	Q19	Q21	Q23
Q25	0.355**	0.270**	0.194**	0.187**	0.320**	0.278**	0.194**	0.209**	0.153**	0.340**
Q26	0.423**	0.290**	0.263**	0.268**	0.390**	0.429**	0.357**	0.294**	0.208**	0.358**
Q27	0.358**	0.244**	0.163**	0.242**	0.286**	0.311**	0.283**	0.112*	0.166**	0.300**
Q28	0.326**	0.333**	0.259**	0.257**	0.285**	0.350**	0.280**	0.186**	0.151**	0.316**
Q29	0.365**	0.192**	0.193**	0.238**	0.284**	0.370**	0.344**	0.154**	0.134**	0.338**
Q30	0.371**	0.336**	0.211**	0.255**	0.335**	0.292**	0.302**	0.268**	0.198**	0.330**
Q31	-0.066	-0.040	-0.032	0.040	-0.043	0.002	0.036	-0.044	0.064	0.082
Q32	-0.035	-0.012	-0.067	-0.027	0.044	0.004	0.012	-0.060	0.008	0.072
Q33	-0.017	0.014	0.053	-0.006	-0.002	0.091*	0.054	-0.005	0.016	0.187**

* $p<0.05$ ** $p<0.01$

Table 17 also reveals that teachers' competence and autonomy are strongly correlated with almost every teaching method in online classrooms (including Lecture, Conversation, Discussion, Reading guidance, Demonstration, Visit & Observation, Practice, Experiment, Appreciation & Edification, and Discovery). The correlation (Q31, 32, 33) is not related to most teaching methods, only the relationship between teachers and parents (Q33) has a positive correlation with the Visit & Observation and Discovery.

2. Likewise, the correlation between teaching motivation VS the mastery of teaching methods was measured. Table 18 shows teachers' competence (Q25-27) and autonomy (Q28-30) have a strong correlation with the mastery of almost every teaching method in online classrooms. The case of correlation (Q31-33) is more complicated.

Table 18

Spearman's Correlation Coefficient

	Q6	Q8	Q10	Q12	Q14	Q16	Q18	Q20	Q22	Q24
Q25	0.200**	0.361**	0.394**	0.336**	0.405**	0.227**	0.305**	0.324**	0.113*	0.406**
Q26	0.234**	0.386**	0.474**	0.403**	0.455**	0.277**	0.435**	0.433**	0.162**	0.495**
Q27	0.187**	0.350**	0.416**	0.322**	0.387**	0.233**	0.361**	0.276**	0.155**	0.384**
Q28	0.139**	0.373**	0.410**	0.345**	0.460**	0.275**	0.333**	0.345**	0.201**	0.420**
Q29	0.271**	0.352**	0.406**	0.391**	0.367**	0.312**	0.362**	0.351**	0.169**	0.401**
Q30	0.162**	0.371**	0.388**	0.309**	0.424**	0.285**	0.392**	0.348**	0.113*	0.496**
Q31	-0.002	0.105*	0.208**	0.071	-0.016	0.068	0.095*	0.090*	0.064	0.030
Q32	-0.019	0.122**	0.164**	-0.066	0.054	0.032	0.068	0.045	0.120**	0.053
Q33	0.020	0.172**	0.227**	-0.006	0.086	0.087*	0.156**	0.127**	0.127**	0.101*

* $p<0.05$ ** $p<0.01$

Table 18 also reveals that the relationship between teachers and colleagues (Q31) is significantly related to teachers' mastery of the Conversation, Discussion, Practice, Experimentation. Teachers' relatedness to students (Q32) is significantly correlated with teachers' mastery of Conversation, Discussion, Appreciation & Edification. Teacher relatedness to parents (Q33) is significantly correlated with the mastery of most methods, including Conversation, Discussion, Visit & Observation, Practice, Experimentation, Appreciation & Edification, Discovery.

Discussion

RQ1: Relationship Between Teaching Experience and Teaching Methods

There were several revelations from this study. Right at the outset, to answer the first research question, a thorough examination of each teaching method's relationships revealed that each one is was linked to at least one aspect of teaching experience. For instance, while the Conversation's use or mastery was unrelated to the teacher's overall teaching time, its mastery correlated significantly with another dimension of teaching experience, such as the number of grades taught by the teacher. In short, each method had a connection with teaching experience. Previous research has provided evidence in support of these findings validating that, in practice, teachers often link teaching experience with teaching methods. For instance, Zhang (2021) identified a correlation between discovery-based teaching and the development of students' critical thinking skills through teaching experience. Zhang's valuable conclusions on the discovery stem from extensive teaching experience. Huang (2005) provides a detailed analysis of the lecture's function based on teaching experience. This highlights the relationship between teaching experience and teaching methods. Wang and Zhang (2015) discovered that teachers with plentiful experience can identify learning obstacles in students quicker, leading to better results. On the contrary, new teachers require more time to identify the issues. Improving a teacher's experience can be beneficial in the online classroom as it had correlation with their use of teaching methods.

RQ2: Relationship Between Educational Background and Teaching Methods

The Chinese education researchers had long recognized that teachers' academic qualifications have correlation with their classroom teaching. Jin (2001), for example, had conducted quantitative research and discovered that the average classroom quality score was significantly higher when teachers possessed a master's degree qualification, compared to those with an undergraduate academic qualification. Although there is a statistical regularity in the teaching methods used by a particular group of teachers, referring to their preferred instructional approaches (Ren, 2010), the academic credentials of the teacher can influence their distribution and significance to some extent. This outcome is not only a finding of the present study but has also been analyzed previously. Xu's (2012) indicates that academic qualification impacts teachers' behaviour, specifically curriculum and teaching design. The total learning time is comparable to the teacher's academic qualification. Early studies suggest a positive correlation between teachers' total learning and teaching ability (Yi, 2012).

In recent years, too, many researchers have realized that teachers' relearning is a good means to change teachers' bad habits in the use of teaching methods and to enhance their use and mastery. For instance, Ying (2023) highlighted the issue of overemphasizing the transmission and reception of information in teaching, such as overusing the Lecture. China teachers call it "spoon-feeding" education, which poses a significant concern in online classrooms, necessitating teachers to enhance their learning and alter their mindset. To address this matter, particularly with regards to China's new curriculum standards, a crucial path is for teachers to engage in self-learning and lifelong learning (Zhang, 2016). Improving one's educational background is an evidently effective approach towards enhancing teaching methods. Typically, upgrading educational qualifications is less

challenging than upgrading teaching experience. An illustration of this is evident in China's Guangdong Province, where rural primary school teachers have been improving their academic qualifications and enhancing skills in various aspects.

The measure to augment learning among teachers has yielded positive outcomes (Liu et al., 2014). In fact, improving teachers' the academic qualification of the teacher and strengthening learning are beneficial not only to schools and teachers, but also to students. Yao and Ma (2022) found that the improvement of teachers' the academic qualification of the teacher can improve students' performance and quality in many aspects.

RQ3: Relationship Between Teaching Experience and Teaching Motivation

No articles exist that directly analyze the correlation between teaching motivation and experience. However, some studies suggest that teaching experience can impact teaching (Xin, 2022), while teaching motivation can have an effect on teaching (Cheng, 2021). Based on this reasoning, it is possible to propose a hypothesis regarding the relationship between the two factors. However, based on the quantitative findings of this study and an analysis conducted using the self-determination theory framework, it appears that teaching experience solely have correlation with competence and autonomy, as previously stated. Additionally, the results suggest that enhancing experience may not necessarily lead to a better teacher-student relationship. The connection between teachers' educational experience and teaching motivation is found to deepen the integration of teaching philosophy and practice, and stimulate teachers to be more proactive in teaching. This discovery can improve the quality of education, promote student growth, and build a more motivating learning environment.

RQ4: Relationship Between Educational Background and Teaching Motivation

Cheng's (2010) analysis of the academic qualifications of teachers revealed a direct link to their competence levels. Some studies indicate a connection between teachers' educational background and their level of autonomy. For instance, Xu (2005) demonstrated that teacher education leads to improved autonomy, which has recently provided teachers with greater independence. It should be noted that there is a negative correlation between the improvement of educational background and the relationship between teachers and colleagues. Currently, there is no research examining the effect of teacher qualifications on communication, and further research is required.

RQ5: Relationship Between Teaching Methods and Teaching Motivation

As highlighted in the literature review, there is a scarcity of research directly examining the correlation between teaching methods and teaching motivation. Our study employs quantitative data to establish a link between the two, providing significant reference value for further research. The connection between teaching methods and teaching motivation is crucial and has multiple implications for schools, society, and the education sector. They can promote the improvement of academic performance among students in school and cultivate a positive attitude towards learning. Society may benefit from more innovative talents. The education department may find a new path to achieve goals and improve the quality of education.

Conclusion

This study linked teaching methods, teaching motivation, teaching experience, and educational background from different perspectives. Although a comprehensive connection has not been established, such as the inability to link certain teaching methods with the relevance of teaching motivation, it is still valuable as it provides us with a preliminary understanding of how all teaching methods have correlation with teaching motivation. While there has been limited research investigating the direct correlation between teaching experience and specific teaching methods in China, this study established a relationship between teaching experience and the majority of teaching methods.

The results of this study hinted at the connection between teaching experience and teaching methods. This finding would help schools and education departments to understand how to improve teachers' teaching methods, and teaching in online classrooms. Relevant policy makers can also benefit from it. Likewise, the connection between the educational background of teachers and teaching methods was also found to be of great significance in this study. This study would help to improve teaching effectiveness, make education more targeted and professional, and promote students to better understand and apply knowledge. At the same time, it can enable teachers to flexibly apply what they have learned in practice, better meet the needs of students, and promote the in-depth development of education.

The connection between teaching methods and teaching motivation is also crucial and has multiple implications for schools, society, and the education sector. They can promote the improvement of academic performance among students in school and cultivate a positive attitude towards learning. Society may benefit from more innovative talents. The education department may find a new path to achieve goals and improve the quality of education. Finally, the connection between teachers' educational experience and teaching motivation is found to deepen the integration of teaching philosophy and practice, and stimulate teachers to be more proactive in teaching. This discovery can improve the quality of education, promote student growth, and build a more motivating learning environment. It should be noted that there is a negative correlation between the improvement of educational background and the relationship between teachers and colleagues. Currently, there is no research examining the effect of teacher qualifications on communication, and further research is required.

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