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COMMENTARY

How to Retain Rural Preschool Teachers?

Yuhua Luo, Suojun Yuan, Longjun Zhou

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"Education is not the filling of a pail, but the lighting of a fire."
–William Butler Yeats

AS a result of the accelerated urbanization and the improved remunerations of urban teachers, a large number of rural teachers have been pursuing employment in urban areas, resulting in a severe shortage of rural teaching staff. This phenomenon is particularly pronounced in developing countries. Disadvantages in rural school working and living situations such as low pay, poor living conditions, heavy workloads, limited professional development has made teacher recruitment and retention extremely challenging tasks. The unbalanced urban-rural distribution of teachers, especially high-quality teachers, have become barriers to rural education development and further exacerbated the disadvantaged situations of rural students.

Due to the exclusion of preschool education from China's compulsory education and a lack of professional identity among rural preschool teachers (Yu & Liang, 2008), the turnover rate of rural kindergarten teachers has been worse than that of rural primary and secondary educators. In order to alleviate the economic burden of farmers, rural kindergartens typically charge low fees. They are mainly funded by donations of various sources or by its founder(s). On the one hand, due to the high kid-teacher ratios, a rural kindergarten teacher often has multiple roles to play, including the head of the kindergarten, teacher, child-care worker, and even cook. Their workloads are

far more intense than those of their urban counterparts. On the other hand, the salary of a rural kindergarten teacher is even lower than the average income of local farmers, and most of them are not entitled to medical insurance, endowment insurance and other welfare benefits. As a consequence, they have difficulty maintaining a decent life. Furthermore, few rural preschool teachers are accorded with the Bianzhi (a system of publicly funded posts in China) membership, which make them feel excluded from the current education system.

How to revitalize rural education and encourage high-competence rural teachers to devote themselves to education has become a global concern. Governments around the world have implemented a series of strategies to ensure supply of qualified teachers for rural educational institutions including rural kindergartens. For example, in 2013, China initiated the National Teacher Training Program which was open to kindergarten, primary and secondary school teachers all over the country. The program provides teachers with training in various aspects such as basic educational theory, teaching methodology and class management. In the following three years, about 10,000 principals and teachers from rural kindergartens received this nation-level training. More recently, China's Ministry of Education introduced a professional ranking system for preschool education to evaluate teachers' qualifications and ability and tie their salaries to their professional rankings (Wang et al., 2020). In Bangladesh, the government not only increased training expenditures for rural preschool education, but also encouraged rural teachers in pilot kindergartens to experiment new educational methods (Opel, 2009). Such initiatives help improve rural preschool teachers' working conditions and increase retention rate of rural kindergarten teachers in developing countries.

Boosting rural preschool teacher supply necessitates more pertinent research from academia. *Factors Influencing the Turnover Intention of Rural Preschool Teachers in the Context of Rural Revitalization: An Analysis Based on a Moderated Mediation Model* in this issue examined the status quo of preschool teacher turnover in China's rural areas and identified the impact of work stress on rural preschool teachers' turnover intention via the mediating effect of job apathy. The moderator role of Bianzhi membership was emphasized. This study recommended that a series of reforms should be carried out to restrict the workload of rural preschool teachers to a reasonable level, increase their salaries and compensation, create a teacher-friendly environment, and allocate adequate Bianzhi memberships to rural kindergartens with the aim of lowering the turnover rate and promoting the supply of rural preschool teachers (Wang et al., 2022).

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ORIGINAL ARTICLE

Online Shadow Education in Hong Kong: Perspectives from Secondary School Students and Private Tutors

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***Abstract**: Based on the educational hierarchical reproduction theory and the MMI and EMI hypotheses, this paper discusses the impact of the tracking of general and vocational education at the secondary level on higher education opportunity equity among social classes. The study finds that increasing gross enrollment rates of both general high schools and secondary vocational schools can help improve the equity in admission opportunities of colleges and universities among social strata; expanding the share of general high school places by adjusting the structure of general and vocational tracks (that is, the general-vocational ratio) can effectively reduce the class disparities in college and university admission opportunities; neither the change in the scale nor in the structure of general and vocational tracks will contribute to alleviating class inequality in top university enrollment opportunities.*

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***Conflict of Interests**: None.*

Introduction

DURING the COVID-19 pandemic situation, there have been many transformations in different sectors of society. Education is one of these sectors, including in the modes of teaching and learning, as schools need to follow strict virus prevention guidelines. Harris and Jones (2020) described how COVID-19 has shaken the education world and has brought many chaotic moments to schools around the world. Although the pandemic has led to 'undeniable chaos' (Hargreaves and Fullan, 2020), it has also made educators change. For example, lessons have been reorganized (Zhao, 2020), and computer software has begun to play an even more important role. As for school leaders, many decisions have been made in response to newly required protocols and procedures (Netolicky, 2020). Furthermore, not only the mainstream schools need to follow the guidelines set by the Hong Kong Education Bureau; the private tutoring sector must also follow these rules, as they are also managed by the bureau (Eng, 2019). As a result, private tutorial centers in Hong Kong cannot open for face-to-face lessons, and some of these centers have been forced into bankruptcy. Other centers have installed software, such as Zoom and Google Classroom, which allows students to attend lessons online.

The focus of this paper is how students and private tutors felt about teaching and learning in online private tutoring. This can help us determine whether online shadow education is a viable alternative during the pandemic. This study attempts to answer several questions:

(1) What are students' and private tutors' general impressions of online tutoring?
(2) What are some of the areas that private tutors need to be aware of in online tutoring?
(3) Can this type of method (online tutoring) become a future trend for shadow education in Hong Kong?

What is Shadow Education?

Shadow education refers to education that is received outside of the mainstream school classroom, and these types of lessons are often called 'supplementary lessons' or 'private tutorial lessons' (Aslam & Atherton, 2012; Bray, 1999; Bregvadze, 2012). In a broader sense, shadow education can represent any form of teaching which works under or in parallel to the 'light' that is the general school curriculum (Bray & Kwo, 2014). This sort of education aims to help students improve their school knowledge (UNESCO, 2012, p.76), and scholars have noted that schools, families and friends are possible variables which affect the relationship between shadow education and student's academic achievements (Buhagiar & Chetcuti, 2013). In modern Hong Kong society, it is common for students to attend private tutoring after their mainstream school lessons, especially for secondary school students who must take the Hong Kong Diploma of Secondary Education Examination (HKDSE) in their final stage of study. This is the norm in Hong Kong because the general public believes that exam performance can accurately portray students' abilities (Ball, 2016), and this kind of high-stakes testing system has been long established in Asian countries (Carless, 2011). As a result, most of the par-

ents in Hong Kong insist that their children take more classes in order to get good results on the public examination.

Shadow Education around the World

The settings of shadow education differ around the world. Due to different cultures and societal backgrounds, the form of shadow education has been variously adjusted (Bray, 1999). There is a huge demand for shadow education in East Asian countries, such as South Korea, Japan and China. Those areas value education and hard work and emphasize academic achievement (Liu, 2012). For example, in China, an estimated 55% of urban families invested in supplementary classes (Xue & Ding, 2008, p. 3). Another study pointed out that among 827 grade 10 students in China's Gansu, Hunan and Jiangsu provinces, 75% attended extra classes after school (Shen, 2008, p. 3). In South Korea, the case was very extreme; they refer to shadow education as 'hakwon', and the lessons usually have 10 to 15 students (Kim, 2016). According to Kim (2016), the Amount of Educational Expenditure survey for hakwon showed that around 7 million children in Korea needed to take hakwon, and of those children, 80.9% were from elementary school, 70.6% from junior form and 50.7% from senior form. As Kim (2016) further elaborated, hakwon can help children improve their academic results and increase their chances of matriculating at a prestigious university. This is important in Korean society because of the emphasis on academic achievements, as indicated by the country's Program for International Student Assessment (PISA) results: South Korea ranked in the top four countries for its students' math, reading and science abilities in 2000, 2003, 2006, 2009 and 2012 (Organization for Economic Co-operation and Development, 2013).

Shadow education also plays an important role in Western societies. According to Paiva et al. (1997), 50% of students in Rio de Janeiro public schools received supplementary lessons after school. This is also very similar to the situation in Northern European countries. According to Bray (2011), the Scandinavian countries provide extra lessons for students who cannot keep up with mainstream school lessons. However, Bray also noted that shadow education has likely become more popular because of increased competitiveness in European societies. One of the priorities of shadow education is to help students recap their knowledge and enhance their abilities.

As for Hong Kong, families are fully aware that their children's public examination results will shape their future. Education is one of the main keys to success, and many believe that those who perform well in public examinations will have a better opportunity to enroll in a prestigious university (Bray, 2013). Further, after they graduate, they may have a higher chance of finding an ideal job. Bray's (2013) study on secondary students' time use in shadow education indicated that students in Hong Kong need to take extra classes to fulfil the 'no loser' principle. According to Bray (2013), form six (Grade 12) students in Hong Kong spent an average of 4.76 hours per week in the tutorial center during the examination season. Furthermore, 71.8% of the 1,624 student participants expressed that they had attended tutorial classes during the previous 12 months (Bray, 2013). These results imply that the demand for private tutoring is a result of the highly competitive nature of Hong Kong society. The education and social sys-

tem will create the winners and losers, and students try not to be the losers in this game (Bray, 2013). As a result, they invest heavily in shadow education.

The Public Impression of Shadow Education

One of the general impressions of shadow education is that it increases social inequality. In previous literature from Bray (1999), private tutoring has been shown to create problems, such as education inequality and economic burdens for families. As has been further highlighted by Amartya Sen, who won the Nobel Prize in 1998, private tutoring has increased pressure on these families (2009, p.13). However, many parents still insist that their children go to the tutorial center. They do not want to risk their children being left behind, so they work hard and save carefully in order to send their children to private schools. The study also pointed out that 54% of the parents could not afford the tuition fee of the tutorial center, so they had to forfeit the opportunity (Sen, 2009). Bray and his colleagues (2018) provide further proof of shadow education leading to social inequality; their paper indicates that the quality of education in Cambodia is dependent upon money. That is, students who cannot afford to go to the learning center may not receive a quality education. This social inequality problem is the biggest public impression made by shadow education on the general public.

Another impression, this one student-centric, is that there might be a backwash against learning in mainstream school after taking private tutorial classes. Shadow education may lead students to think that private tutoring lessons are better than mainstream school lessons (Yung and Bray, 2016). Private tutorial lessons focus more on exam skills and techniques, while mainstream schools primarily focus on developing an abilities and character. As a result, students tend to work harder in tutorial centers (Zhan et al., 2013).

However, there are also some positive aspects to shadow education. First, it has helped students to achieve good scores on their public exams, as can be seen in South Korea's PISA performance. Korean children ranked in the top four countries for math, reading and science abilities in 2000, 2003, 2006, 2009 and 2012 (Organisation for Economic Co-operation and Development, 2013). Loyalka and Zakharov (2016) elaborated on which group can benefit the most from shadow education; they indicated that those who have higher academic abilities tend to perform better after taking extra lessons, and they further concluded that shadow education can give an additional advantage to those high achievers. Yung and Bray (2016) argued that shadow education does not only help high achievers but also slow learners, as it provides an opportunity to revise and practice mainstream school lessons. Furthermore, the setting of a private tutoring lesson is better than that of a mainstream school, as the teacher does not need to cater to a group of 30 or more students (Bray, 2013). As a result, students may have more opportunities to ask questions and quicken their learning progress. Yung (2015) also mentioned that students are more willing to speak up during private tutorial lessons. During the pandemic, this advantage became more obvious. Students can use online software, such as Zoom, to attend tutorial classes, and they can choose whether they want to show their faces (Yung, 2020). This has encouraged students to speak during tutorial classes, which can help them learn more effectively (Yung, 2020).

The Use of Technology in Shadow Education

Various online methods have been introduced to improve the COVID-19 situation, and Zoom has become an integral part of connecting people in their daily lives. Students have been able to continue their education through online lessons and have commented that those lessons are convenient, flexible and efficient (Horrell et al., 2015). Zoom has also provided a platform for other occasions, such as visiting relatives or attending chapel. According to The Guardian (2020), 200 million people use Zoom every day to socialize, to work and for other kinds of activities. Although those who usually do things in person may find this situation frustrating, other groups have actually gained sizable benefits through their use of Zoom. Elderly persons, for example, have become more sociable because they can use Zoom to contact anyone they like (The Guardian, 2020).

Research has shown that technology can provide new ways to conduct private tutoring classes. Further, some studies have shown that technology helps students to learn better during their private tutoring classes, since they are more willing to express themselves (Yung, 2020). More evidence can be found in the United States of America, where students are more willing to complete online homework than paper-form assignments, and around 73% of middle school students completed their school assignments through use of the Internet (DeBell & Chapman, 2006). However, these studies do not fully explain why students are more willing to perform in online classes, and other stakeholders' points of view have not been included. There is still a need for research related to technology and shadow education in order to show any significant relationship; thus, this research focuses on online shadow education in Hong Kong.

Significance of this Study

In Hong Kong shadow education study, it has only a limited research related to online shadow education. Yung (2020) has mentioned that when students switched to online classroom during the pandemic period, they seemed to have both positive and negative impact in learning. For example, some of the "quiet" students may become active in online setting, whereas some of the students may not even response to teacher's question. However, there is not enough study focusing on the impact of online shadow education in Hong Kong, and there should be a voice from private tutors about the impact of online shadow education. As a result, the above literature has mentioned a lot about shadow education from mainstream school teacher's and student's perspective, and this research would like to put the emphasis on students and private tutors in Hong Kong.

Methodology

This study focused on students' and private tutors' perspectives about online private tutoring in Hong Kong, so the data collection methods prioritized expressions and elaboration; individual interview, group discussion and lesson observation were the main methods. All the data were codified and followed all relevant ethical procedures. The students in this research were from different bandings' secondary schools (Band 1 through Band 3), which allowed students at different academic levels to express their

opinions about online private tutoring (Chan & Bray, 2014). All private tutors included in this study had at least 10 years of private tutoring experience.

Participants and Settings

The students in this research had been taking online private tutoring lessons since the beginning of COVID-19. They were all form 6 students, as these may have more private tutoring experience than students in other forms (Bray, 2014). Moreover, form 6 students need to attend the Hong Kong Diploma of Secondary Education Examination (DSE) in order to continue their studies. Due to worries related to competitive performance on this exam, they have more reason to apply for extra classes (Yung, 2020).

The tutors included in this research had at least 10 years of private tutoring or teaching experience in the local area. They taught different subjects in their tutorial center, allowing a broader picture of the impact of online teaching and learning in the private tutorial sector during the pandemic. All tutors had some experience dealing with online classes, as they have used them for teaching purposes during the pandemic.

Twelve students and six private tutors participated in this study. The ethical procedures, which are discussed further in the coming section, were carefully implemented. The participants' backgrounds were also considered because their academic performance may have affected the results of this study. In similar educational studies, researchers often justified their reasons for choosing a specific group of participants (Bui & Kong, 2019); for this research, the participants were from schools in three different bandings, which ensures that all variants within the data can be addressed and that the data can capture a broader picture of the Hong Kong secondary school context. Below is the background of the students (**Table 1**).

Three of the private tutors were from locally famous private tutoring centers, while the other three were from local learning centers. Below is the background of the private tutors included in this research. Some of the 'big name' learning centers in Hong Kong, such as Modern Education, can provide extensive resources to students, while local learning centers are more limited. Since most of the local learning centers aim to provide basic education support, such as exercise worksheets, to students, they do not provide support comparable to that of some of the big brands in the Hong Kong private tutoring sector (**Table 2**).

All the participants were from Hong Kong, and their first language was Cantonese. As a result, all the interviews and group discussions were conducted in Cantonese. This allowed the participants to express their ideas freely, and they were more motivated to speak during the data collection process (Longhurst, 2003). The research was mainly conducted in a college meeting room, since the setting is suitable for both individual interviews and group discussions. Prior notice was given to the college about using the facility for research purposes, and they agreed to lend their meeting room for this study (**Table 3**).

Data Collection Procedure

The study was conducted from October 2021 to December 2021, and all participants were able to attend all sessions. There were no dropouts, but the interview schedule was modified because of the participants' school exams and busy itineraries (**Figure 1**).

Table 1. Participants' Backgrounds.

Band 1	Band 2	Band 3
4	4	4

Table 2. Tutors' Backgrounds.

Local tutors from famous learning centers	Local tutors in local learning centers
3	3

Table 3. Below is the demographic background of the subject in this study.

Name (pseudonym)	Gender	Studied/taught subject
Alan (student)	Male	English and Liberal studies
Betty (student)	Female	English
Jasmine (student)	Female	English
Ray (student)	Male	English
Chris (student)	Male	English, Math and Liberal Studies
Anna (student)	Female	Chinese and English
Sally (student)	Female	English
John (student)	Male	English
Chan(student)	Male	English and Math
Charlotte(student)	Female	English
Lucy (student)	Female	English
So (student)	Male	English
Monica (tutor) franchise learning center	Female	English (Zoom)
Kevin (tutor) Local learning center	Male	English and Math (Zoom)
Lee (tutor) franchise learning center	Male	Chinese and Math (Zoom)
Francis (tutor) Local learning center	Male	English (Zoom)
Wong (tutor) franchise learning center	Female	English (Zoom)
Emily (tutor) Local learning center	Female	English (Zoom)

Purposive sampling was used in this research, since there were some criteria for the participants (Etikan et al., 2016).For example, students and tutors were required to have experience with online tutoring. The first student's individual interview took place on 8 October 2021. The interviews were semi-structured in order to allow participants to interact and express related ideas (Longhurst, 2003). The student interview process lasted around two weeks, and each interview took around 30-45 minutes to complete, depending upon interaction with the participant. As for the individual tutor interviews, the first was conducted on 25 October 2021, and it was also semi-structured. Since the number of tutors was smaller than that of students, all the tutors' interviews

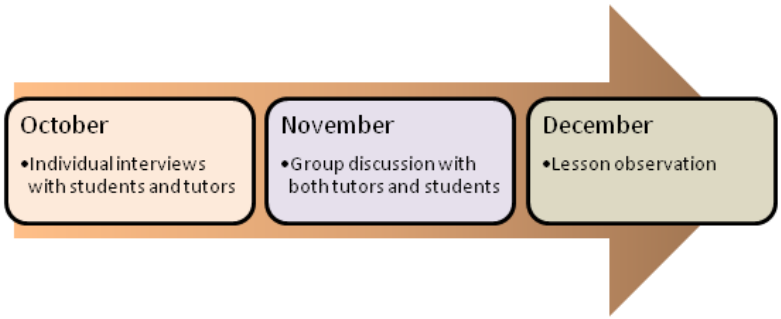

Figure 1. A Brief Research Process and Data Collection Timeline.

were completed within one week. The interview protocol (see sample questions in **Appendix A**) was provided before the interview, which allowed the participants to prepare. All participants gave permission for their interviews to be recorded.

After finishing the first stage of the individual interview, participants were invited to attend the group discussion sessions in November. Since the group discussion date overlapped with some of the students' exam dates, the discussion sessions were changed to near the end of November (27 November 2021). The students were separated into two groups with six people in each group, and each group included at least one representative from each banding. During the discussion, they exchanged ideas related to online private tutoring, such as the strengths and weaknesses of that tutoring. The discussion lasted 45 minutes. As for the tutors, all six met early in November and discussed their impressions about online shadow education. During the discussion process, a recorder was again used, and permission was granted by all participants.

The third stage of the study was lesson observation, which was used to triangulate the data and find out more about the impact of private online tutorial lessons. Three students and their private tutors agreed to be observed by the author during their 45-minute online class. However, recording was prohibited during their lessons; only field notes were used to document any details related to the research topic. The observations were conducted through Zoom, which is popular online conferencing software in Hong Kong, and both student and teacher behaviors were marked down for further analysis. During this stage of research, the students and teachers both activated their cameras, allowing for observation of any gestures or expressions.

Data Analysis

Interview responses and group discussion ideas were transcribed and further analyzed. This analysis was guided by the research questions in this paper. Responses that were related to either students' or tutors' impressions of online shadow education and teaching and learning strategies were carefully sorted. After determining the key ideas, they were compared and contrasted among the groups, allowing for the identification and validation of the societal situation and any trends. By analyzing and comparing key

points, societal theories and trends can be clarified (Gibbs, 2018), and this research identifies both new trends and novel ideas.

As for the lesson observation, field notes, the main instrument in this data collection method, allowed the researcher to mark down responses from the participants and make note of any significant observations related to the study (Tenzek, 2018). During the lesson observation, students' and tutors' behaviors, as well as the lesson setting, were noted, as this kind of information was considered to be objective information from the participants (Tenzek, 2018). In addition to descriptive data, reflective field notes (ideas from my point of view about the reasons students and tutors behaved or reacted in given ways) were also included. The reflective notes allowed me to reconsider the situation and re-evaluate the data.

In data analysis stage, for both individual interview and group discussion, thematic analysis was applied in this study. In order to conduct thematic analysis, 6 steps were used in analysis. Those 6 steps are familiarization, coding, generating themes, reviewing themes, defining and naming themes, and producing the report. According to Terry et al. (2017), thematic analysis allows qualitative researchers to effectively present the results to readers. Below is a brief explanation of each step.

(1) Familiarization: familiarize the data first, and try to come up with general questions, ideas or themes from the interview data.
(2) Coding: identify and mark down ideas that appear in all the data. By doing this, it can help researcher to see whether there are any common patterns among the interview transcripts.
(3) Generating themes: based on the coding results, researcher can construct several related themes. When constructing those themes, research questions can also put in use to help researcher to build those themes.
(4) Reviewing themes: the part can check whether the themes and data match with each other, and also it can see whether the data can answer the research questions.
(5) Defining and naming themes: identify the definition of some of the concepts inside, and see whether any parts of the themes are too thin.
(6) Producing the report: writing the report, and focus back on the general picture of this topic.

Ethical Considerations

Ethics in educational and social science research is very important, since there may be many opportunities to work with human subjects. Participants may sometimes be misguided or unaware of the ways in which a study will use their information; for this reason, educational and social science researchers must pay special attention to ethics (Robson, 2011). In this study, the participants were informed about the research background and purposes. All participants signed consent forms before any research procedures began. The consent forms were from Andrews University, which is affiliated with the researcher's current institution. Furthermore, all ethical procedures went through the Institution Review Board, and prior notices were delivered to all the related school principals or school authorities. All the participants could withdraw from the study at any point if they felt uncomfortable with the questions or research procedures. After all

the interviews, the transcribed data were sent to the related participants so that they could check the accuracy of their responses. The researcher was the only person who could assess the data, but some concepts and ideas were discussed with another colleague. The names of the participants were codified, and only their first names were used when necessary.

Findings

Based on the research questions of this paper, the data can be categorized into three aspects: general impressions of online private tutoring classes, areas that need more attention when conducting online classes in shadow education and future trends in shadow education.

General Impressions of Online Private Tutoring Classes

Generally speaking, students tended to express positive opinions about online classes, as they appreciated being able to attend from home. However, most tutors believed that it would be more productive to interact face-to-face. All students expressed that online tutorial lessons were a secondary but still important aspect of their education.

- Under the strict social distancing guidelines in Hong Kong, online tutorial lessons were the only way for me to practice DSE.
- Online classes are fun, since we do not need to go to school in person.

However, some students were puzzled by the follow-up question about the usefulness of an online tutorial class. They expressed that online classes were usually carefree and that teachers had obvious difficulty managing the disciplines and technical issues. Some participants' responses are shown below.

- My private tutor used 15 minutes to deal with technical issues, but my lesson only lasted for 1 hour. It seemed a bit of a waste of time.
- I do not know whether this is true, as I have never taken any online tutorial class before. I would think online class is like talking to a machine/ computer, and it doesn't motivate me to learn. I would check my phone or even be distracted if I was doing online class at home.

As for the tutors, they expressed that online tutorial lessons were essential for them, but like the students, some had doubts about the utility for students. Some tutors' responses are shown below.

- Online classes have saved my job. I was able to get paid because of this. Of course, we all wanted to go back and do our stuff in the old way. However, because of COVID-19, we have used some alternative methods.

If you ask me about whether this is useful, I can only say it really depends on students. If they are lazy, then online learning won't work for them. They can get distracted, and if they close the camera, we won't know what they are up to. So, it really depends on students. For me, I will just do my part, such as changing my materials into an online version for my students, and that's it.

- For me, in this situation, Zoom has changed the world of education. Students can listen to our lectures whenever they want. It breaks the barrier of locations, races and languages. My impression of online private tutoring is inno-

vative, and I believe in the coming future it will be more innovative in our education field.

However, if you ask me whether this is useful for students, I will say it provides them with a choice. They can choose the most suitable method for themselves, but, as you may know, they may choose wrong. They may work better in face-to-face mode.

The above results are somewhat similar to those of Yung's 2020 study, which indicated that students expressed positive reactions toward online lessons. As students could stay at home for their lessons, they felt more comfortable. However, in this research, some tutors and students expressed uncertainty regarding whether online private lessons were useful in terms of improving students' academic performance or increasing their knowledge.

As for academic performance, only a few students mentioned that online classes helped them increase their examination marks, such as 'my grades were better than last year because online private lessons helped me to revise the concepts before my exam'. The tutors indicated that online classes allowed them to revisit concepts with the students, and they believed this would make a difference between those who attended online private tutorial lessons and those who did not.

Areas that Need More Attention during the Online Private Tutoring Class

Online shadow education is an alternative because of the pandemic, but students and tutors generally expressed positive impressions of this type of education. However, this study also focuses on those aspects of online teaching to which tutors need to pay more attention. According to the individual interviews and group discussion with the tutors, these opportunities for improvement in online private tutorial classes included ensuring that students were paying attention, privacy problems and issues with online teaching materials.

Tutors expressed that it was a challenge to make sure their students were in class. Some participants' responses are shown below.

- You never know whether they are online or offline, and that is why you need them to open their camera. By doing this, you can ensure that student's attendance.
- I will randomly ask them questions throughout the lesson. If they missed any of them, they would have to copy the answers several times. This can make them pay attention during the online class.
- I agree that asking questions is a good way, and I will do the same as well. I usually ask them to turn on the camera only. At least I can make sure they are here.

As shown, the most common ways to determine whether the students were still in class were asking random questions and asking them to turn on the camera. However, some tutors reported the use of interesting teaching strategies to increase interaction. Some participants' responses are shown below.

- I try to include some trivia questions during the lesson, and I will use Kahoot to play a small game with my student. My student pays more attention in class

because they think that the information in that lesson may help them to win the Kahoot game.

- I will try to think of some games, such as hangman, for my students to learn new words.

As for the privacy problem, all the tutors mentioned that they usually used a virtual background during the lesson. This made them feels more comfortable since they did not want students to know about their background or be distracted by things in their homes. Therefore, they suggested that future tutors who would like to use Zoom as the main medium do the same thing. They additionally agreed that students should also make use of the virtual background during lessons.

Lastly, tutors need to be aware of the availability of online learning materials. All tutors agreed that they needed to prepare a set of materials for students to access online, since they cannot provide them with the hardcopy. Tutors must also take more time to prepare for the lesson so that it seems 'tailor-made' for the course or student. The online private tutorial class required tutors to devote more time to lesson preparation. This was a topic of conversation during the tutors' group discussion.

Regarding teaching strategies, the students also provided some ideas about how to motivate them in class. Below is an excerpt of one of their conversations.

Anna: Sometimes teachers just teach and ask us to do exercises, so it is easy for us to lose focus.
Chris: My teacher actually will prepare some MC questions on Zoom and ask us to vote. I think it is very interesting.
Charlotte: So good that you have those activities; my teacher is just like Anna's.
Chris: I actually think if they have more activities, the lesson will be more interesting.
Anna: True. For me, I just keep doing exercises. I can do those by myself, why do I need to attend the lesson?

The findings from the above showed students suggested more online activities during virtual instruction, which shadow educators can take as a recommendation to improve their lesson quality. This conversation also makes clear that students' motivation in online private tutorial classes was correlated with the in-class activities. Some may feel interested in participating more fully in a class with these activities, while others may question the necessity of their attendance. **Figure 2** depicts the lesson process, according to Anna's description.

As a result, students may become bored and begin to lose interest. They may even begin to think that they can check the answers by themselves; after all, they are form 6 students and therefore old enough to do so.

A follow-up question from the interview protocol about motivation in an online private tutorial class showed that half of the students were motivated. Anna and Charlotte were among those who said they were not motivated because of the boring lesson design. The other half, including Chris, mentioned that they were motivated because teachers would use different activities to attract their attention. Some of the students

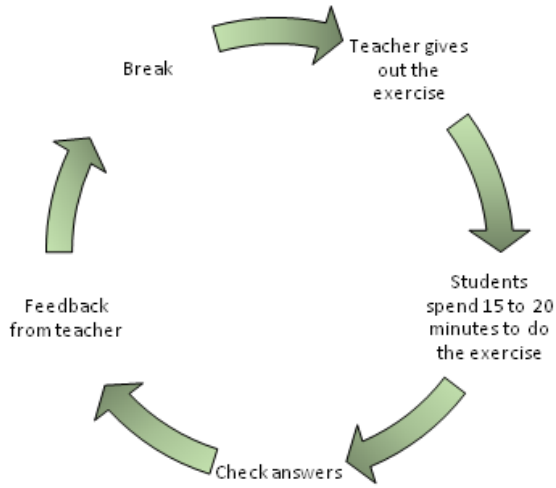

Figure 2. Lesson Process Following Anna's Description.

even explained that their tutors would provide rewards to encourage them to pay more attention in class. Some participants' responses are shown below.

- I was thrilled about getting the coupons from my tutor. She said if I improve my grade on the exam, she will give me $50 Starbucks coupons. I did it, and I received my rewards. Looking back, I was concentrating during the lesson.
- I got a small gift for answering questions during class, and I felt great. After that, I was involved in class.

However, when students clarified whether their grades had significantly improved, most said they were more or less the same as before they took the online class, with the exception of some subjects, such as liberal studies. One student expressed that his English and Chinese grades had dropped after a recent exam, and he mentioned that languages were difficult to learn through online classes, especially English. He could not use it with his peers in class, and he believed this was the reason that his English grade had deteriorated. Therefore, online learning may not be useful for students who would like more interaction.

Future Trends in Shadow Education

Responses from tutors on this topic were almost the same. They all believed that in the near future, shadow education will follow mainstream schools to the use of online software. They further provided several reasons for online shadow education. First, the COVID-19 situation will remain for quite a while, and no one can predict the day that we will be free from the pandemic. Second, shadow education works under mainstream schools (Bray, 1999), and that is why shadow education may need to be synchronized with those schools. Lastly, online shadow education can help break barriers. Students from different countries can attend lessons at the same time, and this can be an oppor-

tunity for some learning centers to expand their business. From the tutors' perspective, this method of teaching will remain even after COVID-19 is no longer a serious issue.

As for the students, they also agree that this will be a future trend in education. Although some still questioned the effectiveness and efficiency of the practice, there is no doubt that online classrooms have made education more convenient. This parallels the tutors' statements about the convenience of online education. Students could attend the lesson whenever and wherever they wanted, and this allowed them to make good use of their time. However, they also pointed out that in order to make this happen, teaching quality, technical issues and privacy issues should receive further attention. However, generally speaking, online learning will be the future of shadow education.

Discussion: General Impressions from Tutors and Students

This paper primarily focuses on general impressions of online shadow education, and both private tutors and students expressed positive feedback regarding this method of instruction.

As mentioned in Yung (2020), students felt comfortable with online learning because they neither needed to attend school in person nor reveal their identities. This provided both positive and negative impacts. Students were more outgoing in online classes, but the teachers were unable to fully control whether their students were listening during the lesson (Yung, 2020). In this research, the students indicated that they felt safe and comfortable with having their lessons at home. Some did feel that online tutoring was more 'distant' than 'intimate', but they mentioned that because their mainstream schools had provided prior online instruction, they had no problem with learning through Zoom. The factor that negatively affected their impressions was their tutor's teaching strategies. It is worthwhile to dig deeply into teaching methods for online shadow education, as it is likely that the most effective will be different from those utilized in face-to-face learning. In the U.S.A., schools and learning centers have developed a set of new curricula and teaching methods, such as collaborative blackboard, in response to the COVID-19 situation (Netolicky, 2020). Teaching strategies should be reflected upon and evaluated every semester, and new methods, such as games, competitions and rewards, can be implemented to attract students.

As for the tutors' perspectives, they provided both positive and negative impressions of online shadow education. As mentioned in the findings, the tutors stated that success in an online tutorial class is dependent upon the student's attitude. For example, if students decide not to respond to questions or fake their presence, they may not gain any benefit from online private tutoring. However, those who demonstrated commitment and stayed involved by, for example, answering questions, were more likely to have learnt something from their tutors. As a result, tutors were not fully sold on the online methods of teaching, and they still believed that traditional face-to-face lessons would be more effective. These concerns can be somewhat related to previous research results from Bray (2011), Yung (2020) and Cheng (2021), all of which are related to helping students benefit from private tutoring. As Yung (2020) concluded, it can be somewhat difficult to maintain discipline and ensure that students are paying attention in class when one is utilizing online teaching methods.

However, tutors also expressed positive impressions of online tutorial classes. Some used economic terms, such as stating that they were able to gain income by conducting online classes throughout the pandemic. Due to the strict social distancing policy in Hong Kong, schools were forced to stop face-to-face classes for almost six months. Some private learning centers went out of business because of the pandemic (South China Morning Post, 2020). The emergence of online tutorial classes allowed many tutors to keep their jobs, which is why, from an economic point of view, they support online shadow education. Some of the tutors in this research explicitly expressed that online shadow education can help break barriers and that it has completely changed the world of education. It is noteworthy to hear this belief expressed by tutors, who are major stakeholders in this industry. They generally agreed that online classes in the private tutoring sector can help students learn and revise knowledge at any place or time. Students may participate in the class on live stream or view a recorded session at a later time, depending upon the students' needs, or they may do both. This is a huge benefit and convenience for students, as retention depended almost solely on jotting down notes in the past. As a result, the tutors also expressed positive impressions of online shadow education.

Although there are some benefits in using online platform as a way to conduct shadow education, a more considerate guidelines or government supports are needed in Hong Kong. Currently hagwons (private lessons) in Korea have also switched to online platforms, and scholars indicated that government should provide more supports, such as laws and regulations for private tutors to follow when conducting their classes online (Piao & Hwang, 2021). In Hong Kong, online teaching has not received a lot of supports from government, but using Zoom as one of the main methods in teaching has become a trend because of COVID-19. More can be done in terms of supporting online shadow education in Hong Kong.

Areas that Require Further Attention

During online tutoring, most of the participants (both tutors and students) agreed that teaching strategies, privacy issues and creating online teaching materials were some of the areas to which tutors need to pay more attention.

This research shows that teaching strategies were critical, especially because the relationship between tutors and students was distant. Using online software to conduct lessons may result in students being distracted by the surrounding environment or playing with their phones while attending lessons. These distractions were observed in each of the three lesson observations in this study. All students, at some point in the observation, bowed their heads and appeared to stop paying attention to the lecture. During the group discussions, some students also pointed out that interesting teaching methods and rewards can attract their attention and motivate better performance in future lessons. As a result, the methods utilized in online teaching are the first aspect that tutors need to priorities. Some of the suggested methods, such as using Kahoot or the Zoom polling system, can help make the lesson more unorthodox and interesting. Also, the tutors suggested trivia questions and question-and-answer interactions to keep students involved in the online classes.

Privacy issues were addressed by both tutors and students in this study. Tutors mentioned that they used a virtual background to hide where they were and to help them feel more secure. Students, on the other hand, tended to shut off their cameras unless their tutor requested that they switch it on. The students' behavior in this study was similar to that of the participants in Yung's (2020) research. They would feel more comfortable in an online class, and they would be more expressive because of the camera. Going forward, tutors who would like to choose online software as their primary mode of teaching should understand the associated privacy risks. A virtual background or strategically switching the camera on and off should be carefully considered for integration into the lessons, as various kinds of background information may risk a leak of the tutor's or student's information, including age, gender or full name (Kagan et al., 2020). Another issue that can happen in online teaching is the sudden or accidental appearance of strangers who crash the meeting. Although this was not addressed by participants in this research, these surprising appearances are related to online teaching's privacy issues. Recent research conducted by Kagan et al. (2020) mentioned the risks associated with leaks of personal information or video conference links to the public. If the latter occurs, strangers can suddenly appear in the session and expose disturbing materials to the users. This is another issue to which tutors who plan to use online education should pay attention.

Finally, a new set of online materials that are suited to the current pandemic situation needs to be created. An example used in a previous section is that some schools and learning centers in the United States have recently developed a set of online learning materials for students to use during the pandemic (Netolicky, 2020). In this research, the students were given some online materials, such as online worksheets or textbooks, to enhance their learning. Since the COVID-19 situation remains uncertain, online teaching may need to be widely used for some time. For tutors, it is necessary to develop a set of new Internet-based learning and teaching materials for online shadow education. This will ensure the teaching quality of the lesson and reduce pressure on the tutor. Additionally, online shadow education materials should be synchronized with those of mainstream schools. This synchronization also fulfils a primary function of shadow education: to work in integration with mainstream schools (Bray, 1999). Therefore, updated online materials are needed for tutors to stay competitive, maintain teaching quality and successfully assist their students' learning.

Future of Online Shadow Education in Hong Kong

Online education in both mainstream and private tutorial schools is now quite popular in Hong Kong, but only a few studies have discussed the effectiveness of online private tutoring. This research showed that the general impressions of students and tutors regarding online shadow education were uncertain. Although some think this is the future of education and its convenience can help students learn, others challenge whether students can really learn at all through a screen. However, researchers and educators should assume that online shadow education will become even more popular in the future. It is quite difficult to turn back to traditional methods, as convenience and breaking barriers are very attractive to students and some tutors. Therefore, online shadow education is a method that is worth further investigation and discussion in the future

(Eng, 2019). Some of the participants in this study indicated that the future trend in the private tutoring field will be a combination of online and face-to-face work, which can be called a 'hybrid' mode of teaching and learning. Teachers can use Zoom and face-to-face teaching at the same time, while students can attend face-to-face lectures or live stream from home. This combination is the future for the Hong Kong private tutoring sector and is likely a trend for shadow education around the globe.

Moreover, tutors in this research mentioned that online shadow education can break barriers. Online classes have already begun to provide opportunities for tutors since learning centers can now accept students from around the world. Economically speaking, this can bring a large amount of income to tutors and learning centers. As a result, when talking about the future of online shadow education in Hong Kong, some of the tutors in this study expressed optimism about the future of their profession.

Conclusion and Limitation

In conclusion, this research has highlighted that online shadow education will very likely be the future for the private tutoring industry in Hong Kong, as most of the participants in this research expressed a positive impression of the convenience of using online private tutoring. For tutors, this type of teaching can help them maintain their jobs and is a more suitable approach to teaching during a pandemic. Although there were a few worries about the effectiveness of online shadow education, these can be solved through teaching strategies and the development of updated online materials and curricula. Some of the findings were related to Yung's (2020) study; for example, the students felt more comfortable and expressive while participating in Zoom learning. They were more willing to express themselves because they did not need to reveal their faces and identities. However, this study does not reflect only students' impressions of online shadow education. As a result, the data and implications of this study illustrate some of the trends in shadow education in Hong Kong.

Further research is needed on online shadow education, as too few scholars have focused on this area. In this research, students and tutors only expressed their general impression of online shadow education; however, the results of online shadow education, such as whether students have significantly improved after completing a session, have not been adequately examined. This research was limited to the perspectives of students and private tutors, which may not be a wide enough sample to show the whole picture of online shadow education in Hong Kong. More stakeholders should be involved in this type of research in the future, such as government representatives, parents, school teachers, policymakers and any others who take part in online shadow education, as more ideas from these stakeholders can help to paint a more complete picture (Bray, 2014). Therefore, future researchers should consider online shadow education to be one of the branches of shadow education study, and they should investigate various topics within this field in order to help educators in Hong Kong and around the world.

Furthermore, this research may only reveal some of the potential issues happened in Hong Kong shadow education, as online education can still have a lot of areas that can be discussed, such as potential governmental supports in Hong Kong shadow education and the reasons that students felt more comfortable in staying behind the

camera. Those are some of the factors that can be included in future studies, and it is a limitation of this paper as well.

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APPENDIX A: SAMPLE INTERVIEW QUESTIONS

Questions for the pre-interview

1. *Have you ever attended online lessons?*

Questions for the interview

1. *What are your impressions of online private tutoring? Do you think it is useful? Why?*
2. *What teaching strategies did you use during online teaching? Why? (Tutor)*
3. *What are some of the difficulties that you faced during online private tutoring? Please explain in detail.*
4. *Are you motivated in an online private tutorial class? Why?*
5. *Did you feel you had significantly improved your/your student's academic results after the online classes? Why?*
6. *Do you think online private tutoring is useful? Can this become a trend?*

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ORIGINAL ARTICLE

The Effect of School Organizational Support on Job Satisfaction of Primary and Secondary School Teachers: The Mediating Role of Teachers' Engagement in Educational Research

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***Abstract**: The topic of teacher work satisfaction has long been a focus of educational study. This study examined the impact of school organizational support on teacher job satisfaction as mediated by teachers' engagement in educational research, utilizing the findings of a survey on the academic quality of basic education students in Jiangsu Province in 2020 and analyzing the data of 21,154 primary and 16,585 secondary school teachers. In this work, the structural equation model is utilized. Significant favorable relationships are shown between school organization support, teachers' participation in educational research, and teachers' work happiness. The engagement of teachers in educational research somewhat mediates the relationship between school organization support and teacher job happiness. School organization support positively predicts teacher job satisfaction. The impact of school organization support on teachers' participation in educational research and job satisfaction is greater at the primary level than at the junior secondary level.*

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***Keywords**: Teacher Educational Research, Teacher Job Satisfaction, School Organizational Support, Mediating Effect*

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Introduction

IN China, the educational research system is an inherent aspect of the basic education community, intended to support the professional development of teachers, the enhancement of the quality of basic education, and the complete development of students (Shen & Yang, 2019; Liang et al., 2016). Cheng (2014) contends that the exceptional performance of Chinese students on the Program for International Student Assessment (PISA) is attributable in part to the systematic and frequent educational research conducted by instructors, which is difficult to achieve in other nations. However, the phenomenon of "resistance to research" among instructors occurs as a result of problems produced by the excessive pursuit of rapid research findings, such as intense workload, unclear objectives, inadequate financing, and a rigid management system (Shao, 2012; Luo, 2008; Yang, 2018). Consequently, teacher education research has become a two-edged sword. How may educational research help the job happiness of educators? Few studies have done in-depth analyses of the relationship between school organizational support and teacher job satisfaction from the standpoint of teacher education research. Consequently, we use the results of a survey on student academic quality in Jiangsu Province's basic education to investigate the relationship between school organizational support, teachers' participation in scientific research, and teacher job satisfaction. The study adopts the structural equation model in order to provide a theoretical framework and empirical basis for the application of organizational support theory to the discussion of teacher educational research and job satisfaction, as well as to provide insights for the promotion of teacher educational research and the enhancement of teacher professional satisfaction.

A Literature Review

The Influence of School Organizational Support on Teachers' Job Satisfaction

The organizational support theory combines organizational anthropomorphism, expectation theory, and the social exchange idea. The theories of organizational support and employee perception of organizational support and appropriate measuring scales were developed by Eisenberger et al. in 1986. In their meta-analysis, Rhoades and Eisenberger (2002) contend that there is a strong positive relationship between organizational support and worker job satisfaction, enthusiasm, and output. Chinese scholar Xu gives his concepts of organizational support and perceived organizational support in a Chinese context based on their prior research (Xu et al., 2005).

Organizational support is a fundamental aspect of school administration. In their research study, Rhoades and Eisenberger (2002) conclude that perceived organizational support of employees can increase employee job satisfaction and promote other beneficial job-related behaviors. When teachers perceive adequate organizational support and concern for their well-being, their job security and general contentment will increase. Improved teacher job satisfaction promotes a heightened sense of accountability for instructional outcomes (Ji & Zhao, 2021; Hakkak et al., 2014; Bogler & Nir,

2010). El-Hilali and Al-Rashidi (2015) discover that organizational support (including professional development, reasonable workload, and equitable distribution of educational resources) is one of the most influential factors on job satisfaction among female primary school teachers in their study of female primary school teachers. Meng (2019) finds a substantial positive association between job satisfaction and organizational support for Dalian's junior secondary physical education teachers. Similarly, Ji (2020) indicates that the perception of organizational support can predict significantly the job satisfaction of primary and secondary school teachers in Tibet. Thus, we propose two hypotheses:

H1a: At the primary level, school organizational support exerts a positive influence on teacher job satisfaction.

H1b: At the junior secondary level, school organizational support has a positive effect on teacher job satisfaction.

The Impact of School Organizational Support on Teachers' Engagement in Scientific Research

Teacher educational research, as defined by You (2018), is a collection of theoretical and practical educational exploration activities, including regular teaching research, participation in major research projects, and educational paper writing, undertaken by teachers to investigate the causes and solutions to problems in schooling as well as the universal patterns of education and teaching. China's distinctive educational research system plays a crucial role in implementing the state's curriculum reform and fostering the professionalism of teachers. In the 1950s, in order to ensure the quality of education, local departments of education established educational research offices and recruited a group of outstanding teachers from schools to serve as teaching research staff in order to instruct in-service teachers in syllabus study, teaching material compilation, and lesson planning. In light of the relatively low educational levels of teachers at the time, the development of educational research offices at all levels was a crucial step toward standardizing the quality of classroom instruction (Gu, 2014). The school-based educational research offices have contributed to the general improvement of the quality of school education by resolving problems in teaching, summarizing and sharing valuable practical teaching experience, and supervising the quality of school teaching (Yin et al., 2020). The Several Opinions of the State Education Commission on Improving the Performance of Teaching Research Offices were announced in 1990 in an effort to standardize the criteria for educational research and the functions of related organizations. Since China's reform and opening up, this is the first official document issued by the Ministry of Education to improve educational research, signaling the beginning of institutionalization and standardization of the educational research system (State Education Commission, 2012; He, 2020).

To fulfill the ever-increasingly complex demands of contemporary society on teachers, schools must cultivate their own motives for sustained professional growth (Yarmakeev, 2019). Shore and Wayne (1993) found an association between organizational support and the positive work behavior of employees. Additionally, several studies have indicated that perceived organizational support can dramatically increase employees' proactive work involvement (Cleveland & Shore, 1992; Rhoades &

Eisenberger, 2002). When school organizational support offers teachers with effective aid in their educational research efforts, involvement will increase dramatically (Xu et al., 2013; Zhou et al., 2019). This study therefore proposes the following hypotheses:
H2a: At the primary level, school organizational support has a positive effect on teachers' participation in educational research.
H2b: At the junior secondary level, school organizational support positively affects teachers' engagement in educational research.

The Effect of Teachers' Engagement in Educational Research on Job Satisfaction

While some scholars suggest that teachers' participation in educational research may increase their workload or possibly lead to career burnout (Luo, 2008; Yang, 2018), others contend that encouraging teachers' professional growth might improve their job satisfaction (Guskey & Yoon, 2009). Scientific research activities that contribute to addressing practical teaching challenges, understanding curricular content, and boosting self-efficacy can considerably improve teacher work satisfaction (Xue, 2006; Shao, 2012; Avalos, 2010). Creative research allows teachers to see novelties in their job rather than boring repetitions, which effectively alleviates negative emotions such as inactivity, exhaustion, and indifference (Sukhomlinsky, 2009). As a result, we raise the two hypotheses below.
H3a: At the primary level, teachers' participation in educational research has a positive impact on teacher job satisfaction.
H3b: At the junior secondary level, teachers' engagement in educational research is positively correlated with teacher job satisfaction.

A Summary of the Literature Review

Previous studies have demonstrated that teachers are motivated not only by money and spiritual benefits but also by job satisfaction. Despite this, relatively few studies have examined the links between school organizational support, teachers' participation in educational research, and teacher job satisfaction. However, the above analysis of the relationship between school organizational support, teachers' engagement in scientific research, and teacher job satisfaction suggests that there may be a correlation between the three variables: school organizational support has a direct effect on teacher job satisfaction and can also influence teacher job satisfaction via the mediating effect of teachers' engagement in educational research.

Data and Methodology

Sources of Data

The 2020 survey findings on the academic quality of Jiangsu Province's basic education students serve as our data source. Initiated in 2006, the survey chooses primary and high school students and instructors from around the province for testing and inquiry, resulting in a large sample size and authoritative results (Chen, 2020). Before the inves-

tigation and testing, the survey in 2020 selected a series of study themes and dimensions, and sampling was conducted in two stages. The student sample consisted of fifth and ninth graders; the teacher sample consisted of the class teachers and English, Chinese, and mathematics teachers of the sampled students; and the school leadership sample consisted of the sampled students' principals (including the principals and vice principals). As a result, the student, teacher, and leadership databases for primary and secondary schools were created. The survey was conducted in two phases. In the first phase, the trial test and questionnaire modification were conducted, and in the second, the province-wide uniform survey was conducted. Prior to the survey, the team engaged a group of education management and education assessment specialists to conduct semantic analysis and expert validity evaluation of the questionnaires. Based on the outcomes of the experts' evaluations, the questionnaires were improved. The survey team then conducted a pilot test of student, teacher, and principal questionnaire content in X City, Jiangsu Province. According to the results of the reliability and validity study of the trial questionnaires, irrelevant questions were eliminated from the final version of the province-wide uniform survey questionnaires for the second stage. After the second stage of the provincial unified survey, the questionnaires' dependability and validity were evaluated again. After eliminating the problematic items, the research-relevant subjects and dimensions were identified. The current study selects data from the teacher questionnaire survey findings. Data for 21,154 primary school teachers and 16,585 junior secondary school teachers were obtained after sorting and screening. In **Tables 1** and **2**, descriptive statistics and variable descriptions are illustrated.

Research Tools

This empirical investigation focuses primarily on five dimensions: school organizational support; teachers' cognitive engagement in educational research; teachers' emotional engagement in educational research; teachers' behavioral engagement in educational research; and teachers' job satisfaction.

School Organizational Support Questionnaire

The six survey items on this questionnaire are graded on a six-point Likert scale, with 1 denoting "strongly disagree" and 6 denoting "strongly agree." The more points are received, the greater school support instructors believe they receive for participating in educational research initiatives.

Teacher's Educational Research Participation Questionnaire

It has 12 survey items in three dimensions and uses a Likert scale with a maximum of five points (1 for "non-conforming" and 5 for "conforming"). Teachers are more likely to participate in educational research if they score high.

Teacher's Job Satisfaction Questionnaire

Table 1. Descriptive Statistics.

	Variable names	Primary Schools (N=21,154)				Junior Secondary Schools (N=16,585)			
		Mean	SD	Min	Max	Mean	SD	Min	Max
Teacher Charact.	Gender-male	0.180	0.388	0	1	0.300	0.457	0	1
	Length of service	15.870	10.972	0	44	19.290	9.654	0	44
	Position	2.540	0.816	1	5	2.980	0.800	1	5
	Educational level	2.980	0.332	1	4	3.070	0.316	1	4
	Marital status-married	0.820	0.386	0	1	0.910	0.291	0	1
	Concurrent administrative post-Yes	0.650	0.477	0	1	0.500	0.500	0	1
	Subject-Chinese	0.432	0.495	0	1	0.333	0.471	0	1
	Subject-Mathematics	0.318	0.466	0	1	0.330	0.470	0	1
School Charact.	Ownership-public	0.950	0.216	0	1	0.850	0.355	0	1
	School in the city	0.610	0.488	0	1	0.628	0.483	0	1
	School in the town	0.345	0.475	0	1	0.330	0.470	0	1
	School in South Jiangsu Prov.	0.448	0.497	0	1	0.432	0.495	0	1
	School in North Jiangsu Prov.	0.388	0.487	0	1	0.363	0.481	0	1

SD: Standard Deviations; Min: Minimum Value; Max: Maximum Value; Charact: Characteristics; Prov.: Province.

It consists of four survey items scored on a five-point Likert scale (from 1 to 5, with 1 denoting "strongly disagree" and 5 denoting "strongly agree"). The higher the score, the more satisfied teachers are with their jobs.

Reliability and Validity Tests

The findings of model reliability and validity assessments at the primary and junior secondary levels are reported in **Tables 3** and **4**, respectively.

School Organizational Support

School organizational support in this study refers to the school's support for teacher participation in educational research initiatives. This component is represented by six survey items in the 2020 teacher questionnaire. According to the factor analysis, the KMO test scores at the primary and junior secondary levels are 0.932 and 0.924, respectively, which meet the requirements. The Cronbach's α coefficient of school organization support at the primary and junior secondary levels are 0.956 and 0.945, respectively, showing that the questionnaire is reliable and valid. In confirmatory factor analysis, the range of SMC of school organization support at the two stages is 0.654-0.884 and 0.598-0.846, respectively, with CR 0.960 and 0.947, AVE 0.802 and 0.750, CFI 0.976 and 0.972, TLI 0.960 and 0.953, and RMSEA 0.014 and 0.063, showing strong goodness of fit of this dimension.

Table 2. Variable categories and descriptions

Variable	Variable Name	Descriptions
Teacher Charact.	Gender-male	1=male，0=female; a dummy variable; females as the control group.
	Position	1=the third level，2=the second level，3=the first level，4=senior，5=ultra-senior
	Educational level	1=senior secondary(technical secondary and secondary normal schools)，2=junior college，3=bachelor degree，4=master degree
	Length of service	A continuous variable; the value representing years of service.
	Marital status-married	1=married，0=unmarried; a dummy variable; the unmarried as the control group.
	Concurrent administrative post-Yes	1=Yes，0=No; a dummy variable; those without concurrent posts as the control group.
	Subject-Chinese	1=Chinese language teacher，0= non-Chinese language teacher; a dummy variable; English teachers as the control group.
	Subject-Mathematics	1=maths teacher，0=non-maths teacher; a dummy variable; English teachers as the control group.
Charact. of Corresponding Schools	Ownership-public	1=public school，0=private school; a dummy variable; private schools as the control group.
	School in the city	1=school in the city，0=school outside the city; a dummy variable; schools in villages as the control group.
	School in the town	1=school in the town，0=school outside the town; a dummy variable; schools in villages as the control group.
	School in South Jiangsu Prov.	1= school in South Jiangsu Prov.，0=school outside South Jiangsu Prov.; a dummy variable; schools in Central Jiangsu Prov. as the control group.
	School in North Jiangsu Prov.	1= school in North Jiangsu Prov.，0= school outside North Jiangsu Prov.; a dummy variable; schools in Central Jiangsu Prov. as the control group.

Charact: Characteristics; Prov.: Province.

Teachers' Cognitive Engagement in Educational Research

Four survey items, based on data from the teacher survey, assess teachers' cognitive participation in educational research. The Cronbach's α coefficients for teachers' cognitive participation in educational research at the primary and junior secondary levels are 0.886 and 0.884, respectively, showing the questionnaire's reliability and validity. In confirmatory factor analysis, the range of SMC for teachers' cognitive engagement in educational research at the two stages is 0.483-0.753 and 0.479-0.753, the CR is 0.892 and 0.891, the AVE is 0.675 and 0.673, the CFI is 0.982 and 0.987, and the RMSEA is 0.074 and 0.065, indicating that this dimension has a good fit.

Teachers' Emotional Engagement in Educational Research

Table 3. The Test of Model Reliability and Validity at the Primary Level.

Dimensions		Cronbach' α	SMC	CR	AVE	CFI	RSMEA
1st order	School organizational support	0.956	0.654-0.884	0.960	0.802	0.976	0.014
	Teachers' cognitive engagement in educational research	0.886	0.483-0.753	0.892	0.675	0.982	0.074
	Teachers' emotional engagement in educational research	0.895	0.587-0.796	0.899	0.690	0.979	0.056
	Teachers' behavioral engagement in educational research	0.894	0.573-0.810	0.900	0.694	0.987	0.056
	Teacher job satisfaction	0.781	0.323-0.781	0.796	0.501	0.986	0.054
2nd order	Teachers' engagement in educational research		0.741-1.040	0.947	0.857	0.927	0.064
Testing standards		> 0.7	> 0.3	> 0.7	> 0.5	> 0.9	< 0.08

Table 4. The Test of Model Reliability and Validity at the Junior Secondary Level.

	Dimensions	Cronbach' α	SMC	CR	AVE	CFI	RSMEA
1st order	School organizational support	0.956	0.598-0.846	0.947	0.75	0.972	0.063
	Teachers' cognitive engagement in educational research	0.886	0.479-0.753	0.891	0.673	0.987	0.065
	Teachers' emotional engagement in educational research	0.895	0.591-0.767	0.899	0.69	0.976	0.068
	Teachers' behavioral engagement in educational research	0.894	0.578-0.812	0.894	0.679	0.99	0.054
	Teacher job satisfaction	0.781	0.305-0.790	0.786	0.487	0.986	0.059
2nd order	Teachers' engagement in educational research		0.697-1.038	0.941	0.843	0.926	0.064
Testing standards		> 0.7	> 0.3	> 0.7	> 0.5	> 0.9	< 0.08

The data on teachers' emotional engagement in educational research came from a four-item survey administered via a teacher questionnaire. The Cronbach's α coefficients for primary and junior secondary teachers' emotional engagement in educational research are 0.895% and 0.891%, respectively, suggesting the questionnaire's reliability and validity. In confirmatory factor analysis, the range of SMC for teachers' emotional participation in educational research at the two stages is 0.587-0.796 and 0.591-0.767, the CR is 0.899 and 0.899, the AVE is 0.690 and 0.690, the CFI is 0.979 and 0.976, and the RMSEA is 0.056 and 0.068, indicating that this dimension is well-fitting.

Teachers' Behavioral Engagement in Educational Research

For the dimension of teachers' behavioral participation in educational research, which is examined under four items, data are taken from the teacher questionnaire. At the primary and junior secondary levels, the Cronbach's α coefficients of teachers' behavioral participation in educational research are 0.894 and 0.912, respectively, indicating strong reliability and validity of the questionnaire. The range of SMC for teachers' behavioral involvement in educational research at the two stages in confirmatory factor analysis is 0.573–0.810 and 0.578–0.812, respectively, with CR 0.900 and 0.894, AVE 0.694 and 0.679, CFI 0.987 and 0.990, and RMSEA 0.056 and 0.054, indicating good goodness of fit for this dimension.

Teachers' Engagement in Educational Research

Teachers' participation in educational research is a second-order latent variable in this study that is obtained from their cognitive, emotional, and behavioral involvement. The range of SMC for teachers' participation in educational research at the primary and junior secondary levels is 0.741-1.040 and 0.697-1.038, respectively, with CR of 0.947 and 0.941, AVE of 0.857 and 0.843, CFI of 0.927 and 0.926, and RMSEA of 0.064 and 0.064. It demonstrates how well the model of teachers' involvement in educational research fits the data and how it can be used as the main mediating factor in this investigation.

Teacher Job Satisfaction

In this study, the main dependent variable is teacher job satisfaction. Data for this dimension is taken from the teacher's questionnaire, which is broken down into four items. At the primary and junior secondary levels, the teachers' job satisfaction Cronbach's α coefficients are 0.781 and 0.771, respectively, indicating good validity and reliability of the questionnaire. The range of the SMC in the confirmatory factor analysis is 0.323-0.781 and 0.305-0.790, CR is 0.796 and 0.786, AVE is 0.501 and 0.487, CFI is 0.986 and 0.986, and RMSEA is 0.054 and 0.059, respectively. All components are adequate, indicating a good goodness of fit for the model of teacher work satisfaction, with the exception of the AVE value at the junior secondary level, which is marginally below the standard.

The common method biases of all self-assessment items are tested in this study using confirmatory factor analysis after reviewing the study by Liu et al. (2019). With CFI = 0.572, GFI = 0.418, RMSEA = 0.197 at the primary level and CFI = 0.556, GFI = 0.443, RMSEA = 0.191 at the junior secondary level, the results show that the model has a low goodness of fit. Therefore, this study does not exhibit any significant common method biases.

Research Results and Analyses

The Interaction between School Organizational Support, Teachers' Engagement in Educational Research and Teacher Job Satisfaction

Table 5. Overall Reliability and Validity Indicators of the Structural Model.

Education Levels	Primary level				Junior secondary level			
Indicators	CFI	RMSEA	GFI	TLI	CFI	RMSEA	GFI	TLI
Values	0.952	0.067	0.913	0.946	0.947	0.067	0.911	0.940
Standards	> 0.9	< 0.08	> 0.9	> 0.9	> 0.9	< 0.08	> 0.9	> 0.9

Table 6. The Path Analysis.

Paths	Primary level					Junior secondary level				
	Est.	S.E.	C.R.	P	Std.	Est.	S.E.	C.R.	P	Std.
TEER←SOS	0.189	0.003	63.007	***	0.475	0.156	0.003	47.841	***	0.410
TJS←SOS	0.407	0.006	64.471	***	0.542	0.356	0.006	55.302	***	0.523
TJS←TEER	0.311	0.014	22.075	***	0.165	0.243	0.015	16.024	***	0.135

Notes: 1) TEER=teachers' engagement in educational research; SOS= school organizational support; TJS=teacher job satisfaction
*2) *P < 0.05. **P < 0.01. ***P < 0.001.*

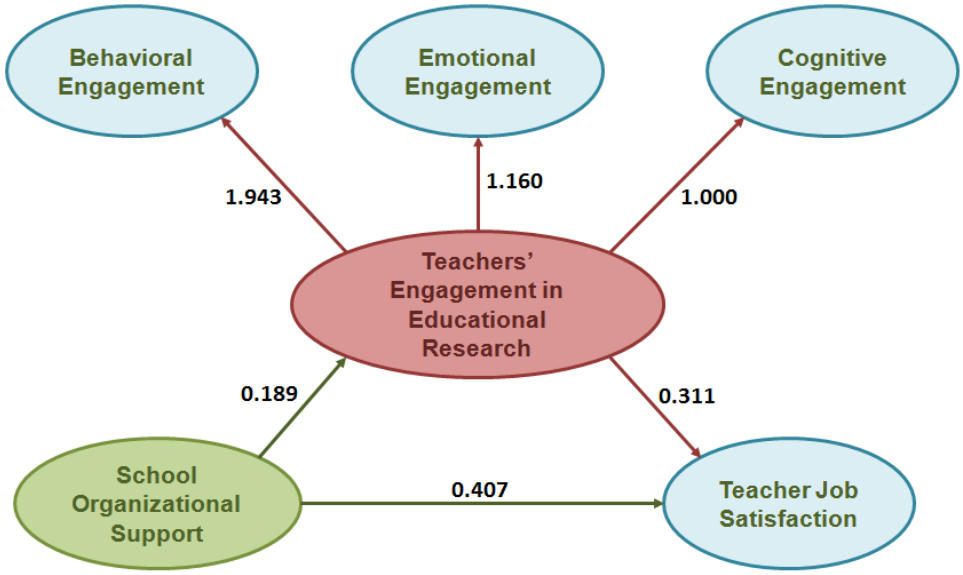

Figure 1. The Path Analysis at the Primary Level.

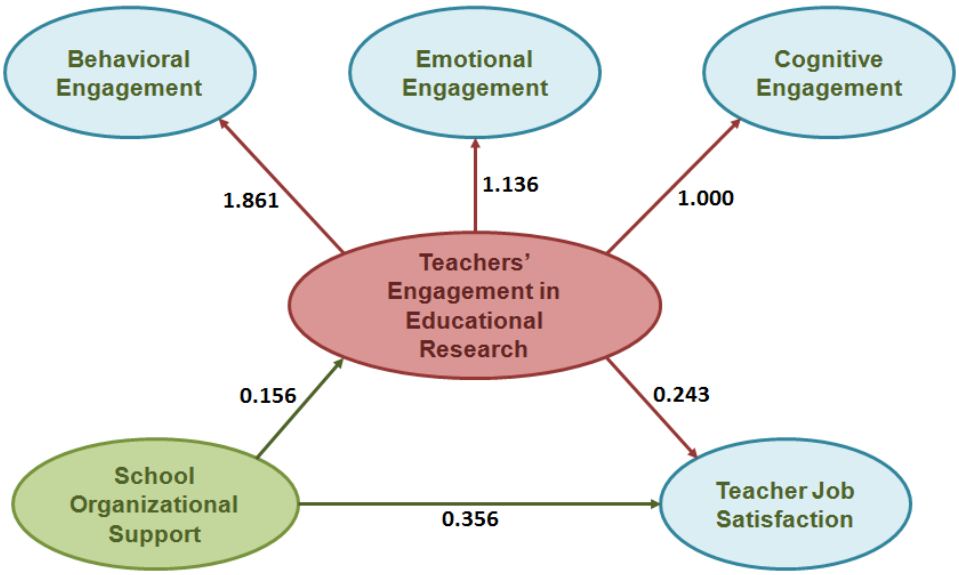

Figure 2. The Path Analysis at Junior Secondary Level.

In this work, the variance maximum likelihood technique is used to estimate the structural equation model's parameters in order to determine the structural model's overall reliability and validity indicators (**Table 5**).

As shown in **Table 5**, the CFI of the structural model at the primary and junior secondary levels is 0.952 and 0.947, the RMSEA is 0.067 and 0.067, the GFI is 0.913 and 0.911, and the TLI is 0.946 and 0.940, indicating that the model is well-fitting.

As shown in **Figure 1** and **Table 6**, at the primary level, school organizational support increases teacher job satisfaction significantly and positively (Std. = 0.542, $P < 0.001$), validating hypothesis H1a. School organizational support has a considerable beneficial effect on teachers' participation in educational research (Std. = 0.475, $P < 0.001$), confirming hypothesis H2a. The participation of teachers in educational research has a significant beneficial effect on teacher job satisfaction (Std. = 0.165, $P < 0.001$), validating hypothesis H3a.

School organizational support had a considerable beneficial effect on teacher job satisfaction at the junior secondary level (Std. = 0.523, $P < 0.001$), corroborating H1b. H2b is supported since school organizational support promotes teachers' engagement in scientific research significantly and positively (Std. = 0.410, $P < 0.001$). Teachers' participation in educational research had a significant beneficial effect on teacher job satisfaction (Std. = 0.135, $P < 0.001$), corroborating H3b (**Figure 2**).

The preceding conclusions are similar to those of prior investigations (Shore & Wayne, 1993; El-Hilali & Al-Rashidi, 2015; Tang, 2018; Ji, 2020; Ji & Zhao, 2021). Researchers discovered that teachers identify their importance to the school through spiritual and professional support as well as material support, such as professional

recognition and respect from the school, easy access to information, reasonable salaries and promotion, and other benefits that help teachers do their jobs better (Rhoades & Eisenberger, 2002; Yang et al., 2022). Because of the principle of reciprocity, perceived school organizational support motivates teachers' loyalty to the school's development and readiness to assist the school in attaining its goals, resulting in increased job satisfaction. Meanwhile, school organizational support strengthens teachers' emotional attachment to the school. The care, recognition, and respect inherent in school organizational support meet teachers' social and emotional needs and encourage them to integrate organizational membership and role status into their social identity, thus enhancing organizational success and improving job happiness. As a result, the school's genuine expression of recognition and respect for teachers' professionalism, as well as support for their teaching and research, might motivate them to participate in educational research and boost their job satisfaction.

The Test of Mediating Effect between School Organizational Support, Teachers' Engagement in Educational Research and Teacher Job Satisfaction

In this study, the 95% confidence intervals are constructed, bias correction (bias-corrected percentile 95% CI), and percentile regression (percentile 95% CI) are used. The Bootstrap method is used for the test of mediating effects and paths, and a random selection of 5,000 Bootstrap samples is conducted. **Table 7** displays the point estimates, Z-scores, and confidence intervals for each effect.

The test's results indicate: (i) At the primary stage, teachers' participation in educational research has a positive impact on their job satisfaction, with a mediating effect value of 0.058; the percentile and the bias-corrected 95% confidence intervals do not contain 0, with $P < 0.01$, which denotes a significant level of effect. It suggests that, at this point, the relationship between school organizational support and teacher job satisfaction is mediated by teachers' involvement in educational research. (ii) At the junior secondary level, teachers' participation in educational research has a positive impact on teacher job satisfaction with a mediating effect value of 0.038; the percentile and the bias-corrected 95% confidence intervals do not contain 0, with $P < 0.01$, indicating a significant level of effect. This indicates that, at this point, the relationship between school organizational support and teacher job satisfaction is mediated by teachers' involvement in educational research. (iii) The impact size at the primary stage is 0.466, with $P < 0.01$ indicating a substantial level of effect. Neither the percentile nor the bias-corrected 95% confidence intervals contain 0. It implies that partial mediation is the way to resolution at the primary school level. (iv) The overall effect size reaches 0.388 at the junior secondary level; the percentile and the bias-corrected 95% confidence intervals do not contain 0, and $P < 0.01$ denotes a substantial degree of effect. It implies that partial mediation is the appropriate path for mediation at this time.

The association between school organizational support and teacher job satisfaction in primary and secondary schools is significantly influenced by teachers' participation in educational research. We advance in this study by confirming that there is a mediating effect of teacher educational research on the relationship between school organi-

Table 7. The Test of Paths and Mediating Effects.

Paths and Effects	Estimated Values	Coefficient Products		Bootstrap method (5,000 times) 95% CI					
				Bias Correction			Percentiles		
		SD	Z-values	Lower	Upper	P	Lower	Upper	P
The Primary School Level									
Overall effects	0.466	0.008	58.250	0.451	0.482	***	0.451	0.481	***
Direct effects	0.408	0.008	51.000	0.392	0.424	***	0.392	0.424	***
Indirect effects	0.058	0.003	19.333	0.053	0.064	***	0.053	0.064	***
The Junior Secondary Level									
Overall effects	0.388	0.008	48.500	0.374	0.403	***	0.373	0.403	***
Direct effects	0.35	0.008	43.750	0.335	0.366	***	0.335	0.366	***
Indirect effects	0.038	0.002	19.000	0.033	0.043	***	0.033	0.043	***

*Note: *P < 0.05; **P < 0.01; ***P < 0.001.*

zational support and teacher job satisfaction at both the primary and secondary levels, despite some prior studies having found that school organizational support can influence teacher job satisfaction through organizational commitment, career commitment, and work burden alleviation (Tang, 2018). This suggests that schools can increase teacher job satisfaction by giving teachers the organizational support they need to conduct educational research (including emotional, practical, and informational support); by relieving their stress at work; by enhancing their positive emotional experiences; and by igniting their interest in doing so.

The study also found that in the primary and junior secondary levels, there are differences in the correlations between school organizational support, teacher involvement in educational research, and work satisfaction. Some earlier research investigated the topic either at the primary or junior secondary level, or they did not segment the samples from the various stages, making it difficult to draw comparisons between the two levels (Gu et al., 2020). Contrarily, the current study examines samples from both primary and junior secondary schools in order to enable comparative analysis, which indicates that organizational support in both primary and junior secondary schools has a positive impact on teacher educational research and job satisfaction, though the effect at the primary stage is more significant than that at the following stage. Additionally, this study finds that primary school teachers are more satisfied with their jobs than their counterparts at junior high schools, which is supported by studies by Shen and coworkers (2016) and Ding et al. (2018). Job burnout is inversely connected with teacher job satisfaction, and junior secondary school teachers' job burnout is strongly correlated with their workload (Zhang et al., 2014; Cai & Zhu, 2013). Teachers in junior secondary schools face more pressure from students' academic success than their counterparts in primary schools, which may account for their substantially poorer job satisfaction.

Conclusions and Limitations

Conclusions

We develop a theoretical model to describe the effect of school organizational support on teacher job satisfaction as mediated by teachers' engagement in educational research, using data from a survey of the academic quality of Jiangsu Province's basic education students conducted in 2020.

Our empirical investigation yields the following findings: (i) There is a strong and positive correlation between school organizational support and teachers' participation in educational research and work satisfaction at both the primary and junior secondary levels. (ii) School organizational support not only directly and positively predicts teacher job satisfaction but also indirectly influences teacher job satisfaction through the mediating effect of teachers' engagement in educational research. School organizational support influences teachers' engagement in educational research and teacher job satisfaction differently at the two stages, with a more pronounced effect at the primary level than at the junior secondary level.

Limitations

Future studies could benefit from further development. (i) This study examines the interaction between school organizational support, teachers' engagement in educational research, and teacher job satisfaction using only cross-sectional data. Since there are flaws in the analysis of causal effects using cross-sectional data, it is recommended that future research utilizes longitudinal data to further investigate the causal effect of school organizational support on teacher job satisfaction via the mediating role of teacher educational research. (ii) Throughout the course of teacher education research, there may be additional moderating variables influencing teacher work satisfaction (Guskey, 2002).Due to the survey's limited scope, this report cannot examine other mediating elements in the analysis, which will be the subject of subsequent research.

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ARTICLE

The Effect of Education Groups on the Quality of Urban and Rural Compulsory Education: An Empirical Analysis Based on CEPS Data

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Abstract: *We retrieved data from China Education Panel Survey (CEPS) and adopted the hierarchical linear model as well as the quantile regression method to examine the effect of education groups on the quality of urban and rural compulsory education. Student cognitive ability was cited as the evaluation index of education quality. According to the research findings, the overall effect of education groups on the quality of compulsory education is significantly positive, but there is urban-rural heterogeneity in this effect: the positive impact occurs only to urban member schools, while the education quality of rural member schools has not been improved by school grouping. In addition, there exists individual difference in this effect; school grouping significantly and negatively affects students from rural member schools and with medium and lower cognitive ability.*

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Introduction

The education group at the compulsory education level is a form of school association composed of a certain number of primary and/or junior secondary schools that are contractually tied to achieve scale effect. It is designed to expand access to high-quality educational resources through the alliance of advantaged and disadvantaged schools. An education group constituted by prestigious urban schools and ordinary rural schools is established to universalize the frontier educational concepts and school management skills of the former and to promote the balanced development of urban and rural compulsory education. Based on the data from the China Education Panel Survey (CEPS) 2013-2015, this study uses the hierarchical linear model (HLM) and quantile regression method to evaluate the effect of education groups on the quality of urban and rural compulsory education quality as well as on the development of cognitive competencies of students with differential cognitive levels. The purpose of this paper is to identify the specific effects of school grouping on bridging the quality gap between urban and rural schools and to optimize the strategies for education group operation.

Data Source

This study sampled students who participated in the CEPS baseline survey of 2013-2014 academic year and the follow-up survey of 2014-2015 academic year and drew the data of 6520 students from 88 schools. In the stage of baseline survey, they were in grade 7. Five of the sampled schools were members of education groups and contributed 316 students for this investigation, which accounted for 4.85% of the total sample of students. Further analysis showed that in the districts where the five schools are located, there are altogether 12 schools (715 students) included in the sample and that in this case, the portion of students from member schools of education groups was 44.20%.

Research Findings

Statistical Descriptions of Member Schools of Education Groups

According to the sample analysis results, students from member schools of education groups, compared with their peers from non-member schools, displayed considerably higher cognitive ability and featured a lower proportion of rural "registered residence" (Hukou) as well as a higher share of "the only child in the family". Member schools of education groups are more likely to be located in urban areas, with higher school rankings, stronger school finances, and higher teacher qualifications. Nonetheless, there were no remarkable differences in basic facilities and student-teacher ratio between member and non-member schools.

The Impact of School Grouping on Student Cognitive Ability

Full Sample Estimation

OLS regression analysis results showed that education group membership of the school had a significant positive effect on the development of student cognitive ability, while school location in rural areas has a remarkable negative influence on the cultivation of student cognitive ability. The incorporation of coefficients of interaction terms into the analysis confirmed the urban-rural heterogeneity in the impact of school grouping. School rural location weakened the marginal effect of school grouping by 0 334 units, which reversed the positive impact of 0.208 units contributed by the variable of school grouping (0.208-0.334 = -0.126). Consistent with the OLS estimation results, in the hierarchical linear model, the coefficient of the variable of school grouping was significantly positive, while those of school location and interaction terms are significantly negative. Moreover, a comparison of the coefficients indicated that the cognitive ability of rural students was not positively affected by the factor of school grouping, but rather declined (0.176-0.271 = -0.095).

Estimation of the Sample from the Districts Where Member Schools of Education Groups are located

The OLS regression analysis results of the sample from the districts where member schools of education groups are located also pointed to prominent urban-rural heterogeneity in the effect of school grouping. Overall, school grouping had a significant positive impact on student cognitive ability, but the coefficients of interaction terms demonstrated that the cognitive ability of students from rural member schools of education groups was remarkably lower than that of their urban counterparts by 0.914 units, which directly turned the overall positive influence of school grouping into a substantial negative impact (0.284-0.914 = -0.630). The hierarchical linear model also demonstrated high appropriateness. The result of chi-square test of zero model is significant. Disparities between schools accounted for about 27.1% of the gap in cognitive ability between students; Individual and family factors can partially explain the gap in student cognitive ability. The estimation results showed that the coefficients of the variable of school grouping and interaction terms are of significant levels, and there was positive-negative differentiation in their values. As a result, the influence of school grouping on rural students' cognitive ability was substantially negative (0.250-0.740 = -0.490).

The Influence of School Grouping on Different Student Cohorts

The regression coefficients of the variables of school grouping and interaction terms are significant at both the 25% and 50% quantiles. School grouping benefited urban students with below-average and medium cognitive ability (QR _25 and QR_ 50) more

than any other student cohort, by an improvement of 0.476 and 0.537 units. For rural students with these levels of cognitive ability (QR_25 and QR_50), the effect of school grouping is reversed to -0.643 (0.476-1.119) and -0.440 (0.537-0.977) units, which means that the development of rural students with medium or below-average cognitive ability was severely impaired by the school's membership in education group.

Discussion and Conclusion

The efficacy of education groups was confirmed by the research results in that the sharing of staff, curriculum content, and campus culture among member schools have helped increase student education output. The yearly teacher in-service training of member schools of education groups increased from 10.3 to 22 times on average, and its baseline level, follow-up level and growth rate were all higher than the averages of non-member schools in the same district; and the growth rate of teacher training of rural member schools has exceeded 300%, much higher than that of their urban counterparts.

Two types of costs should be taken into consideration in the exploration of the specific reasons for the heterogeneous effects of education groups on urban and rural compulsory education. (i) Explicit costs: in the practice of school grouping, urban member schools benefited from the sophisticated inner-city and inter-city transportation systems and ideal digital environments, which enabled the effective sharing of high-quality courses and the smooth rotation of excellent teachers and administrators. In contrast, due to the geographical separation and the "digital divide" between urban and rural areas, high-quality educational resources were less accessible to rural member schools. (ii) Implicit costs: During the two years of the CEPS, the sampled member schools of education groups were in the early stage of cooperation, experiencing a difficult transition from heterogeneity to homogeneity. The survey results of school satisfaction reflected the above costs in a direct way from the students' perspective. Students at rural member schools had a much higher level of academic weariness and stronger intention of school transfer than their urban counterparts.

This study drew the following conclusions: first, the education group has a significant positive influence on the quality of compulsory education and can effectively promote student cognitive ability; second, the influence of the education group is heterogeneous in urban and rural areas with the positive effect existing only among urban member schools, and the quality of compulsory education in rural member schools may decline rather than improve; and third, there is individual heterogeneity in the impact of school grouping, and the impact on rural students with medium and lower cognitive ability is the most significantly negative. The education group is a new form of school organization, and the association of urban and rural schools will progressively improve in practice and in mutual adaptation.

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ARTICLE

Factors Influencing the Turnover Intention of Rural Preschool Teachers in the Context of Rural Revitalization: An Analysis Based on a Moderated Mediation Model

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Abstract: *The retention of teachers is critical to the development of rural preschool education in China. We conducted a sample survey of 3790 rural kindergarten teachers from 22 counties (or cities) of 10 provinces and examined the effects of work stress and job apathy on the turnover intention of rural preschool teachers using the work stress, job apathy and turnover intention scales. According to the research findings, work stress can significantly predict rural kindergarten teachers' turnover intention; job apathy plays a mediating role between job stress and teacher turnover intention, and the indirect effect is greater than the direct effect; Bianzhi membership can moderate the direct effect of work stress on teacher turnover intention and the mediating effect of job apathy.*

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Keywords*: Rural Preschool Teacher, Turnover Intention, Work Stress, Job Apathy, Bianzhi, Membership*

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Conflict of Interests*: None.*

Introduction

The development of high-quality education is essential to rural revitalization and preschool education has a perennial effect on the overall development of rural students. A stable preschool teacher supply is an essential prerequisite for the progress of rural preschool education. Nevertheless, the loss of rural kindergarten teachers has become a prevalent concern of the community, and retaining preschool teachers in rural nursery schools is getting increasingly difficult. Numerous studies revealed that the high turnover rate of rural preschool teachers is mainly due to high job pressure and that heavy work burden leads to their negative emotional reactions. In addition, rural kindergartens employ a large number of teachers without Bianzhi (a system of officially budgeted posts in China) membership, who feel underpaid compared with their colleagues with the membership. Scholars have reached agreement that rural preschool teachers' turnover intention is affected by work pressure and job apathy as well as the disparity in Bianzhi membership among them. To further clarify the relationships among work pressure, job apathy, Bianzhi membership, and rural preschool teachers' turnover intention, this study used job apathy as a mediating variable and Bianzhi membership as a moderator variable to examine the effect of work stress on teacher turnover intention, with the objective of offering recommendations to policy makers on how to retain rural kindergarten teachers.

Research Methodology

The research team conducted a sample survey on rural kindergarten teachers from 22 counties (or cities) in China's10 provinces in August 2020, using online questionnaires. A total of 3,790 valid questionnaires were recovered. Rural preschool teacher work stress scale, job apathy scale, and turnover intention scale were adopted as measurement tools. SPSS24.0 and AMOS20.0 were utilized for data analysis, which followed four steps: first, to use Amos20.0 to test the common method biases between various research dimensions; second, to employ SPSS24.0 to test the reliability and validity of the teacher work stress scale, job apathy scale, and turnover intention scale; third, to construct structural equation modelling to test the direct and mediating effects among the variables of work stress, job apathy, and teacher turnover intention; and fourth, to use PROCESS to test the moderated mediation model.

Research Data

The Common Method Bias Test

There were no significant common method biases between the research dimensions, and the coefficient estimation incurs no errors affecting the authenticity of research results.

Convergent Validity, Composition Reliability and Discriminant Validity

There was a positive correlation between work stress and rural preschool teachers' turnover intention ($r = 0.568$, $p < 0.001$); work stress was positively related to rural preschool teachers' job apathy ($r = 0.372$, $p < 0.001$); There was a positive correlation between job apathy and teacher turnover intention ($r = 0.288$, $p < 0.001$).

The Direct Effect Test

The non-standardized regression coefficient of the effect of work pressure on rural preschool teachers' turnover intention was 0.59 ($p < 0.001$), indicating that the former had a positive influence on the latter.

The non-standardized regression coefficient of the effect of work stress on job apathy was 0.39 ($p < 0.001$), signaling that the former had a positive effect on the latter.

The non-standardized regression coefficient of the effect of job apathy on teacher turnover intention was 0.93 ($p < 0.001$), denoting that the former had a positive effect on the latter.

The Mediating Effect Test

Model fitness $\chi^2/df = 25.989$, GFI = 0.927, AGFI = 0.896, TLI = 0.936, cfi = 0.948, rmsea = 0.081, srmr = 0.049 was basically up to the model fitness index standard, indicating that the mediating effect of job apathy on the relationship between work pressure and rural preschool teachers' turnover intention had a good model fitness.

Besides, work stress positively predicted job apathy ($\beta = 0.39$, $p < 0.001$), which in turn positively predicted teacher turnover intention ($\beta = 0.43$, $p < 0.001$).

The Moderated Mediating Effect Test

The Test of Moderating Effect of Bianzhi Membership

The product term of work stress and Bianzhi membership significantly predicted job apathy and rural preschool teachers' turnover intention (job apathy: $\beta = -0.085$, $t = -3.721$, Boot 95% CI = [−0. 130, −0.040]; turnover intention: $\beta = -0.085$, $t = -2.712$, Boot 95%CI = [−0. 146, −0.024]); The product term of job apathy and Bianzhi membership significantly predicted teacher turnover intention ($\beta = 0.167$, $t = 4.259$, Boot 95% CI = [0.090, 0.244]). Thus, it is concluded that Bianzhi membership can moderate the effects of work stress on teacher turnover intention, work stress on job apathy, and job apathy on teacher turnover intention.

Stratified Analysis of the effects of Bianzhi Membership on Teacher Turnover Intention

As per the data analysis results, there was a significant difference in turnover intention between teachers with Bianzhi membership and those without it ($t = 3.026$, $p < 0.05$), and the turnover intention of the former was considerably higher than that of the latter. Among teachers without Bianzhi membership, the turnover rate of young teachers was relatively higher than that of other age cohorts. Among the young kindergarten teachers

in rural areas, the share of teachers without Bianzhi membership was up to 59.11%, and the majority of them (a total of 77.35%) were working in town and village kindergartens.

There was no significant difference in turnover intention among young teachers with Bianzhi membership working in the county, town and village kindergartens, whereas young teachers without Bianzhi membership working in the town kindergarten had remarkably higher turnover intention than their counterparts working in the county and village kindergartens ($F = 4.866$, $p < 0.05$), which shows that the difference in school location also affects the resignation intention of young preschool teachers.

The principle of "equal pay for equal work" has not been applied to rural kindergarten teachers without Bianzhi membership, who had considerably lower satisfaction in incomes, occupational status, workload, and career development potential than their colleagues with Bianzhi membership. Therefore, they tended to perceive inferiority in social status when comparing themselves to those officially employed teachers ($t = -6.918$, $p < 0.001$).

Conclusions and Suggestions

This study comes to the following conclusions: first, work stress are positively related to job apathy and turnover intention of rural preschool teachers, and job apathy has a significantly positive correlation with their turnover intention; second, job apathy plays a mediating role between work stress and teacher turnover intention; third, the direct correlation of work stress with teacher turnover intention and the mediating effect of job apathy are both moderated by teachers' Bianzhi membership; fourth, the gaps in age as well as salaries and other perks contribute to the difference in turnover intention between teachers with and without Bianzhi membership.

The empirical results confirm that work stress, job apathy, and Bianzhi membership are major factors influencing the turnover intention of rural preschool teachers. In order to lower the turnover rate and ensure the supply of rural preschool teachers, local education departments should carry out an array of reforms including restricting the workload of teachers to a reasonable level, increasing salaries and compensation of teachers, creating a teacher-friendly environment, and allocating adequate Bianzhi memberships to rural kindergartens.

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ARTICLE

An Empirical Study on the Data Analytics-based Self-Regulated Learning Scaffolding Model for Primary Students

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Abstract: *In the age of Internet Plus, the deep integration of information technology into education and individualized instruction have become a growing trend in education development. Self-regulated learning is a key element of student core competence, but easy to be overlooked in basic education. The purpose of this study is to establish the data analytics-based self-regulated learning scaffolding model for primary students and test its results in teaching practice, citing Scaffolding Theory and Zone of Proximal Development Theory as its rationale. Research findings demonstrate that learning data analytics-enabled self-regulated after-class learning can help enhance learning outcomes and develop student learning strategies.*

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Introduction

The integration of big data and artificial intelligence into education and teaching is a driving force for more scientific and goal-oriented development of learning, teaching, and administration. Huge amounts of data have been amassed through expanded application of online learning platforms. Learning data mining, analytics, and modeling allow teachers to precisely grasp student learning situation and to improve instructional efficiency and effectiveness; education administrators can equalize the distribution of educational resources. It has been acknowledged in relevant investigations that self-regulated learning ability is a key component of student core competence and a foundation for further education; and that educational technology can serve as scaffolding that supports student after-class learning. How to deploy educational technology as a measure supporting primary students' after-class learning? To address this question, we attempted to construct a data analytics-based self-regulated learning scaffolding model for primary students and verified its effects on student learning outcomes through experiments.

Research Methodology

This study selected two classes taught by the same teacher in X Primary School in Ningxia Province to conduct a control experiment. One of the classes was randomly chosen as the experimental group and required to use the scaffolding model to carry out self-regulated after-class learning; Learning data were also collected from the control group, but no intervention was imposed on it. The learning analytics system developed by the project team was used as a supporting platform, and an intelligent teaching environment was built in X School to track and evaluate student learning activities in and after class. Researchers used the questionnaire survey to identify the change in student learning attitudes and strategies. The results of the diagnosis and assessment of student cognition were used to compare the learning efficacy of the experimental group and the control group. The measurement tool was designed by three senior mathematics teachers and the pre- and post-tests were conducted at the beginning and end of the experiment respectively.

Research Findings

The Effect of the Scaffolding Model on Learning Outcomes in Student Self-Regulated Study

Comparing the results of the diagnosis and assessment of student cognition before and after the experiment, we discovered that there was a significant gap in the scores between the two groups after the experiment. The average post-test score of the experimental group was 12.5 points (against a total score of 100 points) higher than that of the control group, and the difference reached a significant level ($t = 3.558$, $p < 0.05$). Looking at the score change among students with different pretest results, we found that

scores of medium- and lower-level students increased, whereas those of high-achieving students declined.

The Effect of Scaffolded Self-Regulated Learning on Student Learning Strategies

The learning strategies of students in the experimental group significantly changed after the experiment. Specifically, student cognitive strategies and resource management strategies improved remarkably; the average score of metacognitive strategies rose slightly, but the increase did not reach a significant level.

In addition, this study also ascertained a positive correlation between test score improvement and the level of learning strategies ($r = 0.204$, $p < 0.05$). In other words, students with higher levels of learning strategies could achieve better learning results in scaffolding-based self-regulated study.

The Impact of Student Learning Attitudes and Self-regulated Learning Process on the Outcomes of Scaffolding-Supported Study

The questionnaire was designed to survey student learning attitude improvement in three dimensions: emotion, cognition, and behavior. According to the pretest results, the average score of student learning behavior was relatively low, while those of student learning emotions and cognition were slightly higher. The results of the matched samples t-test indicated that student learning attitudes did not improve significantly after the experiment; and that there were considerable gaps in pretest results among students of low, medium, and high levels of learning attitudes [$F(2, 47) = 3.282$, $p = 0.046$], while the gaps were significantly closed in the posttest [$F(2, 47) = 0.774$, $p = 0.467$], probably due to the fact that in the highly structured scaffolding-based self-regulated learning, student behavior and learning paths are less likely affected by objective attitudes.

Discussions and Conclusions

Scaffolded Self-Regulated Study Based on Data Analytics can Improve Student Learning Results

Examining student performance before and after the experiment, we discovered that the scaffolding model can effectively promote student cognitive development. In self-regulated after-class learning, the proper use of learning analytics system to obtain feedback on learning results and impose timely intervention in the learning process can significantly improve student learning efficiency and boost student cognitive development. Appropriate learning material organization has a positive effect on the outcomes of self-regulated learning, and students should follow the sequence of learning-practice in the self-regulated after-class study.

Scaffolded Self-Regulated Study has a Positive Influence on Student Learning Strategies.

Scaffolded self-regulated study can upgrade student learning strategies because the dashboard of the scaffolding can visualize learning analytics results and present them to students in time. When students are regularly updated on their learning progress and provided with corresponding improvement suggestions, their learning motivation, confidence, and efficacy will be enhanced, which help students clarify their learning goals and modify their learning process.

Individual Characteristics of Students and Learning Paths can affect the Outcomes of Scaffolded Self-Regulated Learning.

The outcomes of scaffolded self-regulated learning vary among students of different original academic levels. This learning model is more effective to students of medium and low academic levels, while high achieving students can adjust their learning strategies by themselves.

In addition, scaffolded self-regulated learning can mitigate the negative impact of learning attitudes on student learning results. In the dashboard-based individualized learning, learning attitudes have no significant influence on learning results, because the system formulates personalized learning paths for students and provides corresponding learning resources, and the scaffolding model helps standardize the processes of self-regulated learning for students.

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NEWSLETTER

Effects of Exercise Intervention on Child Mental Health

By Yan, J., Qian, K. J., Tao, B. L., Zhang, W, J., Zhong, B. B., & Jiang, Y. Y.
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PUBLISHED in *Sports and Science*, this study conducted a 12-week experiment on 169 primary school students, to examine the effects of exercise intervention on child physical self-esteem (Physical self-esteem is an important part of overall self-esteem and the earliest developed component of self-consciousness, involving the individual's views and evaluations on their own appearance, physique, physical ability, etc.), self-concept, and mental health, as well as the mediating role of physical self-esteem and self-concept in the influence of exercise intervention on child mental health. The findings of the study include:

- According to data analysis, exercise intervention has a positive impact on child physical health, self-concept, and mental health. Child physical self-esteem and self-concept are significantly and positively correlated with child mental health, so is child self-concept to child mental health.
- As per mediating effect analysis, total effect of exercise intervention on child mental health is 0.281; the path coefficients of exercise intervention to physical self-esteem, physical self-esteem to mental health, exercise intervention to self-concept, self-concept to mental health, and physical self-esteem to self-concept is 0.149, 0.394, 0.175, 0.517, and 0.280, respectively. All the path coefficients reach the significant level.
- The specific components of mediating path are displayed as follows: (1) indirect path (exercise intervention → physical self-esteem → mental health); (2) indirect path (exercise intervention → self-concept → mental health); (3) indirect path (exercise intervention → physical self-esteem → self-concept → mental health). The effect sizes of the three paths are 0.059, 0.091, and 0.021, accounting for 21%, 32.38%, and 7.47% of the total effect, respectively. The mediating effects of all three paths reach significant levels.

The study drew the following conclusions: (1) Exercise intervention significantly promotes child physical self-esteem, self-concept, and mental health. It imposes a direct effect on child mental health; the longer children exercise, the better their mental health. (2) Exercise intervention affects children's mental health through the mediating role of physical self-esteem and self-concept; that is, the longer the children's physical exercise, the higher the levels of their physical self-esteem and self-concept, which in turn, raise their mental health levels.

Source: Sports & Science, 2022; 43(3):89-96.

NEWSLETTER

The Influence of Grandparenting at the Preschool Stage on Human Capital Accumulation of Junior Secondary Students: An Empirical Analysis Based on the CEPS Data

By Hu, N. Y., & Ning, M. X.
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THE quality of family rearing in the preschool stage plays an important role in the accumulation of individuals' human capital. This study (published in *Studies in Preschool Education*) selected data from the China Education Panel Survey (CEPS) in the 2013-2014 academic year to examine the effects of preschool grandparenting on the cognitive and non-cognitive ability development of junior secondary students using a propensity score matching method.

The findings of the study are as follows:

- Preschool grandparenting considerably promotes cognitive ability of junior secondary students, but significantly inhibited their non-cognitive ability growth.
- In terms of urban-rural heterogeneity, preschool parenting has no significant facilitative effect on cognitive ability of rural junior secondary students, but considerably facilitates cognitive ability development of their urban peers. From the standpoint of family economic status, preschool grandparenting has no significant effect on cognitive and non-cognitive ability of junior secondary students from impoverished families; it has a considerable positive effect on cognitive ability of junior secondary students from non-impoverished families, but a significant inhibitory effect on their non-cognitive ability.

Based on the above findings, the study offers the following policy implications.

First, from the family's perspective, grandparenting in the preschool years may impede individual human capital accumulation in some respects, but the overall positive role of grandparents in the long-term development of their grandparents should not be negated. Parents should recognize their own essential role in their children's development, increase their awareness of companionship, pay attention to communication with their children, and fo-

cus on developing their non-cognitive abilities in life practice. Meantime, grandparents should be encouraged to improve their ability in rearing, update their concepts of education in time, and place a premium on non-cognitive ability development of grandchildren.

Second, the government should invest more in the construction of public care institutions so that official nursery service can play a good complementary role to family care. It should also encourage the development of nonprofit childcare institutions and tap the potential of the nonprofit sector in providing childcare service.

Finally, school education should be given full play in improving human capital accumulation of students from rural areas and poor families, so as to offset the negative effects of preschool grandparenting on junior secondary students. At the same time, the development of non-cognitive skills should be incorporated into the teaching and learning process to boost the comprehensive and lasting competitiveness of junior secondary students in the future labor market.

Source: Studies in Preschool Education, 2022; 2022(5):44-56.

NEWSLETTER

Maternal Occupation Status, Child Educational Attainment and Gender Differences: An Empirical Study Based on the Data from the Chinese General Social Survey

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NOWADAYS, Chinese women have made considerable progress in their career development. How mothers' career advancement affects offspring education and gender differences in child education is an important issue in the research on gender equality in education. Based on CGSS2015 data, this study used regression analysis with instrumental variables to investigate the effects of maternal occupation status on child educational attainment and gender differences. The robustness test was subsequently carried out by re-screening the samples and changing the measurement methods of child educational levels. The heterogeneity effect of maternal occupation status on the gender difference in educational attainment was examined according to distinct family social classes and varying educational levels of parents.

The results of the study:

- Maternal occupation status significantly promotes child education, and the improved maternal occupation status enhances mothers' power in family decision-making, more likely to increase family input in child education.
- Maternal occupation status can significantly and negatively moderate the gender gap in offspring educational attainment; that is, the higher the mother's occupational status, the more equal the educational opportunity of male and female offspring in the family.
- Heterogeneity analysis shows that the impact of maternal occupation status on gender gap in child educational attainment only exists in the family group with relatively higher parental education levels and higher family status, and that the impact is not significant among families from lower social classes and with lower levels of parental education.

To conclude, the advancement of the maternal occupation status in the family has a significant effect on the improvement of the overall educational

level of children and can effectively reduce gender differences in child educational achievements. Therefore, the mother's career advancement is of great significance to family educational reproduction and woman educational opportunity. The improvement of woman labor market status is conducive to the accumulation of offspring educational capital and the reduction of gender inequality in child education. Public policy makers should take this variable into account and formulate pertinent policy measures to support woman career advancement to promote equity in education.

Source: Journal of Shandong University (Philosophy and Social Sciences), 2022; 2022(3):102-114.

NEWSLETTER

Factors Influencing Mathematics Grades of Junior Secondary Students: An Analysis Based on the Hierarchical Linear Model

By Tian, Y., Liu, Z. J., Zhao, M. Z., & Cui, T.
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NOWADAYS, How to improve student classroom learning efficiency has always been an important issue in education. Both students' internal factors and the classroom environment, one of the important external factors, affect their academic performance. This study (published in *Educational Research and Experiment*) surveyed eighth-graders from 10 classes of a middle school in Beijing and adopted the hierarchical linear model to explore the factors influencing math grades of junior secondary students. Student math grades were used as the dependent variable and the student individual academic level and the class average academic level as independent variables. The nested model was employed to examine individual and class factors influencing individual math grades. The findings of the study are as follows.

First, there is no significant gender difference in student math grades, but boys' self-concept and academic self-efficacy in math are remarkably higher than girls'. This may be due to girls' identification with gender stereotypes in math learning.

Second, at the individual level, student self-concept and self-efficacy in math can significantly and positively predict their math scores.

Third, at class level, class cooperation positively predicts student math grades, but class competition has no significant effect on student math scores.

Fourth, class cooperation and student self-concept in math have a significant influence on the cross-layer interaction of their math grades. In the class of low-level cooperation, student self-concept in math can significantly affect student math grades, but in the class of high-level cooperation, the effect is not significant.

According to the above research results, encouraging classroom cooperation is a feasible and effective measure for mathematics learning. In the junior secondary stage, students are experiencing a critical phase of the development and transition of individual self-consciousness, and students acquire higher-order emotional experience and self-acceptance based on self-evaluation. In a good class atmosphere, student self-concept in math is easier

to maintain at a high level. At the same time, as the focus of student self-consciousness is undergoing a transition from physiological needs to inner psychological quality and social communication, the sense of belonging to class is better aligned with students' social psychological needs. Therefore, in junior secondary mathematics teaching, cooperative learning should be encouraged to create a good classroom climate.

Source: Educational Research and Experiment, 2022; 2022(2):107-112.

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