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The effect of teachers' self-efficacy on job satisfaction based on TALIS 2018 data in Shanghai, China

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Tiivistelmä - Referat – Abstract Teachers' job satisfaction is a critical factor influencing the quality and stability of the education system. Previous research has shown that teacher self-efficacy in classroom management, instruction, and student engagement, plays a significant role in influencing teachers' job satisfaction. However, in the context of Shanghai, there is limited empirical evidence on how these dimensions of self-efficacy independently contribute to teachers' job satisfaction. This study examined the relationship between teacher self-efficacy and job satisfaction using data from the Teaching and Learning International Survey (TALIS) 2018. This study used quantitative research methods to conduct multiple regression analysis on the data of Shanghai teachers. Single-variable regression analysis was first conducted, followed by multiple regression to determine the contributions of the three self-efficacy dimensions. To further assess the robustness of these relationships, a hierarchical multiple regression analysis was performed, incorporating demographic factors as control variables. The results showed that teachers' self-efficacy had a significant positive influence on job satisfaction, among which the student engagement dimension emerged as the strongest predictor. It remains significant even after controlling the demographic variables. However, the effects of classroom management and instruction were not statistically significant in the multiple regression analysis, likely due to multicollinearity among the self-efficacy dimensions. Additionally, experienced teachers in Shanghai have lower job satisfaction. Overall, this study provides evidence-based insights about teachers' self-efficacy and teachers' job satisfaction. In future research, longitudinal studies on the relationship between teacher self-efficacy and teachers' job satisfaction can be conducted in different regions with mixed research methods, taking context and era differences into consideration.		
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Teachers' self-efficacy, teachers' job satisfaction, Teaching and Learning International Survey (TALIS)

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<p>Tiivistelmä - Referat - Abstract</p> <p>Opettajien työtyytyväisyys on keskeinen tekijä, joka vaikuttaa koulutusjärjestelmän laatuun ja vakauteen. Aiemmat tutkimukset ovat osoittaneet, että opettajien minäpystyvyys luokan hallinnassa, opetuksessa ja oppilaiden sitouttamisessa vaikuttaa merkittävästi työtyytyväisyyteen. Shanghaiin kontekstissa on kuitenkin vain vähän empiiristä näyttöä siitä, miten nämä minäpystyvyyden ulottuvuudet vaikuttavat itsenäisesti opettajien työtyytyväisyyteen.</p> <p>Tässä tutkimuksessa tarkasteltiin opettajien minäpystyvyyden ja työtyytyväisyyden välistä suhdetta käyttäen aineistoa Opetuksen ja oppimisen kansainvälinen tutkimus TALIS 2018 -kyselystä. Tutkimuksessa käytettiin määrällisiä tutkimusmenetelmiä ja suoritettiin monimuuttujainen regressioanalyysi Shanghaiin opettajien aineistolla. Ensin suoritettiin yksimuuttujainen regressioanalyysi, minkä jälkeen tehtiin monimuuttujaregressio kolmen minäpystyvyyden ulottuvuuden vaikutusten määrittämiseksi. Näiden suhteiden luotettavuuden arvioimiseksi suoritettiin hierarkkinen monimuuttujainen regressioanalyysi, jossa demografiset tekijät sisällytettiin kontrollimuuttujina.</p> <p>Tulokset osoittivat, että opettajien minäpystyvyydellä oli merkittävä positiivinen vaikutus työtyytyväisyyteen, ja ulottuvuus, joka kuvaa minäpystyvyyttä oppilaiden sitouttamisessa nousi vahvimaksi ennustajaksi. Vaikutus pysyi tilastollisesti merkitsevänä myös, kun malliin lisättiin demografisia kontrollimuuttujia. Luokan hallinnan ja opetuksellisten strategioiden minäpystyvyyttä kuvaavien ulottuvuuksien vaikutukset eivät olleet tilastollisesti merkitseviä monimuuttujaisessa regressioanalyysissä, todennäköisesti minäpystyvyyden ulottuvuuksien välisen multikollineaarisuuden vuoksi. Lisäksi kokeneemmilla opettajilla Shanghaissa on alhaisempi työtyytyväisyys.</p> <p>Kaiken kaikkiaan tämä tutkimus tarjoaa näyttöön perustuvia näkemyksiä opettajien minäpystyvyydestä ja työn tyytyväisyydestä. Tulevissa tutkimuksissa voidaan toteuttaa pitkittäistutkimuksia opettajien minäpystyvyyden ja työn tyytyväisyyden välisestä suhteesta eri alueilla, hyödyntäen monimenetelmäistä lähestymistapaa ja ottaen huomioon kontekstuaaliset ja ajalliset erot.</p>		
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1 Introduction

Education is among the key factors in the development of a nation (Oluremi, 2013), and teachers play a central role in educational change (Datnow, 2020) and among the various stakeholders in the education system, as they significantly influence both individual student outcomes and the overall functioning of the system (Darling-Hammond et al., 2020). The quality of education is not only a result of the educational processes, but also of the performance of teachers (Kanya et al., 2021).

To better understand what affects teachers' performance, Bandura (1997) claims that teachers' performance is influenced not only by their professional knowledge and pedagogical skills, but also by psychological attributes such as self-efficacy, since this strongly affects their motivation and overall effectiveness. Teachers' self-efficacy—the belief in one's ability to effectively execute specific teaching tasks (Dellinger et al., 2008)—has been widely studied due to its strong connection to instructional quality, student outcomes, commitment, reduced burnout, and job satisfaction (Caprara et al., 2006; Kasalak & Dagyar, 2020; Chesnut & Burley, 2015; Skaalvik & Skaalvik, 2010).

In addition to self-efficacy, teachers with higher job satisfaction tend to be more motivated and engaged in teaching performance. Both of these contribute to achieving educational goals and promoting student success (Demirtas, 2010). Job satisfaction, though lacking a universally agreed-upon definition, is commonly understood as a positive emotional state derived from one's job experiences (Locke, 1976). It is positively correlated with work performance, mental well-being, teamwork, and employee retention (Pushpakumari, 2008; Faragher & Cooper, 2005; Griffeth et al., 2000). Teachers' job satisfaction plays a vital role in educational effectiveness and systemic stability (Ingersoll, 2001). Several researchers have associated high self-efficacy with greater job satisfaction (Caprara et al., 2006; Klassen & Chiu, 2010).

While extensive research has examined the relationship between teachers' self-efficacy and job satisfaction, most studies have focused on Western educational

contexts, leaving a gap in understanding how they function in non-Western settings. Shanghai, as one of China's most developed educational centers, has a highly competitive and academically demanding teaching environment. In the Programme for International Student Assessment (PISA), Shanghai students ranked first in the world in mathematics, science and reading in 2009 and 2012. The Shanghai municipal government prioritizes education reform and development. In 2021, it introduced the "14th Five-Year Plan for Education Development in Shanghai" to ensure high-quality and balanced education (Shanghai Municipal Government, 2021). Currently, teachers in Shanghai are facing increasing workload and pressure from school administrators, parents and policy makers. A survey by the Shanghai Academy of Educational Sciences revealed that approximately 77.5% of teachers felt their work pressure was "relatively high" (Tang et al., 2009). As noted by Betoret (2006) and Klassen et al. (2009), higher levels of work-related stress are linked with low self-efficacy, more challenges in teaching, and lower job satisfaction. In this context, it is essential to explore how teachers' self-efficacy relates to job satisfaction within Shanghai's unique educational environment.

Furthermore, in the field of teachers' self-efficacy research, based on Bandura's theory, Tschannen-Moran and Hoy (2001) reviewed relevant literature and conducted correlation research to propose a multidimensional model of teachers' self-efficacy. It comprises three distinct but interrelated dimensions: classroom management, instruction, and student engagement, which has been widely employed worldwide. These levels of self-efficacy may have a different degree of influence on teachers' job satisfaction. Understanding the most influential dimension in predicting job satisfaction is important. It helps provide targeted insights for teacher training and professional development programs.

In the study of the relationship between teachers' self-efficacy and job satisfaction, the impact of demographic factors on the association between them has been always considered. The Teaching and Learning International Survey (TALIS) 2018 Concept Framework mentioned that gender and work experience may affect this relationship. To support this view, Klassen and Chiu (2010) also introduced the influence of demographic variables in their article to

examine how teachers' gender and years of work experience interact with job stress to affect self-efficacy and job satisfaction.

Since there are these gaps in the existing literature (e.g., the focus on Western contexts and the tendency to treat self-efficacy as a single concept while ignoring its different dimensions), this study examines the relationship between teachers' self-efficacy and job satisfaction among lower secondary school teachers in Shanghai using data from the TALIS 2018. This study had three aims: Firstly, to explore the overall impact of teachers' self-efficacy on job satisfaction; Secondly, to examine how the three dimensions of teachers' self-efficacy (classroom management, instructional strategies, and student engagement) impact job satisfaction; Thirdly, to determine whether the relationship between teachers' self-efficacy and job satisfaction remains significant when controlling for demographic factors.

The results can provide empirical evidence which indicates recommendations to support teachers and schools by exploring the relationship between teachers' self-efficacy and job satisfaction in a high-pressure, achievement-focused environment like Shanghai.

2 Theoretical background

This chapter begins with an overview of the Teaching and Learning International Survey 2018 (TALIS 2018). It then provides the theoretical background information of teachers' self-efficacy and job satisfaction, and the relationship between them in former studies. In summary, this chapter reviews the relevant findings on these topics, explores the factors that influence them, and discusses their impact on teachers and educational institutions, underscoring their significance in education study.

2.1 TALIS 2018 in Shanghai, China

Teaching and Learning International Survey (TALIS) is an international teaching and learning survey organized by the Organization for Economic Co-operation and Development (OECD) to assess the work environment, teaching practices and professional development of teachers and school leaders worldwide. Since

2008, TALIS has collected information from teachers and principals about working conditions and learning environments in over 60 education systems (OECD, n.d.-a).

TALIS 2018 is the third round of this study. It covers 48 countries and territories and focuses on various topics at teacher level and school level. They are widely used in educational research and policy analysis, providing valuable insights into teachers' working conditions and instructional practices. It has improved the understanding of how different factors influence teaching quality and student outcomes. Additionally, the findings from TALIS 2018 support evidence-based decision-making in education reforms worldwide (OECD, n.d.-b). One of the key findings from TALIS 2018 is the strong link between teachers' self-efficacy and job satisfaction. The higher teachers' confidence in their teaching ability (higher self-efficacy), the greater their job satisfaction (Kasalak & Dagyar, 2020).

In China, the Opinions on Comprehensively Deepening the Reform of Teacher Team Construction in the New Era explicitly set the goal of ensuring that by 2035, teachers experience happiness in their roles, with respect for educators and a strong emphasis on education becoming a societal norm (CPC Central Committee & State Council, 2018). This initiative aims to enable teachers to find joy in their work, gain a sense of achievement in their careers, and feel honored within society, ultimately making the teaching profession one that is widely admired (Fan et al., 2024). Some commentators have noted that this indicates a change in the strategic focus of China's education policy towards teacher development (Li, 2018). A total of 3976 teachers and 198 school principals from 198 lower secondary schools in Shanghai, China, participated in TALIS 2018. The sample schools cover all kinds of lower secondary schools in 16 districts of the city. Therefore, TALIS 2018 data are sufficiently representative of lower secondary school teachers in Shanghai Municipality to be this study's samples to explore the relationship of teachers' self-efficacy in shaping job satisfaction.

2.2 Teachers' self-efficacy

Self-efficacy is the concept created by the researcher, Albert Bandura. It refers to the beliefs of accomplishing the tasks or achieving the aims (Bandura, 1977).

Self-efficacy belief is built through individuals' direct experiences, observational learning from social models, verbal feedback from others, and their emotional readiness levels (Pajares, 2002). A person's self-efficacy is a key factor in shaping their effort, perseverance, ability to develop strategies, and overall performance in training and in the workplace (Heslin & Klehe, 2006). According to Stajkovic and Luthans (1998), self-efficacy was found to have a positive correlation with work-related performance, indicating that individuals with higher self-efficacy tend to perform better in their jobs.

Teachers' self-efficacy has been defined as teachers' 'individual beliefs in their capabilities to perform specific teaching tasks at a specified level of quality in a specified situation' (Dellinger et al., 2008). The quantity of research exploring the theoretical framework, influencing factors, and outcomes of teachers' self-efficacy has increased and received growing attention (OECD, 2018; Klassen et al., 2011). Teachers' self-efficacy is closely related to teaching practice and instructional quality (Holzberger et al., 2013), affecting student achievement and motivation (Caprara et al., 2006). Teachers with high self-efficacy have higher job satisfaction (Kasalak & Dagyar, 2020) and commitment (Chesnut & Burley, 2015), and smaller likelihood of teacher burnout (Skaalvik & Skaalvik, 2010). Studies on teachers' self-efficacy have positive influence on educational system and its reforms and improvements (Ross, 1994; Soodak & Podell, 1993). TALIS 2018 covers the three dimensions of self-efficacy (Tschannen-Moran & Hoy, 2001): self-efficacy in classroom management, in instruction, and in student engagement. Teachers with high self-efficacy are more able to manage the classroom environment, use instructional strategies, and engage students more effectively (Sarfo et al., 2015).

Teachers' self-efficacy in classroom management refers to teachers' judgments of their capability to effectively handle classroom management challenges and disruptions and maintain an orderly environment amid difficulties (OECD 2018; Lazarides et al., 2020). Teachers' self-efficacy in classroom management is seen as a core factor of teachers' professional competence (Kunter & Baumert, 2006). Teachers with high self-efficacy usually show effective classroom management (Woolfolk et al., 1990). This is critical to the physical and mental

health of teachers (Sutton et al., 2009) as well as the academic success of students (Evertson & Weinstein, 2013).

Teachers' self-efficacy in instruction can be regarded as teachers' confidence in using diverse innovative teaching methods and assessment strategies (OECD 2018). Teachers with high self-efficacy are more likely to adopt innovative instructional methods and maintain a proactive, solution-focused approach to pedagogy (Papa, 2015; Stephens, 2015), which impact their instructional practices as well as various related outcomes (Tschannen-Moran et al., 1998). At the same time, an increase in the quality of instruction enhances teachers' self-efficacy (Holzberger et al., 2013).

Teachers' self-efficacy in student engagement means teachers' confidence about the emotional and cognitive support they can provide their students and their ability to encourage students' learning autonomy (OECD, 2018; Woolfolk et al., 1990). Teachers with high self-efficacy positively influence their attitudes toward students, enhancing student engagement (Van Uden et al., 2013). Additionally, they demonstrate greater persistence and effort, which further motivates students to actively engage in learning (Sarfo et al., 2015). Student engagement plays an important role in increasing their learning outcomes (Carver et al., 2021). Student engagement is related to their higher achievement, continual development, and academic success (Wang et al. 2011).

2.3 Teachers' job satisfaction

There is no universally agreed-upon definition of job satisfaction (Demirtas, 2010). One widely accepted definition, proposed by Locke (1976), describes job satisfaction as "a pleasurable or positive emotional state resulting from the appraisal of one's job or job experiences." This definition is among the most frequently cited and is generally regarded as a key framework for understanding the broad concept of job satisfaction (Miller et al., 2009). There is a significant positive association between job satisfaction and employees' performance (Pushpakumari, 2008). Additionally, positive job satisfaction reduces employee turnover (Griffeth et al., 2000), enhances mental well-being (Faragher &

Cooper, 2005), and encourages teamwork (Robbins & Judge, 2013).

Satisfaction with job contributes to the development of the factors required to create a healthy society (Kasalak, & Dagyar, 2020). Therefore, the study of job satisfaction has important implications for individuals, teams and even society.

Teachers' job satisfaction is derived from the broader concept of job satisfaction and has been developed through extensive research in the field (Liu & Niu, 2023). Teachers' job satisfaction is a significant and noteworthy topic (Guoba et al., 2022; Toropova et al., 2020). Teachers with higher job satisfaction are more motivated to engage in teaching, leading to achieve educational goals and contribute to the successful training of students (Demirtas, 2010). Teachers' job dissatisfaction increases teachers' turnover and destroys the stability of the education system (Ingersoll, 2001). Teachers' job satisfaction is associated with the phenomenon of teacher burnout and teacher mental health problems (Skaalvik & Skaalvik, 2011), it also affects professional commitment and engagement (Bogler, 2001). Furthermore, teachers' job satisfaction is also linked to the teachers' perceptions of school climate (Collie et al., 2012). Therefore, studying teachers' job satisfaction is crucial since it directly influences teaching quality, teacher retention, teachers' mental well-being, and overall school development.

According to the TALIS 2018 design, teachers' job satisfaction contains two dimensions: satisfaction with work environment (in their schools) and satisfaction with the profession. The TALIS results demonstrate that several factors which affect teachers' job satisfaction. Positive factors include teachers' self-efficacy, participation in school decision-making, effective performance evaluation and feedback, and a favorable environment for teacher collaboration. Negative factors included classroom discipline problems, formalistic administrative assessments, and heavy workloads.

2.4 The connection between the teachers' self-efficacy and job satisfaction.

The connection between teachers' self-efficacy and job satisfaction is crucial (Gkolia et al., 2014). Teachers who perceive themselves as competent in their

profession tend to develop strong self-efficacy beliefs, which can positively influence their job satisfaction (Kasalak & Dagyar, 2020). Teachers are more likely to feel dissatisfied with their work if they believe they cannot handle challenges (Moè & Ronconi, 2010). The positive relationship between teachers' self-efficacy and job satisfaction has been widely recognized in the relevant literature. (Kasalak & Dagyar, 2020; Klassen & Chiu, 2010; Soto & Rojas, 2019; Biçer,2023; Akomolafe & Ogunmakin, 2014).

Sulla and Rollo (2023) investigated the effects of a brief training program on praise frequency and on-task behavior among Italian primary school teachers, finding a positive association between teachers' self-efficacy and job satisfaction, where higher self-efficacy levels were associated with greater satisfaction within the teaching profession. The research findings by Demir (2020) in Turkey mentioned that as teachers' self-efficacy beliefs grew, their job satisfaction, organizational commitment, motivation, and job involvement also increased. Through the full mediation of job satisfaction and motivation, self-efficacy beliefs had a positive impact on teachers' job involvement (Demir, 2020). Burić and Macuka (2018) conducted a study with Croatian teachers, revealing that those with greater self-efficacy reported higher job engagement, increased satisfaction, enthusiasm, and enjoyment, while experiencing lower levels of exhaustion, frustration, and anger toward students. Teachers with higher self-efficacy and job satisfaction are better equipped to maintain a positive work attitude, thereby reducing the risk of burnout (Li, Y., 2024). A large-scale study carried out in five countries—Canada, Cyprus, Korea, Singapore, and the USA—examined the relationship between teachers' self-efficacy and job satisfaction. The findings revealed a positive correlation between these two variables across all five countries (Klassen et al., 2009). Moreover, researchers found the same conclusion that teachers with high self-efficacy in terms of classroom management and instructional strategies reported high job satisfaction as well (Klassen & Chiu, 2010; Canrinus et al., 2012). Türkoğlu's (2017) and Göldağ's (2020) studies concluded that teachers' self-efficacy in student engagement has an impact on teacher satisfaction.

The above studies suggest that it is significant to study the relationship between teachers' self-efficacy and job satisfaction, which is helpful for researchers to improve teachers' job satisfaction, thereby improving the quality of education.

However, some studies suggest that self-efficacy does not significantly impact job satisfaction (Islam et al., 2018; Reilly et al., 2014), revealing the complexity of this relationship. Given the multifaceted nature of educational research, a single independent study cannot provide conclusive results (Kasalak & Dagyar, 2020). Therefore, examining these factors with various methods in different places is essential for a more comprehensive understanding of their interactions. In addition, understanding the factors influencing teachers' self-efficacy and job satisfaction requires consideration of teacher background information, like gender, employment status, and work experience (OECD, 2018).

3 Research aims and questions

This study examined the relationship between teachers' self-efficacy and job satisfaction among teachers in Shanghai, using data from the Teaching and Learning International Survey (TALIS) 2018. Specifically, this study explored how different dimensions of teachers' self-efficacy—classroom management, instruction, and student engagement—independently contribute to job satisfaction. Additionally, this study sought to identify which dimension serves as the strongest predictor of job satisfaction. To ensure a robust analysis, this study investigated whether these relationships remain significant after controlling demographic variables gender and work experience.

Questions:

1. What is the relationship between overall teachers' self-efficacy and job satisfaction among teachers in Shanghai?
 - 1.1 Is there a significant positive association between overall teachers' self-efficacy and job satisfaction among Shanghai teachers? What is the direction and strength of this relationship?
 - 1.2 Does this relationship remain significant when controlling gender and work experience?

These questions were designed to investigate whether higher teachers' self-efficacy is linked to greater job satisfaction among Shanghai teachers, as well as the direction and strength of this relationship. They were also used to examine whether this association remains significant after considering demographic factors, evaluating the robustness of self-efficacy as a predictor of job satisfaction.

2. How do different dimensions of teachers' self-efficacy influence job satisfaction?
 - 2.1 How do the three dimensions of teachers' self-efficacy (classroom management, instruction, and student engagement) influence teachers'

job satisfaction? Which dimension of teachers' self-efficacy has the strongest predictive power for job satisfaction?

2.2 Do these effects remain significant when controlling gender and work experience?

These questions were designed to investigate the extent to which each dimension of teachers' self-efficacy contributes to job satisfaction within a multiple regression framework, identifying their independent effects. They were also used to compare the predictive strength of the three dimensions by analyzing standardized regression coefficients (Beta), determining the most influential factor in explaining job satisfaction. Furthermore, they aimed to examine whether these effects remain significant when demographic factors (gender and work experience) are included as control variables.

4 Methodology (research work)

4.1 Research approach

Based on data from TALIS 2018, this study employed a quantitative research approach, utilizing regression-based statistical modeling to explore the relationship between teachers' self-efficacy and job satisfaction among teachers in Shanghai. Since the structured and large-scale feature of the dataset, this approach allowed for a systematic and strict investigation of the research questions.

A correlational and explanatory research design was adopted to analyze both the overall relationship between teachers' self-efficacy and job satisfaction and the distinct contributions of its three sub-dimensions—classroom management, instructional strategies, and student engagement. To provide a comprehensive analysis, multiple regression analysis was used to examine the extent to which each self-efficacy dimension is associated with job satisfaction. Additionally, hierarchical multiple regression analysis was conducted to determine whether the relationship between teachers' self-efficacy and job satisfaction remains significant when controlling for demographic variables gender and work experience. Multiple linear regression was extensively employed for analyzing relationships between variables and predicting educational outcomes (Cohen, et al., 2013; Keith, 2019; Tabachnick & Fidell, 2019).

This study employed the IEA IDB Analyzer and SPSS as the analytical tools to ensure the accuracy and robustness of statistical analysis. The IEA IDB Analyzer is specifically designed for handling large-scale international datasets like TALIS to account for complex survey designs (IEA, n.d.). IDB Analyzer uses a graphical interface to automatically read data content and generate SPSS syntax, allowing users to perform data analysis without manually writing complex code. The generated SPSS syntax file (.sps) can be directly executed in SPSS, producing data files (.sav) and analysis results (.spv or Excel, CSV format). Combining both tools significantly enhances the efficiency, accuracy, and consistency of large-scale international data analysis (IEA, 2022).

4.2 Data sources

This study specifically focused on lower secondary school, as International Standard Classification of Education (ISCED) Level 2 teachers, in Shanghai, China, utilizing the TALIS 2018 data conducted by the OECD. The following narrative is drawn primarily from the TALIS 2018 Technical Report (2019). TALIS used systematic random sampling with probability proportional to size (PPS). Schools were first grouped into explicit strata based on national sampling plans and then sorted by measure of size (MOS) in a serpentine manner, which maintained balance across school sizes and facilitate better variance estimation in sampling error calculations. Schools in Shanghai were stratified based on two locations and two types of funding to ensure sample representativeness across different educational contexts. The systematic sampling process involved sorting schools by MOS (number of teachers), computing a sampling step (k) based on the total MOS and the number of schools to be sampled, and selecting schools at regular intervals after determining a random starting point (d). Each selected school was assigned two replacement schools to account for potential non-response, ensuring sample integrity.

Within each sampled school, 20 teachers were randomly selected using the systematic random sampling method. If a school had fewer than 20 teachers, all teachers were included in the sample. Each participating country/economy was provided with the International Association for the Windows Within-School Sampling Software (WinW3S) by the International Association for the Evaluation of Educational Achievement (IEA) Hamburg to help create the sampling frames and sample selection of teachers and to ensure compliance with the sample design and with furnishing complete documentation.

The data was collected through self-administered questionnaires, which were guided by the TALIS Conceptual Framework and validated through strict psychometric testing to ensure reliability. The data collection in Shanghai took place between March and May 2018. Shanghai adopted the Online Survey Mode in strict accordance with Technical Standards, 3976 teachers from 198 lower secondary schools in Shanghai completed the questionnaire online.

Shanghai maintained a 100% school participation rate and a 99.5% teacher participation rate, demonstrating the high quality and effective implementation of the survey. To guarantee the compliance with TALIS 2018 Technical Standards, International Quality Observers (IQOs) and National Quality Observers (NQOs) supervised the data collection process.

After data collection, the IEA Data Management Expert (DME) system processed and cleaned the data to verify responses, ensure consistency, and address missing data. TALIS 2018 applied sampling weights to correct potential biases and enhance the dataset's representativeness. The final dataset is accessible through the OECD website, allowing researchers to conduct further analyses. The data quality of Shanghai was rated by TALIS 2018 as "Good."

4.3 Variables

The key variables of this study are structured as follows:

The dependent variable in this study is job satisfaction (T3JOBSA). It is a composite variable derived from two subscales: job satisfaction with work environment (T3JSENV) and job satisfaction with the profession (T3JSPRO). Teachers responded to statements about their job satisfaction using a four-point Likert scale: 1 = Strongly disagree, 2 = Disagree, 3 = Agree, 4 = Strongly agree. Each subscale includes specific items measuring different aspects of job satisfaction. Items marked with a star (*) are reverse-coded items.

Table 1 Item wording for teachers' job satisfaction from TALIS 2018

T3JOBSA: Job satisfaction, composite	
T3JSENV: Job satisfaction with work environment (subscale)	
TT3G53: We would like to know how you generally feel about your job. How strongly do you agree or disagree with the following statements?	
Response options: "Strongly disagree"(1), "Disagree" (2), "Agree" (3), "Strongly agree" (4).	
TT3G53C*	I would like to change to another school if that were possible
TT3G53E	I enjoy working at this school
TT3G53G	I would recommend this school as a good place to work

TT3G53J	All in all, I am satisfied with my job
T3JSPRO: Job satisfaction with profession (subscale)	
TT3G53: We would like to know how you generally feel about your job. How strongly do you agree or disagree with the following statements?	
Response options: "Strongly disagree"(1), "Disagree" (2), "Agree" (3), "Strongly agree" (4).	
TT3G53A	The advantages of being a teacher clearly outweigh the disadvantages
TT3G53B	If I could decide again, I would still choose to work as a teacher
TT3G53D*	I regret that I decided to become a teacher
TT3G53F*	I wonder whether it would have been better to choose another profession

In TALIS 2018, composite variables (scale scores) were computed using Confirmatory Factor Analysis (CFA) to account for varying relationships between observed items and latent constructs. Scores were standardized so that the midpoint corresponded to 10, ensuring cross-country comparability. Composite scores for multidimensional constructs (e.g., job satisfaction) were calculated as the average of standardized subscale scores. Measurement invariance testing ensured validity across countries and ISCED levels. The Maximum Likelihood Robust (MLR) and Weighted Least Squares Mean and Variance Adjusted (WLSMV) methods were used for estimation, making the scale scores reliable, interpretable, and comparable globally. For detailed methodology, see TALIS 2018 Technical Report, pages 208-213.

The primary independent variable is overall teachers' self-efficacy (T3SELF). This composite variable is derived from three subscales: self-efficacy in classroom management (T3SECLS), self-efficacy in instruction (T3SEINS), and self-efficacy in student engagement (T3SEENG). Teachers responded to statements regarding their self-efficacy using a four-point Likert scale: 1 = Not at all, 2 = To some extent, 3 = Quite a bit, 4 = A lot. Each subscale consists of specific items measuring different aspects of self-efficacy.

Table 2 Item wording for teachers' self-efficacy from TALIS 2018

T3SELF: Teachers' self-efficacy, composite	
T3SECLS: Self-efficacy in classroom management (subscale)	
TT3G34: In your teaching, to what extent can you do the following?	
Response options: "Not at all" (1), "To some extent" (2), "Quite a bit" (3), "A lot" (4).	
TT2G34D	Control disruptive behaviour in the classroom
TT2G34F	Make my expectations about student behaviour clear
TT2G34H	Get students to follow classroom rules
TT2G34I	Calm a student who is disruptive or noisy
T3SEINS: Self-efficacy in instruction (subscale)	
TT3G34: In your teaching, to what extent can you do the following?	
Response options: "Not at all" (1), "To some extent" (2), "Quite a bit" (3), "A lot" (4).	
TT2G34C	Craft good questions for students
TT2G34J	Use a variety of assessment strategies
TT2G34K	Provide an alternative explanation, for example when students are confused
TT2G34L	Vary instructional strategies in my classroom
T3SEENG: Self-efficacy in student engagement (subscale)	
TT3G34: In your teaching, to what extent can you do the following?	
Response options: "Not at all" (1), "To some extent" (2), "Quite a bit" (3), "A lot" (4).	
TT2G34A	Get students to believe they can do well in schoolwork
TT2G34B	Help students value learning
TT2G34E	Motivate students who show interest in schoolwork
TT2G34G	Help students think critically

The composite teachers' self-efficacy score (T3SELF) was calculated in the same way as other composite variables.

To ensure the robustness of the analysis, several control variables were included. Gender (TT3G01) is considered, with the following coding: 1 = Female, 2 = Male. Furthermore, total years of teaching experience (TT3G11B) was controlled as a continuous variable. Rather than categorizing it into discrete groups, the variable is included in its original numeric form to retain the full range of variation in teachers' experience.

One important consideration is that while the OECD regards employment status as a key component of teacher background information and TALIS 2018 included as a control variable in some regression analyses, its relevance in Shanghai, China, was minimal. Given that the vast majority of teachers in Shanghai are full-time employees, variations in employment status are negligible. As a result, it was not included as a control variable in this study.

4.4 Research validity

Sampling Validity

This study used a representative sample from the TALIS dataset, which enhanced the generalizability of the findings for the Shanghai area. Unlike small-scale studies that may suffer from sampling bias, this study provided insights that are applicable to a broader population of teachers. It also reinforced both external validity and policy relevance.

Questionnaire Design Validity

The national survey instruments (the localized versions of the questionnaires) for TALIS 2018 were translated from research priorities and goals by the Questionnaire Expert Group (QEG) and they also designed an analysis plan. The instruments development process took place in three phases between 2015 and 2017: through a pilot study using focus groups, a quantitative field trial, and psychometric analyses before the main survey. A series of embedded experiments were conducted in the field trial phase using different but overlapping versions of the teacher questionnaire. On this basis, each country

translated and adapted the language to its own situation, which includes three verification steps: national adaptation verification, translation verification, and layout verification. Therefore, this questionnaire could be regarded reliable and had internationally comparable insight.

Data Collection Validity

The data collection process for TALIS 2018 followed strict international quality assurance standards to guarantee consistency and reliability across different countries. Quality assurance was maintained through: 1. International Data Collection Quality Observation (IQO): Managed by IEA Amsterdam, this program documented and monitored survey preparation and implementation across all participating countries. 2. National Data Collection Quality Observation (NQO): Each country's National Study Centre (NSC) was responsible for implementing standardized protocols to maintain data integrity. 3. Survey Activities Questionnaire (SAQ): After the main survey, National Project Managers (NPMs) in each country completed this questionnaire to provide feedback on survey implementation to ensure transparency and procedural adherence in data collection procedures. These measures reduced potential bias and standardized data collection. As a result, the findings became more reliable and easier to compare across different countries and regions.

Research Design Validity

Multiple regression analysis was used in this study to examine how the three dimensions of teachers' self-efficacy—classroom management, instruction, and student engagement—affected job satisfaction. This approach accounted for the relationships among these dimensions, making the findings more valid. By comparing the standardized regression coefficients, this study identified the most influential dimensions in the model, thereby providing more precise and robust estimates of the contribution of each variable.

Hierarchical regression further enhanced the validity and reliability of the analysis by systematically introducing demographic control variables gender and work experience. Including these controls helped isolate the effect of teachers' self-efficacy on job satisfaction, ensuring that observed relationships

were not confounded by demographic differences. This stepwise approach refined the assessment of self-efficacy's impact on teachers' professional well-being, reinforcing the study's robustness, credibility, and causal inference.

This research was carefully structured to enhance both internal validity (the extent to which causal relationships can be inferred) and external validity (the generalizability of findings). By implementing these methodological safeguards, the study ensures that the findings are credible, statistically sound, and meaningful in understanding the role of teachers' self-efficacy in job satisfaction.

4.5 Ethical consideration

I completed the mandatory research ethics training provided by the University of Helsinki. Accordingly, ethics principles were taken into account in every stage of this study. All data was TALIS 2018 public data from the official OECD website, which was designed for educational research globally. The data collection process strictly adhered to the TALIS 2018 requirements for research ethics, and all participants signed a series of informed consent forms and data protection agreements, and answered the questionnaires anonymously (OECD, 2019).

As the data was anonymized, there was no disclosure or invasion of participants' privacy during the data processing. The data was utilized for academic purposes only with secure data analysis and processing software (IDB Analyzer and SPSS), and thesis was written in accordance with relevant laws, regulations and the University of Helsinki's ethical guideline, thereby ensuring the transparency, integrity, and proper data management.

4.6 Data analysis

To ensure data integrity, missing values were handled using Listwise Deletion (IDB analyzer automatically chose), removing cases with missing data. Descriptive statistics were computed to summarize the key variables, including mean, standard deviation (SD), minimum, and maximum.

Additionally, linear regression analysis was conducted to evaluate the impact of teachers' self-efficacy on job satisfaction. The key regression metrics calculated

included the unstandardized regression coefficient B (showing how much job satisfaction increases for each one-unit increase in teachers' self-efficacy) , standardized coefficient Beta (indicating the relative strength of teachers' self-efficacy in predicting job satisfaction compared to other variables), t-value (testing whether the effect of teachers' self-efficacy is statistically significant; larger t-values suggest stronger evidence against the null hypothesis), and coefficient of determination R² (reflecting how much of the variance in job satisfaction can be explained by teachers' self-efficacy).

A significance test (p-value) was also performed to determine whether the independent variable had a statistically significant effect on the dependent variable, with p < 0.05 considered statistically significant.

Regression Models

Different regression models were employed based on the research questions.

RQ1.1 Single-variable regression model:

$$Y = \beta_0 + \beta_1X + \epsilon$$

Y is the dependent variable (teachers' job satisfaction, T3JOBSA), X is the independent variable (overall teachers' self-efficacy, T3SELF), β_0 is the intercept, β_1 is the regression coefficient, ϵ is the error term.

RQ1.2 Hierarchical multiple regression model:

The model was constructed in steps. Model 1 is the same as RQ1.1. Model 2 added demographic control variables (gender and work experience):

$$Y = \beta_0 + \beta_1X + \beta_2C + \epsilon$$

C represents the set of control variables.

RQ2.1 multiple regression analysis model:

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \epsilon$$

X_1 represents classroom management self-efficacy, X_2 represents instructional self-efficacy, X_3 represents student engagement self-efficacy.

RQ2.2 Hierarchical multiple regression model:

The model was also constructed in steps. Model 1 is the same as RQ2.1. Model 2 added demographic control variables (gender and work experience):

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4C_4 + \epsilon$$

With the help of IDB analyzer, the statistical analyses were conducted using the Balanced Repeated Replication (BRR) method, with teacher weights (TCHWGT) applied as the survey weight to ensure accurate estimation of standard errors automatically. The results of these analyses are presented below.

5 Research results

5.1 Descriptive results

The descriptive results indicate that the mean teachers' job satisfaction score (T3JOBSA) was 12.08 (SD = 1.85), suggesting that, on average, teachers report a moderate level of job satisfaction, and a little bit higher than TALIS 2018 average level of 10. The mean teachers' self-efficacy score (T3SELF) was slightly higher at 12.68 (SD = 2.70), with individual scores spanning from 1.25 to 16.12, indicating a relatively broad distribution of perceived self-efficacy among teachers.

Among the three subdimensions of self-efficacy, classroom management self-efficacy (T3SECLS) had a mean of 12.64 (SD = 2.37), and Instructional self-efficacy (T3SEINS) had a similar mean of 12.59 (SD = 2.51). This suggests that teachers generally felt confident in their ability to manage classrooms and instructional strategies. Lastly, student engagement self-efficacy (T3SEENG) had a mean of 11.93 (SD = 2.60), the lowest among the three subdimensions. This suggests that teachers may perceive engaging students as slightly more challenging compared to managing classrooms and delivering instruction.

Table 3 Descriptive statistics

Variables	Mean	SD	Min	Max
Teachers' Job Satisfaction (T3JOBSA)	12.08	1.85	5.17	16.14
Teachers' Self-Efficacy (T3SELF)	12.68	2.70	1.25	16.12
Self-Efficacy in Classroom Management (T3SECLS)	12.64	2.37	2.86	14.97
Self-Efficacy in Instruction (T3SEINS)	12.59	2.51	2.51	15.67
Self-Efficacy in Student Engagement (T3SEENG)	11.93	2.60	2.68	15.26

5.2 Overall teachers' self-efficacy effect on job satisfaction

5.2.1 Association between overall teachers' self-efficacy and job satisfaction

The single-variable regression results indicated that overall teachers' self-efficacy (T3SELF) had a significant positive effect on job satisfaction (T3JOBSA). Teachers' self-efficacy exerted a moderate positive influence ($B=0.1705$, $Beta = 0.2489$). The t value ($t = 12.2083$, $p < 0.001$) indicates that the effect is highly statistically significant. These findings suggest that higher teachers' self-efficacy is associated with greater job satisfaction.

Table 4 Model 1.1 Overall teachers' self-efficacy effect on job satisfaction

Variables	B	Beta	t	p-value
Teachers' Self-Efficacy(T3SELF)	0.1705	0.2489	12.2083	$p < 0.001$ Significant

The model's coefficient of determination R^2 explained 6.2% of the variance in job satisfaction ($R^2 = 0.0619$). This indicates that while overall teachers' self-efficacy has a significant effect on job satisfaction, it can explain only a relatively small share of the variation in job satisfaction, and that there are other factors affecting teacher satisfaction.

5.2.2 Controlling for demographic variables

To evaluate whether teachers' self-efficacy remains a significant predictor of job satisfaction after controlling for demographic factors, a hierarchical multiple regression analysis was conducted.

Table 5 Model 1.2 Overall teachers' self-efficacy effect on job satisfaction with control variables

Variables	B	Beta	t	p-value
Teachers' Self-Efficacy (T3SELF)	0.1825	0.2662	12.8298	$p < 0.001$ Significant
Gender (TT3G01)	0.0100	0.0024	0.1422	$p > 0.05$ Not Significant
Work experience (TT3G11B)	-0.0276	-0.1432	-8.9625	$p < 0.001$ Significant

When demographic factors, Gender (TT3G01) and Work experience (TT3G11B) were added in Model 1.2, the explained variance increased to 8.2% ($R^2 = 0.0819$, $\Delta R^2 = 0.02$), indicating an improvement in the model's explanatory power after controlling for these variables. Nonetheless, overall teachers' self-efficacy remains an important predictor of job satisfaction, and the standardized regression coefficient Beta for it increases a little bit even when demographic factors are controlled. In this model, Gender (TT3G01) did not have a significant effect, but work experience (TT3G11B) showed a significant effect.

Table 6 Hierarchical Regression Results: Model 1.1 and Model 1.2

Model	R ²	ΔR ²	Significant Predictors
Model 1.1 (T3SELF only)	0.0619	-	T3SELF: Beta = 0.2489, t = 12.2083, p < 0.001
Model 1.2 (Adding demographic factors)	0.0819	0.0200	T3SELF: Beta = 0.2662, t = 12.8298, p < 0.001 Work experience (TT3G11B): Beta = -0.1432, t = -8.9625, p < 0.001

5.3 The sub-dimensions effect on job satisfaction

5.3.1 The three dimensions of teachers' self-efficacy influence on job satisfaction

To further investigate the contributions of different aspects of teachers' self-efficacy, a multiple linear regression was conducted. The overall model explained 6.8% of the variance in job satisfaction ($R^2 = 0.0680$). The results revealed that only student engagement self-efficacy had a significant positive relationship with job satisfaction ($p < 0.001$), whereas classroom management and instructional self-efficacy were not significant predictors.

Table 7 Model 2.1 Multiple Regression Analysis Results: Three subdimensions

Variables	B	Beta	t	p-value
Classroom Management (T3SECLS)	0.0032	0.0041	0.13	>0.05 (Not Significant)
Instruction (T3SEINS)	0.0314	0.0426	1.28	>0.05 (Not Significant)
Student Engagement (T3SEENG)	0.1584	0.2221	6.91	<0.001 (Significant)

However, in multiple regression analysis, when variables are highly correlated, one predictor may dominate while others seem weaker than they actually are. Therefore, their correlation should be tested.

Table 8 Pearson correlation among three dimensions

Variables	T3SECLS	T3SEINS	T3SEENG
Classroom Management (T3SECLS)	1.00	-	-
Instruction (T3SEINS)	0.77***	1.00	-
Student Engagement (T3SEENG)	0.74***	0.80***	1.00

Note. *** $p < 0.001$, which means statistically significant.

The strong correlation among the three variables suggests the presence of multicollinearity, which may cause student engagement to appear as the most significant predictor while diminishing the apparent effects of the other two variables.

To demonstrate the impact of multicollinearity, regression analyses were conducted individually for each dimension to examine their individual effects on job satisfaction.

Table 9 Teachers' self-efficacy in classroom management single-variable regression result

Variables	R ²	B	Beta	t	p-value
Classroom Management (T3SECLS)	0.0405	0.1575	0.2013	10.2670	<0.001 (Significant)

Table 10 Teachers' self-efficacy in instruction single-variable regression result

Variables	R ²	B	Beta	t	p-value
Instruction (T3SEINS)	0.0503	0.1652	0.2243	10.6882	<0.001 (Significant)

Table 11 Teachers' self-efficacy in student engagement single-variable regression result

Variables	R ²	B	Beta	t	p-value
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Student Engagement (T3SEENG)	0.0671	0.1848	0.2591	13.1899	<0.001 (Significant)
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Therefore, the results of Model 2.1 do not mean the other variables are irrelevant or insignificant.

5.3.2 Controlling for demographic variables

To evaluate whether the three dimensions of teachers' self-efficacy remain significant predictors of job satisfaction after controlling for demographic factors, a hierarchical multiple regression analysis was conducted.

Table 12 Model 2.2 Three dimensions effect on job satisfaction with control variables

Variables	B	Beta	t	p-value
Classroom Management (T3SECLS)	0.0075	0.0096	0.3099	>0.05 (Not Significant)
Instruction (T3SEINS)	0.0222	0.0302	0.9083	>0.05 (Not Significant)
Student Engagement (T3SEENG)	0.1773	0.2482	7.7027	<0.001 (Significant)
Gender (TT3G01)	-0.0136	-0.0032	-0.1938	>0.05 (Not Significant)
Work experience (TT3G11B)	-0.0285	-0.1482	-9.2342	<0.001 (Significant)

Considering the impact of multicollinearity, in addition to the three dimensions of teachers' self-efficacy having a significant effect on job satisfaction, teachers' work experience also negatively reflects job satisfaction to a certain extent (Beta = -0.0285, $p < 0.001$), which means that more experienced teachers have lower job satisfaction.

When demographic factors, Gender (TT3G01) and Work experience (TT3G11B) were added in Model 2.2, the explained variance increased to 8.95% ($R^2 = 0.0895$, $\Delta R^2 = 0.0215$), indicating an improvement in the model's explanatory power after controlling for the variables.

Table 13 Hierarchical Regression Results: Model 2.1 and Model 2.2

Model	R^2	ΔR^2
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Model 2.1 (Three dimensions)	0.0680	-
Model 2.2 (Adding demographic factors)	0.0895	0.215

6 Discussion

6.1 Teachers' self-efficacy plays a significant role in predicting job satisfaction

This study provides empirical evidence that teachers' self-efficacy plays a significant role in predicting job satisfaction. The findings from the single-variable regression analysis (RQ1) confirm that overall teachers' self-efficacy has a moderate positive effect on job satisfaction, aligning with previous research. In this model, teachers' self-efficacy explained 6.2% of the variance in job satisfaction, which is close to the results of Biçer's survey ($R^2 = 5.5\%$) on teachers' self-efficacy and job satisfaction for teachers who teach Turkish as a foreign language (Biçer, 2023). Additionally, hierarchical regression analysis shows that even after controlling for demographic variables (gender and work experience), teachers' self-efficacy remains a predictor of job satisfaction ($R^2 = 0.82$). Social phenomena are influenced by numerous interacting factors, making it difficult for a single model to fully capture all relevant relationships. A low R^2 suggests limited explanatory power, but it does not diminish the significance of statistically meaningful relationships identified in the model (Gelman & Hill, 2007; Wooldridge, 2019).

Research by Akomolafe and Ogunmakin (2014) also revealed a significant relationship between self-efficacy and job satisfaction. As the authors explained, first, self-efficacy determines how a person behaves, thinks, and becomes motivated to get involved in specific tasks. Therefore, people with high self-efficacy have a tendency to behave more actively and think more creatively, which also interacts with motivation (Gkolia et al., 2014). Such teachers tend to report higher levels of job satisfaction. Secondly, people with high self-efficacy

have the ability to more effectively handle the different tasks, obligations, and challenges associated with their professional roles (Gkolia et al., 2014).

6.2 Teachers' self-efficacy in student engagement plays a significant role in job satisfaction.

A deeper analysis into the three dimensions of teachers' self-efficacy reveals that their contributions to job satisfaction are not equal. The multiple regression results (Model 2) show that teachers' self-efficacy in student engagement is the strongest predictor of job satisfaction. This suggests that in Shanghai, teachers who believe they can motivate and involve students in the learning process are more likely to experience a sense of fulfillment from their profession. This kind of satisfaction may come from the positive feedback and interaction that they get from the students, which may reinforce the goal of their teaching and success.

However, this result is not entirely consistent with previous research. For example, Klassen and Chiu (2010), studying secondary school teachers in Canada, found that only classroom management and instruction self-efficacy predicted job satisfaction. They suggested that student engagement self-efficacy had no effect probably because teachers often perceive student engagement as influenced by external factors, and thus less within their personal control. Moreover, Göldağ (2020) found that all three dimensions of self-efficacy were moderately and significantly positively related to job satisfaction in his study of high school teachers. In his study, teachers' self-efficacy in student engagement had the strongest impact on their job satisfaction, followed by the instruction and classroom management self-efficacy. Similarly, Türkoğlu (2017) found that self-efficacy for student engagement was the only consistent predictor of multiple dimensions of job satisfaction, including job quality, development and promotion opportunities, working conditions, interpersonal relationships, and organizational environment. His findings also indicated that both student engagement and classroom management self-efficacy predicted teachers' job satisfaction with development and promotion opportunities. These findings show that teachers who feel

confident in engaging students and managing classrooms effectively are more likely to see better career advancement opportunities and experience higher job satisfaction. The different results across studies may be because of the differences in cultural contexts (e.g., North America, the Middle East, and Asia). This also emphasizes the complexity of teachers' self-efficacy sub-dimensions relationship with their job satisfaction.

When teachers think that their efforts in student engagement successfully inspire students to participate actively in learning, demonstrate curiosity, and show academic progress, they are more likely to experience a sense of accomplishment and professional satisfaction. This matches with Bandura's opinions, which emphasize the role of self-efficacy in influencing behavior, motivation, and perseverance. Bandura (1997) states that individuals with higher self-efficacy tend to set challenging goals, persist through difficulties, and feel more satisfied with their achievements. In the context of education, teachers with strong self-efficacy in student engagement are more resilient, proactive, and effective in promoting an interactive and motivating learning environment, reinforcing a cycle of positive reinforcement and professional fulfillment.

In the specific context of Shanghai, cultural values such as high respect for teachers, collectivism, and relationship-oriented norms (Li, X., 2024) may intensify this connection between teachers' self-efficacy in student engagement and their job satisfaction. When teachers are confident in their ability to inspire students and receive enthusiastic responses in return, these culturally embedded values may further reinforce their sense of professional worth and increase their job satisfaction.

6.3 The value of controlling for demographic variables in this study

This research did not verify the significant correlation between gender and job satisfaction. In past studies, the findings on the effect of gender on teachers' job satisfaction have been less consistent in different research contexts (Li & Cheng, 2020). However, Interestingly, with Shanghai data, work experience

was negatively associated with job satisfaction, indicating that as teachers gain more years in the profession, they may experience declining job satisfaction. This finding highlights the need for sustained career support mechanisms for teachers at different career stages. However, Ogedengbe et al. (2018) suggested that teachers with longer tenure were more satisfied with their jobs. Fattah (2010) found that the number of years a teacher had worked did not significantly impact job satisfaction. This inconsistency in findings suggests that the relationship between work experience and job satisfaction may be influenced by contextual factors such as educational policies, workload expectations (Bakker & Demerouti, 2017), professional development opportunities, and cultural differences (Hofstede, 2001). For instance, in regions where teachers receive ongoing training, career progression opportunities, and institutional support, longer tenure may lead to higher satisfaction. Conversely, in environments with limited professional growth, increasing bureaucratic demands, or stagnant career incentives, experienced teachers may face burnout and declining job satisfaction (Maslach & Leiter, 2017).

Moreover, individual differences in coping mechanisms (Lazarus, 1991), intrinsic motivation (Ryan & Deci, 2017), and job expectations (Skaalvik & Skaalvik, 2018) could also influence teachers' perceptions of their work. According to Demerouti et al. (2001) and the Job Demands-Resources model, some teachers find satisfaction as they develop expertise, while others become demotivated by routine tasks and lack of recognition.

6.4 Implications for practice

One of the key findings of this study is that teachers' self-efficacy in student engagement is the strongest predictor among the three sub-dimensions of teachers' job satisfaction. This suggests that teachers who feel confident in motivating and engaging students are more likely to experience higher levels of professional fulfillment. Considering this, when teachers are being trained the professional development opportunities that focus on student-centered instructional techniques should be prioritized to improve the self-efficacy in student engagement to activate students (Freeman et al., 2014). Teachers can promote collaborative learning environments by taking part in workshops, peer

coaching (Truesdale, 2003), and mentoring programs, where they can share best practices for activating student participation and motivation to build up higher self-efficacy in student engagement, improving their job satisfaction.

Another main finding is that more experienced teachers tend to have lower job satisfaction. This suggests that teachers who have been in the profession longer might feel less fulfilled over time. Therefore, long-term sustained career support mechanisms should be built to prevent teacher burnout and disengagement. According to Zhu (2019), teachers should have more flexibility in work arrangements since they have practical experience and established expertise. They should also have access to reduced workload pressures, a supportive work environment, and adequate mental health resources (Zhu, 2019). Additionally, clear career advancement opportunities are also important to keep their motivation, engagement and satisfaction in their profession.

Although teachers' self-efficacy in classroom management and instruction did not emerge as significant predictors in the multiple regression model likely due to multicollinearity, individual analyses still confirmed their positive contributions to job satisfaction. This highlights the need for continuous support in these areas, especially for early-career teachers. Therefore, to improve the teachers' self-efficacy in these dimensions, they can participate in targeted training in effective classroom management techniques and innovative instructional pedagogy. They should also get constructive feedback and ongoing coaching into their evaluation systems (Yin et al., 2019), to help refine their instructional and management skills to improve these dimensions in their self-efficacy. All the above-mentioned practices increase teachers' job satisfaction.

The importance of improving the whole school climate and working conditions should also be reinforced to enhance teachers' self-efficacy and teachers' job satisfaction (OECD, 2020). Schools should create a collaborative and inclusive work environment where teachers feel respected, valued and supported by their leaders and colleagues, while also establishing clear and fair performance evaluations (Yin et al., 2019).

Shanghai perceives teacher education as a lifelong journey and has invested in a comprehensive system to develop its educators professionally (Zhang, et al., 2013). Perhaps in the future, Shanghai could incorporate consideration of the relationship between teachers' self-efficacy and job satisfaction into its teacher education system, to develop a teaching force that is confident in their teaching abilities and satisfied with their profession and teaching environment, and to further improve the quality of education.

7 Limitations and future research

Regional focus

Shanghai is the most developed city in China and is relatively advanced in terms of economic and education policies ahead of other provinces and regions. Chinese cultures also totally differ from the Western world. Therefore, this study only examines teachers in Shanghai, which limits the generalizability of findings to other regions with different educational policies, economic conditions, and cultural contexts. The results in this study are not indicative of the situation in China as a whole. Future research should expand the scope to multiple regions or conduct cross-country comparisons to validate these findings.

Data timeliness and cross-sectional nature

This cross-sectional study relies on TALIS 2018 data, which may not fully capture recent changes in the teaching profession. Teachers' efficacy researchers have noted the need for more longitudinal studies of teacher efficacy as a method to demonstrate the development and stability of teacher efficacy (e.g., Henson 2002, Klassen et al., 2011). Particularly, the educational environments have changed after the COVID-19 pandemic. According to information on the official OECD website, the latest data collection for TALIS was scheduled for 2024, and its preliminary results will be released in October 2025. In the following research, longitudinal comparisons could be added using the TALIS 2024 data.

Model Limitations and Research Method

Although the regression models provide significant insights, their explanatory power remains moderate (highest $R^2 = 8.95\%$), suggesting that additional factors influence teachers' job satisfaction. The three dimensions of teachers' self-efficacy as independent variables also have multicollinearity, which may affect the interpretation of the results. Future studies should incorporate variables such as leadership styles, school climate, teacher workload stress, professional practices, and psychological well-being to develop a more comprehensive model (OECD, 2020; Li, 2022). In addition, quantitative

research methods have shortcomings. Klassen and his colleagues (2011) agreed with the ideas that qualitative teacher efficacy research was neglected, case studies and qualitative approaches can help understand how teacher efficacy beliefs operate deeply (Wheatley, 2005; Tschannen-Moran et al. 1998).

Potential Response Bias

The study is based on self-reported data, considering Shanghai's educational context and Chinese cultural factors, there is a possibility of social desirability bias. The participating teachers may provide answers that they perceive as favorable rather than their actual experiences. To avoid the bias, future studies should consider adding mixed-method approaches, combining surveys with qualitative interviews or observational studies (Singh, n.d.).

8 Conclusion

This study examined the relationship between teachers' self-efficacy and job satisfaction using data from the TALIS 2018 survey in Shanghai. The results reveal that teachers' self-efficacy is a significant factor in predicting job satisfaction, even when controlling demographic variables gender and work experience. Among the three dimensions of self-efficacy (classroom management, instruction, and student engagement), teachers' self-efficacy in student engagement was the strongest predictor of job satisfaction, indicating that student engagement is important in improving teachers' overall happiness and professional fulfillment. Furthermore, the results also show that as work experience increases, job satisfaction tends to decrease. Therefore, long-term career support mechanisms for teachers should be established to preserve teachers' motivation and job fulfillment over time.

The practical implications of this research extend beyond teachers to schools. To some extent, it may inspire relevant authorities in educational contexts similar to Shanghai. Targeted professional development, mentorship opportunities should be provided by schools and be actively participated in by teachers; the supportive working environments should also be created by schools and the whole society in a long term to improve teachers' self-efficacy, in turn, improve teachers' job satisfaction.

This study used cross-sectional data and only focused on teachers in Shanghai using a quantitative method and therefore lacks timeliness and representativeness across broader educational contexts. In the future, studies about this theme should incorporate longitudinal designs and compare various regions with mixed methods to validate these conclusions further.

Against the backdrop of China's rapid educational development, Shanghai—being at the forefront of educational reform and practice—has offered valuable references (such as high PISA results) for global education systems seeking to improve educational quality. Chinese President Xi Jinping points out that "teachers are the foundation of education and the source of its development". The construction of the teaching team is the most critical basic work for building

a strong country in education. This statement reflects the strong emphasis placed on educational development in China and other countries with similar sociocultural contexts. To build a strong country in education, it is essential to vigorously cultivate and create a high-quality and professional teaching team with noble professional ethics, superb skills, reasonable structure, and vitality (Zhong, 2025). Therefore, the demand for the relevant knowledge continues to grow to serve the shaping of national strategies. By examining the relationship between teachers' self-efficacy and job satisfaction, this study aims to further enhance teachers' job satisfaction, thereby reducing teacher turnover, increasing motivation, promoting the sustainable development of the teaching force, and seeking better educational outcomes.

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