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A Quantitative Model of Instructional Leadership and Job Satisfaction: Regression-Based Evidence from Private Primary Schools in China

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Abstract

Teachers' job satisfaction is crucial to ensuring high-quality education. Although headteachers' instructional leadership and teachers' professional development are widely recognized as key factors influencing teachers' job satisfaction, their interactive effects remain understudied, particularly in the context of private primary schools in China. Based on survey data from 350 private primary school teachers in Zhengzhou City, this study systematically examines how headteachers' instructional leadership and teachers' professional development influence teachers' job satisfaction. Structured scales were used to collect data. SPSS 26.0 and the PROCESS macro were employed for multiple regression and mediation effect analyses to examine both direct and indirect effects between variables. The results indicate that headteachers' instructional leadership and teachers' professional development both have significant positive effects on teachers' job satisfaction. Moreover, teachers' professional development partially mediates the relationship between headteachers' instructional leadership and teachers' job satisfaction. This suggests that school leaders can enhance teachers' job satisfaction not only through direct instructional guidance but also indirectly by promoting teachers' continuous professional growth. Overall, this study emphasizes the importance of supportive leadership and ongoing professional development opportunities in fostering teachers' job satisfaction and motivation. It enriches the literature on applied education studies in non-Western contexts and provides practical insights for improving teachers' retention and development practices in private educational settings.

Keywords: headteachers' instructional leadership; private primary schools; teachers' job satisfaction; teachers' professional development.

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1. Introduction

Teachers' job satisfaction generally refers to teachers' cognitive evaluation and adaptation to their work environment. It is a crucial factor influencing teacher retention, well-being, and teaching quality (Baroudi et al., 2022; Toropova et al., 2020; Harrision, 2023). In recent years, improving teachers' job satisfaction has become a key focus in basic education research and management.

According to China's 2024 National Education Development Statistical Bulletin, there are 152,800 private schools nationwide, accounting for 32.52%. Taking Zhengzhou as an example, there are currently 66 private primary schools with 80,900 students. As an important complement to public education, private schools play an increasingly significant role. However, private school teachers generally report lower satisfaction with salary, career development, leadership support, and job stability (Yang, 2023). This issue has become a major bottleneck limiting improvements in education quality.

Research shows that headteachers' instructional leadership not only promotes teachers' professional growth but also significantly affects their job satisfaction (Khan et al., 2023). Especially in private schools, where organizational structures are more flexible, leadership behaviors exert a more direct impact on teachers' attitudes. Teachers' professional development plays a crucial role in enhancing teachers' competencies and well-being. Its quality and availability directly shape their professional identity and teaching effectiveness (Li & Akram, 2023; Zhao, 2022). However, insufficient funding and weak policy support in private schools limit teachers' development opportunities, thereby worsening job satisfaction.

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1.1. Headteachers' Instructional Leadership and Teachers' Job Satisfaction

Headteachers' instructional leadership involves practices that enhance student outcomes by influencing teaching at both the classroom and school levels (Hallinger & Hosseingholizadeh, 2019). Early studies emphasized instructional quality, whereas recent research highlights its impact on teachers' well-being and job satisfaction (Liu et al., 2021). Headteachers can foster teacher satisfaction by offering recognition, autonomy, resources, a supportive climate, and opportunities for professional growth (Birhasani, 2022). However, empirical evidence from the Chinese context remains limited, especially regarding the mechanisms linking instructional leadership to job satisfaction. According to Path-Goal Theory, effective leadership clarifies goals, reduces obstacles, and enhances motivation. Thus, headteachers' instructional behaviours may reduce stress and improve teachers' job satisfaction (Karakus et al., 2024).

1.2 Teachers' Professional Development and Teachers' Job Satisfaction

Teachers' professional development includes school-based training, peer support, continuing education, and external learning. Research shows that frequent and diverse development opportunities enhance teachers' emotional satisfaction, well-being, and professional identity (Smet, 2022; Suarez, 2022; Zhao, 2022). Continuous, supportive development is linked to higher job satisfaction (Toropova et al., 2020).

According to Self-Determination Theory, such experiences fulfil psychological needs for autonomy, competence, and relatedness, thereby fostering intrinsic motivation (Battaglio et al., 2022). A supportive environment further promotes knowledge and performance (Hollar et al., 2022). In private schools, where teachers face greater workload and job instability, structured professional development is critical to improving satisfaction and retention (Lloyd et al., 2024).

1.3 Headteachers' Instructional Leadership and Teachers' Professional Development

In recent research, headteachers' instructional leadership has been identified as a key driver of teachers' professional development. Hallinger (2011) emphasized that effective leaders not only set instructional goals but also support teachers through resource coordination, motivation, and a learning-oriented culture. Kilag and Sasan (2023) further highlighted that such leaders promote teachers' professional development by modelling teaching, offering feedback, and fostering trust and collaboration.

According to Path-Goal Theory, headteachers promote teachers' professional growth by offering support, resources, and fostering a positive school culture (Nguyen et al., 2022). At the same time, research has gradually revealed the pathways through which instructional leadership indirectly affects teachers' job satisfaction via their professional development. When teachers feel supported and engaged in meaningful learning, they gain self-efficacy and job fulfillment (Zhang et al., 2020). Baharuddin et al. (2023) further confirmed that professional development partially mediates the link between integrative leadership and satisfaction.

Although previous studies have examined headteachers' instructional leadership and teachers' professional development regarding teachers' job satisfaction, systematic empirical research remains limited. In particular, little is known about whether headteachers' instructional leadership indirectly influences teachers' job satisfaction through professional development in private primary schools in China. This study focuses on private primary school teachers in Zhengzhou, China, analyzing how headteachers' instructional leadership and teachers' professional development affect job satisfaction, with emphasis on the mediating role of professional development. The paper aims to address the following research questions:

RQ1 : To what extent do headteachers' instructional leadership and teachers' professional development influence teachers' job satisfaction in private primary schools?

RQ2 : Do teachers' professional development mediate between headteachers' instructional leadership and teachers' job satisfaction?

Based on these research questions, the study proposes the following hypotheses:

H1 : Headteachers' instructional leadership has a significant positive effect on teachers' job satisfaction.

H2 : Teachers' professional development has a significant positive effect on teachers' job satisfaction.

H3 : Teachers' professional development partially mediates the relationship between headteachers' instructional leadership and teachers' job satisfaction.

Given that existing literature indicates that empirical studies on instructional leadership in non-Western contexts, especially in Asia, remain relatively scarce (Hallinger & Bryant, 2013; Hallinger & Chen, 2014; Hallinger et al., 2018; Hallinger et al., 2020). This study aims to enrich the evidence on headteachers' instructional leadership and teachers' job satisfaction in private schools in China, while providing theoretical insights and practical recommendations for related fields.

2. Methods

This study adopted a cross-sectional descriptive design, targeting full-time teachers in private primary schools in Zhengzhou, China.

2.1 Sample

As of 2024, Zhengzhou had 66 private primary schools with 3,106 full-time teachers. According to Krejcie and Morgan's (1970) sample size table, the recommended sample size is approximately 341. Stratified random sampling was applied. One school was randomly selected from each of the 12 administrative districts, and about 30 teachers were then randomly chosen from each school. The questionnaire was distributed electronically via the WJX online survey platform, with assistance from school administrators who forwarded the link. Finally, a total of 350 valid responses were collected.

To minimize non-response bias, anonymity was ensured, responses were limited to one per participant, and multiple reminders were sent. A pilot test with 10 teachers was conducted to ensure item clarity, and minor revisions were made based on their feedback. Consent was obtained from school headteachers and teachers, and the entire process adhered to relevant ethical standards.

2.2 Data collection instruments

Headteachers' instructional leadership (HIL) was assessed using the short version of the scale developed by Hallinger et al. (2015), which includes 22 items spanning three dimensions. Sample items include statements like "actively participates in reviewing course materials." Responses were captured using a five-point Likert scale (1 = strongly disagree to 5 = strongly agree).

Teachers' professional development (TPD) was measured using the Questionnaire on Professional Development of Primary School Teachers developed by Dai (2022). It includes four dimensions: teachers' professionalism, professional development needs, development opportunities, and external conditions. It contained 31 items, including statements such as "I always participate in high-quality training" and "I am diligent and motivated." TPD was measured using a five-point scale (1 = strongly disagree to 5 = strongly agree), where higher scores reflected greater engagement in development activities.

Teachers' job satisfaction (TJS) was assessed using the short version of the Minnesota Satisfaction Questionnaire (MSQ), which is widely adopted across various professions, including education (Ibikunle et al., 2022). In this study, the 20-item short form was used, and it featured statements such as "My salary is proportional to the amount of work I do" and "My work is fulfilling." The scale comprises two dimensions—intrinsic and extrinsic satisfaction—and employs a five-point Likert scale (1 = very dissatisfied to 5 = very satisfied), with higher scores indicating greater levels of job satisfaction.

This study assessed the reliability and validity of the three scales. All scales showed excellent internal consistency, with Cronbach's alpha values above 0.96. EFA results confirmed structural validity (KMO = 0.972, cumulative variance explained = 61.97%), and no serious common method bias was detected. CFA further supported construct validity, all factor loadings exceeded 0.6, AVE values were above 0.5, and CR values exceeded 0.7, with discriminant validity confirmed. Model fit indices (e.g., $\chi^2/df = 1.093$, CFI = 0.988, RMSEA = 0.016, GFI = 0.831) also indicated a good overall fit. Thus, the scales are reliable and valid for further analysis. In addition, to ensure the applicability of the scales among Chinese primary school teachers, this study conducted forward-backward translation of all questionnaires and made minor adjustments to some items to enhance clarity and cultural relevance.

2.3 Statistical analysis

In this research, multiple linear regression analysis was employed. The aim was to assess how HIL and TPD predict levels of TJS. The regression model was formulated as follows (Eq. 1).

$$TJS = \beta_0 + \beta_1 * HIL + \beta_2 * TPD + \varepsilon \quad (1)$$

This study also examined whether TPD mediates the effect of HIL on TJS. The PROCESS macro was used for the analysis. The analysis applied both maximum likelihood estimation and bootstrapping with 5,000 resamples. The mediating effect was considered significant if the 95% bootstrap confidence interval did not contain zero.

3. Results

3.1. Descriptive and Correlation analysis of main variables

Table 1 presents the descriptive statistics of the main variables in this study. The mean values for headteachers' instructional leadership (HIL), teachers' professional development (TPD), and teachers' job satisfaction (TJS) were 3.18, 3.29, and 3.22, respectively, with standard deviations of approximately 0.9. This indicates that the distribution of each variable was relatively balanced, without extreme deviations. As noted earlier, the questionnaire used in this study demonstrated high reliability and validity and was therefore appropriate for empirical analysis of the sample.

Table 1. Descriptive analysis of main variables.

	N	Minimum	Maximum	Mean	Standard deviation
HIL	350	1.27	4.77	3.18	0.88
TPD	350	1.48	4.77	3.29	0.87
TJS	350	1.35	4.85	3.22	0.89

Based on this, to further explore the potential relationships among the main variables, this study conducted a correlation analysis, and the results are presented in Table 2. The findings show that HIL is significantly positively correlated with TPD ($r = 0.256$, $p < 0.01$) and TJS ($r = 0.295$, $p < 0.01$). Additionally, TPD is significantly and positively correlated with TJS ($r = 0.272$, $p < 0.01$). These results suggest that stronger HIL not only promotes teachers' professional growth but also enhances their job satisfaction, while TPD likewise contributes positively to TJS.

Table 2. Pearson correlation coefficients.

	HIL	TPD	TJS
HIL	1	0.256**	0.295**
TPD	0.256**	1	0.272**
TJS	0.295**	0.272**	1

3.2. Hypothesis Testing

The correlation analysis confirmed significant interrelationships among the variable groups. Therefore, regression analysis was conducted using SPSS 26, and the results are presented as follows:

Table 3. Linear regression analysis: HIL on TPD.

	Unstandardized coefficients		Standardized coefficients	t	p	Collinearity statistics	
	B	Std. Error	Beta			VIF	Tolerance
Constant	2.492	0.168	-	14.842	0.000**	-	-
HIL	0.252	0.051	0.256	4.941	0.000**	1.000	1.000
R^2				0.066			
Adjusted R^2				0.063			
F				F (1,348) =24.417, p=0.000			
D-W value				0.516			

Note: Dependent variable = TPD.
*p<0.05 **p<0.01

As shown in Table 3, linear regression analysis revealed that HIL significantly predicted TPD ($B = 0.252$, $\beta = 0.256$, $p < 0.01$). Specifically, each one-unit increase in HIL was associated with a 0.252-unit increase in TPD. The F-value was 24.417 ($p < 0.01$), indicating that the model was significant overall. Collinearity diagnostics showed that the VIF and tolerance values were both 1, indicating no multicollinearity issues. The Durbin–Watson statistic was 0.516, suggesting strong positive autocorrelation in the residuals, which should be considered when interpreting the regression estimates. The corresponding regression model is as follows (Eq. 2):

$$TPD = 2.492 + 0.252 * HIL + \varepsilon \quad (2)$$

These results indicate that HIL has a significant positive impact on TPD. This finding supports the subsequent test of the mediating role of TPD between HIL and TJS.

Table 4. Linear regression analysis of variables on TJS.

	Unstandardized coefficients		Standardized coefficients	t	p	Collinearity statistics	
	B	Std. Error	Beta			VIF	Tolerance
Constant	1.733	0.213	-	8.145	0.000**	-	-
HIL	0.244	0.052	0.242	4.661	0.000**	1.070	0.934
TPD	0.216	0.053	0.210	4.054	0.000**	1.070	0.934
R^2				0.129			
Adjusted R^2				0.124			
F				F (2,347) =25.596, p=0.000			
D-W value				1.681			

Note: Dependent variable = TJS.
*p<0.05 **p<0.01

Linear regression analysis was conducted to assess the impact of HIL and TPD on TJS. Table 4 indicates that both HIL ($\beta = 0.242$, $p < 0.01$) and TPD ($\beta = 0.210$, $p < 0.01$) significantly and positively predicted TJS. Together, they accounted for 12.4% of the variance (adjusted $R^2 = 0.124$), with the overall model reaching statistical significance ($F = 25.596$, $p < 0.01$). Multicollinearity and autocorrelation diagnostics were within acceptable ranges (VIF = 1.070, Durbin–Watson = 1.681). The regression model is as follows (Eq. 3).

$$TJS = 1.733 + 0.244 * HIL + 0.216 * TPD + \varepsilon \quad (3)$$

These results support H1 and H2. They indicate that both HIL and TPD have a significant positive impact on TJS.

The mediation effect was first investigated using stratified regression to examine how the coefficient of the independent variable changes after adding the mediating variable, thereby initially determining whether a mediation effect exists. Additionally, a 5,000-sample bootstrap was used to test the size and significance of the mediation effect. The indirect impact was deemed significant if the 95% confidence interval did not include zero. The results are shown in Table 5.

Table 5. Mediation effect model test.

	TJS	TPD	TJS
Constant	2.270** (13.341)	2.492** (14.842)	1.733** (8.145)
HIL	0.298** (5.769)	0.252** (4.941)	0.244** (4.661)
TPD			0.216** (4.054)
Sample size	350	350	350
R^2	0.087	0.066	0.129
Adjusted R^2	0.085	0.063	0.124
F-value	F (1,348) =33.283, p=0.000	F (1,348) =24.417, p=0.000	F (2,347) =25.596, p=0.000

Note: * p<0.05 ** p<0.01, t-values in parentheses

This study used hierarchical regression analysis to test whether TPD partially mediates the relationship between HIL and TJS. The results showed that HIL significantly predicted TJS ($\beta = 0.298$) and TPD ($\beta = 0.252$). After introducing the mediator, the direct effect of HIL on TJS decreased to $\beta = 0.244$ ($p < .01$). At the same time, the impact of TPD remained significant ($\beta = 0.216$). Bootstrap testing confirmed that professional development mediated 18.3% of the total impact (95% CI [0.07, 0.25]). This result indicates that HIL not only directly affects TJS but also indirectly enhances it by promoting TPD. The final model explained 12.9% of the variance in job satisfaction ($R^2 = 0.129$, $F (2, 347) = 25.596$, $p < .01$). The detailed mediation statistics are shown in Table 6.

Mediation analysis examined how HIL influences TJS. As shown in Table 6, the total effect was 0.298 ($p < 0.01$), with a 95% confidence interval (CI) of [0.196, 0.399], which confirmed significance. The direct effect remained significant at 0.244 ($p < 0.01$, CI [0.141, 0.346]). The indirect effect, mediated by TPD, was 0.054 ($p < 0.01$, CI [0.025, 0.088]),

which also excluded zero. These results indicate a significant partial mediation. The results support hypothesis H3, showing that HIL enhances TJS directly and indirectly through TPD. The mediation model with standardized coefficients is illustrated in Fig. 1.

Table 6. Summary of mediation effect tests.

Path	Effect type	Effect	se	LLCI	ULCI
HIL→TPD→TJS	Total effect	0.298	0.052	0.196	0.399
	Direct effect	0.244	0.052	0.141	0.346
	Indirect effect	0.054	0.015	0.025	0.088

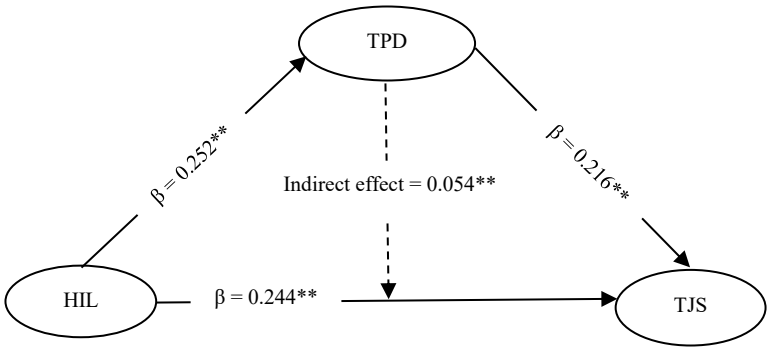

Fig. 1. Mediation model path diagram.

Note: Path values are standardized regression coefficients (β). Indirect effect = 0.054** (95% CI [0.025, 0.088]); Direct effect = 0.244** (95% CI [0.141, 0.346]); Total effect = 0.298** (95% CI [0.196, 0.399]).
**$p < .01$.

4. Discussion

Based on the findings of this study in private primary schools in Zhengzhou City, it is recommended that headteachers pay greater attention to instructional leadership in daily management. They should also create an environment that supports teachers' growth and promotes participation in professional development activities to enhance job satisfaction. At the same time, schools can organize regular training, teaching seminars, and developmental assessments to build a continuous growth path for teachers. Such initiatives indirectly improve education quality and enhance teachers' well-being by strengthening their professionalism.

Since China's reform and opening-up, private primary schools have rapidly grown as a key complement to basic education. Recent policies like the Implementing Regulations for the Law on the Promotion of Private Education (State Council of the People's Republic of China, 2021) and the "Double Reduction" policy (The General Office of the State Council of the People's Republic of China, 2021) have tightened regulations, emphasizing educational fairness, teacher development, and students' holistic growth. Private schools now share equal educational responsibilities with public schools, prompting administrators to rethink how instructional leadership and teacher professional development work together to improve education quality and teacher performance.

In the traditional system, teachers focused mainly on classroom teaching. Current reforms, however, require them to engage more in curriculum reform, school-based learning, and research activities (Zhou, 2024). Research suggests that such changes have exacerbated the complexity of teachers' work, as well as greatly increased expectations for instructional leadership among school leaders (Ralebese et al., 2025).

Although private schools face challenges such as high turnover, limited training, and restricted promotion, many teachers still report high job satisfaction, supported by strong leadership and collaborative environments (Mohammad & Borkoski, 2024). It has been noted that the key to teachers' satisfaction lies not only in material incentives but is also significantly influenced by headteacher leadership style and teachers' professional development opportunities (Paganin et al., 2025). Building on this foundation, this study proposes and empirically tests a mediation model linking headteachers' instructional leadership with teachers' professional development and job satisfaction.

First, the study found that the instructional leadership of private primary school headteachers had a significant positive effect on teachers' job satisfaction. This supports Khan et al.'s (2023) conclusion that such leadership strengthens teachers' professional identity and engagement by clarifying goals, providing support, and monitoring classroom practices. However, this result differs from Wu's (2023) study, which did not find a significant relationship between the two. This discrepancy may be due to differences in school types, regional contexts, or sample compositions. This suggests that institutional environments and organizational structures may moderate the relationship between headteachers' instructional leadership and teachers' job satisfaction.

Further analysis showed that teachers' professional development significantly boosts job satisfaction by enhancing autonomy, competence, and belonging, in line with Self-Determination Theory. However, this differs from Smet (2022), who found that different developmental needs affect satisfaction differently: diversified teaching needs show a positive but diminishing effect with frequent participation, while subject teaching needs may have a negative effect, moderated by higher participation. Therefore, teachers' professional development support should focus on teachers' specific needs and psychological satisfaction.

In addition, this study confirmed that headteachers' instructional leadership was a significant positive predictor of teachers' professional development. This result is consistent with Ahmad et al.'s (2021) study and further highlights the important role of headteachers in setting the direction of teacher development, organizing learning resources, and creating a learning culture. Headteachers' instructional leaders oversee curriculum and instruction, but also guide teachers' professional development—an especially critical role in resource-limited private schools.

Of interest is that headteachers' instructional leadership may further indirectly enhance teachers' job satisfaction by promoting their professional growth and instructional autonomy. Teachers are more intrinsically motivated when their contributions are recognised, when they participate in school affairs, and when they have autonomy over teaching strategies and curriculum (Fradkin-Hayslip, 2021). Teachers' overall job satisfaction is significantly higher when they have growth opportunities, supportive teaching resources, and space for instructional autonomy, consistent with previous research (Worth & Van den Brande, 2020).

This study found that teachers' professional development mediates the link between headteachers' instructional leadership and teachers' job satisfaction by enhancing skills, confidence, and belonging. In competitive private schools, structured support helps teachers realize their value. Instructional leaders foster satisfaction by promoting collaboration, growth opportunities, and a professional culture, especially crucial in resource-limited settings. At the policy level, the Guidelines for the Evaluation of Compulsory Education Quality (Ministry of Education of the People's Republic of China, 2021) emphasize instructional improvement and ongoing development, reinforcing the vital role of instructional leadership in strengthening school capacity and teacher quality. Headteachers' instructional leadership indirectly enhances teachers' job satisfaction by supporting their professional development. This provides new insights into teacher motivation in private primary education and practical guidance for improving education quality and teacher team building under the "Double Reduction" policy.

5. Conclusion

This study focuses on teachers at private primary schools in Zhengzhou, China. Drawing on Path–Goal Theory and Self-Determination Theory, it constructs a model to examine how headteachers' instructional leadership influences teachers' professional development and job satisfaction. The results indicate that both headteachers' instructional leadership and teachers' professional development positively impact teachers' job satisfaction. Moreover, teachers' professional development plays a partial mediating role in this relationship. The study highlights the positive effects of headteachers' instructional leadership and teachers' professional development on teachers' job satisfaction. It also enriches leadership theory in non-Western contexts and provides practical guidance for enhancing teacher support.

However, this study has several limitations. First, the sample was limited to teachers from several private primary schools in Zhengzhou, which may reduce its representativeness. The applicability of the findings to other regions and types of schools requires further validation. Second, the data were primarily obtained through teacher-completed questionnaires, which may introduce social desirability and other subjective biases. Third, due to the cross-sectional survey design, causal inferences are limited. Future studies could employ longitudinal data or mixed-methods approaches to enhance the robustness of the conclusions. Finally, the Durbin–Watson statistic (0.516) indicates potential positive autocorrelation, which may affect the robustness of the regression results. Future research could consider employing more advanced econometric methods to address this issue.

In summary, this study provides empirical evidence on the mechanisms affecting job satisfaction among private primary school teachers. It also offers practical guidance for educational management and points to directions for future, more extensive research across different regions and school types.

Conflicts of Interest: The authors declare that they have no conflicts of interest to report regarding the present study.

Contribution: XL: concept and design, data acquisition, data analysis, drafting manuscript, critical revision of manuscript, statistical analysis. **AH:** concept and design, admin, technical or material support, supervision, final approval. **YM:** concept and design, technical or material support, supervision.

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