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THE IMPACT OF PRINCIPALS' INSTRUCTIONAL LEADERSHIP ON TEACHERS' SELF-EFFICACY AND STUDENTS' AFFECTIVE LEARNING OUTCOMES: A MEDIATED MODEL IN CHINESE HIGHER VOCATIONAL COLLEGES

O IMPACTO DA LIDERANÇA INSTRUCIONAL DOS DIRETORES NA AUTOEFICÁCIA DOS PROFESSORES E NOS RESULTADOS DE APRENDIZAGEM AFETIVA DOS ALUNOS: UM MODELO MEDIADO EM INSTITUIÇÕES DE ENSINO SUPERIOR PROFISSIONALIZANTE CHINESAS

EL IMPACTO DEL LIDERAZGO INSTRUCCIONAL DE LOS DIRECTORES EN LA AUTOEFICACIA DOCENTE Y EN LOS RESULTADOS DE APRENDIZAJE AFECTIVO DE LOS ESTUDIANTES: UN MODELO MEDIADO EN INSTITUCIONES CHINAS DE EDUCACIÓN SUPERIOR PROFESIONALIZANTE

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ABSTRACT: This research investigates how principals' instructional leadership (PIL) influences students' affective learning outcomes (ALO), focusing particularly on the mediating effect of teachers' self-efficacy (TSE) within the context of higher vocational colleges in China. A conceptual model was developed to examine the relationships among PIL, TSE, and ALO. Data were obtained through a structured survey completed by 406 full-time teachers from public vocational institutions. Structural equation modeling (SEM) was employed for data analysis. The results indicated that PIL has a significant positive impact on TSE, and both PIL and TSE significantly affect ALO. Furthermore, TSE was found to partially mediate the link between PIL and ALO. The study makes a theoretical contribution by combining leadership and motivation frameworks and provides practical insights for strengthening instructional leadership to boost teacher self-efficacy and students' emotional engagement in learning.

KEYWORDS: Principals' instructional leadership. Teachers' self-efficacy. Affective learning outcomes. Mediated model. Vocational education.

RESUMO: *Esta pesquisa investiga como a liderança instrucional dos diretores (LID) influencia os resultados de aprendizagem afetiva dos alunos (RAA), concentrando-se especialmente no efeito mediador da autoeficácia docente (AED) no contexto das instituições de educação superior vocacional da China. Um modelo conceitual foi desenvolvido para examinar as relações entre o LID, a AED e os RAA. Os dados foram obtidos por meio de uma pesquisa estruturada completada por 406 professores em tempo integral de instituições vocacionais públicas. A modelagem de equações estruturais (MEE) foi empregada para a análise de dados. Os resultados indicaram que o LID tem um impacto positivo significativo na AED, e tanto o LID quanto a AED afetam significativamente os RAA. Além disso, constatou-se que a AED medeia parcialmente a relação entre o LID e os RAA. O estudo faz uma contribuição teórica ao combinar marcos de liderança e motivação, e fornece insights práticos para fortalecer a liderança instrucional, visando aumentar a autoeficácia docente e o engajamento emocional dos alunos na aprendizagem.*

PALAVRAS-CHAVE: *Liderança instrucional dos diretores. Autoeficácia docente. Resultados de aprendizagem afetiva. Modelo mediador. Educação vocacional.*

RESUMEN: *Esta investigación analiza cómo el liderazgo instruccional de los directores (LID) influye en los resultados de aprendizaje afectivo de los estudiantes (RAA), con especial atención al efecto mediador de la autoeficacia docente (AED) en el contexto de las instituciones chinas de educación superior vocacional. Se desarrolló un modelo conceptual para examinar las relaciones entre el LID, la AED y los RAA. Los datos se obtuvieron mediante una encuesta estructurada completada por 406 docentes de tiempo completo de instituciones vocacionales públicas. Para el análisis de datos se empleó la modelización de ecuaciones estructurales (MEE). Los resultados indicaron que el LID tiene un impacto positivo significativo en la AED y que tanto el LID como la AED influyen de manera significativa en los RAA. Además, se constató que la AED media parcialmente la relación entre el LID y los RAA. El estudio aporta una contribución teórica al integrar referencias de liderazgo y motivación, y ofrece orientaciones prácticas para fortalecer el liderazgo instruccional, con o objetivo de incrementar la autoeficacia docente y el involucramiento emocional de los estudiantes en su proceso de aprendizaje.*

PALABRAS CLAVE: *Liderazgo instruccional de los directores. Autoeficacia docente. Resultados de aprendizaje afectivo. Modelo mediador. Educación vocacional.*

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INTRODUCTION

Instructional leadership is a purposeful approach to school leadership that prioritizes the improvement of teaching quality and student learning outcomes. It emphasizes establishing clear academic objectives, overseeing instructional practices, and fostering a positive and supportive school environment (Hallinger, 2011). Moreover, instructional leadership is increasingly valued not only for its influence on academic achievement but also for its positive effects on teacher morale and student engagement (Naz & Rashid, 2021).

In China, the expansion and transformation of vocational education have brought instructional leadership to the forefront. Since the implementation of the "Double High-Level Plan" and the "National Vocational Education Reform Implementation Plan" (Ministry of Education, 2019), school leaders in higher vocational institutions face new pressures to deliver high-quality education while attending to student development and teacher morale. However, top-down, administratively heavy leadership remains prevalent, often failing to consider teacher agency, emotional demands, and professional autonomy. Such limitations have contributed to rising dissatisfaction among teachers and disengagement among students, particularly in emotionally demanding classrooms (Lin & Mohammad, 2023).

One of the emerging focal points in this discourse is teachers' self-efficacy—the belief in their ability to organize and execute tasks to achieve teaching success (Bandura, 1997). Prior research confirms that instructional leadership fosters self-efficacy through goal clarity, professional feedback, and supportive environments (Leithwood & Jantzi, 2008). Self-efficacious teachers are more likely to adopt innovative practices, manage classroom dynamics effectively, and create emotionally responsive learning environments (Tschannen-Moran & Hoy, 2001). These conditions directly shape students' affective learning outcomes (ALO), including emotional engagement, sense of belonging, and perceptions of teacher–student relationship quality (Pianta, 2001).

Despite growing interest in both instructional leadership and self-efficacy, few studies have explored how these variables jointly influence affective learning outcomes, particularly in Chinese higher vocational institutions. The dominant focus remains on cognitive achievement, neglecting students' emotional and social development. Moreover, the mediating role of teachers' self-efficacy in this process remains under-theorized and empirically under-examined, especially in relation to leadership-driven affective change (Liu et al., 2022). This gap is particularly salient as China's education policy increasingly emphasizes student-centered, emotionally safe learning environments.

In response, this study aims to investigate the impact of principals' instructional leadership (PIL) on students' affective learning outcomes (ALO), with teachers' self-efficacy (TSE) serving as a mediating variable. By examining this relationship within the specific context of

Chinese higher vocational colleges, the study contributes to both theory and practice. The study questions are as follows:

RQ1: How does principals' instructional leadership affect teachers' self-efficacy in vocational colleges?

RQ2:How does teachers' self-efficacy affect students' affective learning outcomes?

RQ3: Does teachers' self-efficacy mediate the relationship between instructional leadership and affective learning outcomes?

LITERATURE REVIEW

This study is structured around three core conceptual variables: the instructional leadership practices of vocational college principals, teachers' self-efficacy, and students' affective learning outcomes. These variables are analyzed in depth to understand their interrelations and implications for emotional and relational aspects of teaching and learning in Chinese vocational higher education.

Principals' Instructional Leadership

Principals' instructional leadership, as the independent variable in this study, is conceptualized using Hallinger's model (2011), which highlights three core functions: defining the school mission, managing the instructional program, and promoting a positive school climate. These dimensions reflect a leadership approach centered on academic quality, teacher development, and student-focused reform. Specifically, defining the mission involves articulating clear educational goals and shared visions; managing instruction encompasses supervision, coordination, and evaluation of teaching activities; and promoting a positive climate includes creating a collegial and supportive environment that fosters student engagement and teacher morale.

This tripartite model has been adapted in the context of Chinese vocational education to capture the active leadership roles principals play amid national reforms. In this study, these three dimensions serve as the analytical basis for examining how instructional leadership contributes to teachers' beliefs about their professional competence and ultimately affects students' emotional and motivational learning experiences.

Teachers' Self-Efficacy

Teachers' self-efficacy is positioned as the mediating variable, representing teachers' beliefs in their ability to effectively plan, organize, and execute instructional tasks to achieve desired educational outcomes. Drawing upon Bandura (1997) Social Cognitive Theory, self-efficacy is conceptualized through three interrelated domains: efficacy in instructional strategies, classroom management, and student engagement (Tschannen-Moran & Hoy, 2001). Teachers with high self-efficacy are more likely to persist through challenges, adopt innovative practices, and create emotionally responsive learning environments.

In this study, self-efficacy functions as the key psychological mechanism linking instructional leadership to students' affective learning outcomes. Principals who provide pedagogical support, professional feedback, and emotional encouragement can significantly enhance teachers' self-perception of competence (Leithwood & Jantzi, 2008). This internal belief, in turn, influences how teachers interact with students, estabilish emotional bonds, and maintain motivation within the classroom.

Students' Affective Learning Outcomes

In this study, students' affective learning outcomes (ALO) are conceptualized based on Pianta (2001) Student–Teacher Relationship framework, focusing on the emotional quality of student–teacher interactions. Unlike broader definitions that include motivation or attitude, this study emphasizes two key relational dimensions: closeness and conflict.

Closeness refers to students perceived warmth, trust, and support from teachers, fostering emotional safety, engagement, and well-being (Koomen et al., 2012). In contrast, conflict captures emotional tension, misunderstanding, and frustration in the student–teacher relationship, often linked to anxiety and disengagement (Hamre & Pianta, 2001).

These dimensions offer a relational view of emotional development, particularly relevant in China's higher vocational colleges, where many students face emotional challenges tied to socioeconomic background (Xiong, 2021; Cheng, 2023). In this study, ALO is measured using adapted items from the Student–Teacher Relationship Scale (STRS). The analysis explores how principals' instructional leadership and teachers' self-efficacy indirectly shape students' affective learning by influencing the classroom's emotional climate.

Theoretical Framework

Theoretical framework of this study integrates three key theories—Path–Goal Theory (House, 1996), Social Cognitive Theory (Bandura, 1997), and Self-Determination Theory (Deci & Ryan, 2000)—to systematically explain the relationships among principals' instructional

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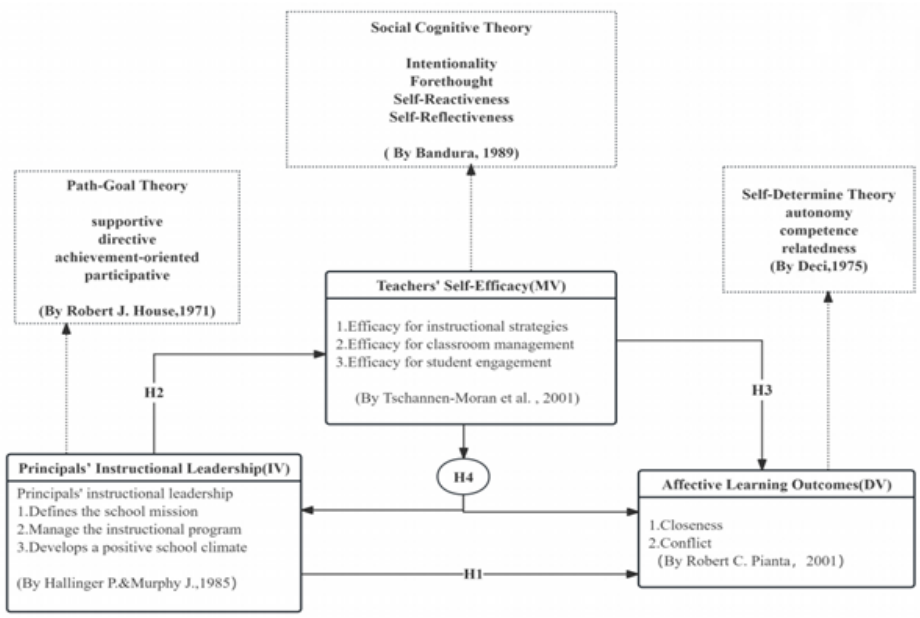
leadership (PIL), teachers' self-efficacy (TSE), and students' affective learning outcomes (ALO). Rather than focusing on each theory individually, the framework emphasizes their collective contribution to understanding how leadership behaviors influence both teacher motivation and student emotional engagement.

The integrated model suggests that instructional leadership affects students' affective learning outcomes through two primary pathways: a direct influence and an indirect influence mediated by teachers' self-efficacy. TSE is positioned as the central mediating mechanism linking leadership practices to students' emotional experiences in the learning environment. As illustrated in Figure 1, this dual-path structure provides a clear and theoretically grounded basis for empirical testing, offering a holistic view of how leadership, teacher beliefs, and student outcomes are interconnected. See Figure 1.

Figure 1
Theoretical and Conceptual model



Note. Elaborated by authors (2025).

The impact of instructional leadership on teacher self-efficacy

Instructional leadership has been widely examined in the context of school improvement and teacher development (Hallinger, 2011). It emphasizes goal setting, instructional supervision, professional support, and the creation of a positive school climate—factors shown to enhance teachers' sense of agency and competence (Tschannen-Moran & Hoy, 2001). When teachers perceive that principals provide clear instructional direction, recognize their expertise, and facilitate collaborative practices, their self-efficacy improves significantly (Liu et al., 2022). Empirical evidence from Chinese schools highlights that principals who actively involve

teachers in curriculum decisions and classroom strategies positively influence teachers' instructional confidence.

The impact of principals' instructional leadership on students' affective learning outcomes

Principals' instructional leadership indirectly influences students by enhancing teachers' psychological and professional well-being. Teachers who receive strong instructional support are more motivated, emotionally engaged, and relationally responsive, thereby fostering positive student affective outcomes (Pianta, 2001). Within China's ongoing vocational education reform—driven by the National Vocational Education Reform Implementation Plan and the Double High-level Plan (MOE, 2020)—instructional leadership has emerged as a key mechanism for improving pedagogy, teacher development, and student learning (Tan & Liu, 2021; Zhao & Yuan, 2023). Compared with traditional administrative models, this leadership approach promotes relational trust and learning-centered governance, contributing to students' emotional connectedness and sense of belonging (Hallinger, 2011; Liu & Hallinger, 2020; Li & Wei, 2023).

The relationship between teacher self-efficacy and student affective learning outcomes

Teacher self-efficacy is closely linked to students' affective engagement, emotional well-being, and satisfaction with learning experiences. Teachers who believe in their instructional and classroom management abilities tend to create inclusive, emotionally supportive environments that promote motivation and positive relationships (Tschannen-Moran & Hoy, 2001). Empirical and meta-analytic studies confirm that higher teacher efficacy enhances students' interest and engagement, whereas low efficacy is associated with stress, conflict, and weaker affective outcomes (Zhu & Jiang, 2015). Cross-national evidence further indicates that in low-resource vocational contexts, teacher efficacy remains a strong predictor of student affective outcomes (Kumar et al., 2024), and emerging frameworks increasingly integrate emotional and contextual factors into its measurement.

Teacher self-efficacy as a mediating factor

Teachers' self-efficacy (TSE) is widely recognized as a key psychological mechanism mediating the relationship between school leadership and student outcomes. Rooted in Bandura (1997) Social Cognitive Theory, TSE reflects teachers' beliefs in their capacity to organize and execute instructional tasks and manage classroom challenges. Leadership behaviors that

promote collaboration, provide instructional guidance, and demonstrate trust in teachers have been shown to enhance teachers' self-efficacy (Tschannen-Moran & Hoy, 2001).

Recent studies highlight TSE's mediating role between principals' instructional leadership and various student-level outcomes, particularly those related to affective development. For instance, Choi and Yang (2023) found that principals' instructional practices influenced students' emotional engagement indirectly through teachers' perceived efficacy. Similarly, Ma et al. (2023) confirmed that when teachers believe they are effective, they are more likely to implement emotionally responsive strategies, contributing to positive classroom climates.In the Chinese context, Liu et al. (2022) observed that teacher efficacy mediates the effect of principal leadership on both student engagement and teacher–student relationship quality. These findings suggest that empowering teachers' sense of competence is a critical pathway through which instructional leadership fosters better affective outcomes for students.

METHODOLOGY AND RESEARCH HYPOTHESES

Based on the theoretical framework and prior literature discussed in previous sections, this study proposes the following four hypotheses:

- Ha1: Principals' Instructional leadership positively impacts teachers' self-efficacy;
- Ha2: Principals' Instructional leadership positively impacts students' affective learning outcomes;
- Ha3: Teachers' self-efficacy positively impacts students' affective learning outcomes;
- Ha4: Teachers' self-efficacy mediates the relationship between principals' instructional leadership and students' affective learning outcomes.

Research Instruments

This study adopts a quantitative approach using a structured survey instrument to examine the relationships among instructional leadership, teachers' self-efficacy, and students' affective learning outcomes. The questionnaire consisted of four main parts:

Demographic Variables: Five items captured teacher-related background information such as gender, age, academic qualification, years of teaching experience, teaching discipline, and institutional location.

Instructional Leadership Scale: A 18-item scale adapted from Hallinger's (2000) Principal Instructional Management Rating Scale (PIMRS) was used to measure teachers' perceptions

of their principal's leadership. Items were revised to reflect the vocational education context in Jiangxi, China.

Teachers' Self-Efficacy Scale: This 12-item measure was developed based on Tschannen-Moran and Hoy (2001), including three dimensions: instructional strategies, classroom management, and student engagement. The scale was validated for the local educational culture.

Students' Affective Learning Outcomes Scale: A modified version of the Student–Teacher Relationship Scale (Piant, 2011; Koomen et al., 2012) with 10 items was used, emphasizing closeness and conflict. Fifteen items assessed how teachers perceived emotional engagement and connection in their classrooms.

Research Subjects

This study selected multiple regions across China as the target areas for its survey, considering the overall development status and representatives of China's vocational education system. These regions cover different geographical locations and have a large number of higher vocational colleges that are actively involved in national reforms such as the "Double High-Level Plan" and the "Modern Vocational Education Development Strategy," making them representative samples for studying leadership and affective learning outcomes in Chinese higher vocational colleges.

A stratified random sampling method was employed to ensure the sample's representatives. The sampling strata included different higher vocational colleges, considering variables such as institutional size, academic programs, and teacher demographics. A total of 414 questionnaires were distributed to teachers across these institutions. Out of these, 406 were returned and deemed valid, yielding an effective response rate of 98.07%. This sample size exceeds the minimum requirement recommended for structural equation modeling (SEM), thus ensuring statistical power and robustness (Hair et al., 2013). The sample also adequately reflects the diversity of faculty in Chinese higher vocational education sector, contributing to the generalization of the study's findings.

Data Analysis Methods

To examine the relationships among principals' instructional leadership (PIL), teachers' self-efficacy (TSE), and students' affective learning outcomes (ALO), this study employed a series of quantitative data analysis techniques using SPSS 26.0 and AMOS 23.0.

Key indicators such as means, standard deviations, and frequency distributions were calculated for the three main variables: principals' instructional leadership, teachers' self--effective and students' affective learning outcomes.

Inferential statistical methods were used to assess group differences, associations among core variables, and predictive pathways. Pearson correlations identified relationships among PIL, TSE, and ALO. Multiple regression tested direct and mediating effects, and Structural Equation Modeling (SEM) validated the hypothesized model. Confirmatory Factor Analysis (CFA) assessed construct reliability and model fit, ensuring a robust analysis of both observed and latent variables.

Structural Equation Modeling (SEM) using AMOS 23.0 was employed to conduct path analysis and test the mediating effect of teachers' self-efficacy on the relationship between principals' instructional leadership and students' affective learning outcomes.

The results of these analyses were presented in tables and figures to provide clear insights into the relationships among variables. These methods enhance the precision and robustness of the findings, offering a comprehensive understanding of both the direct and indirect effects of instructional leadership on students' affective learning outcomes.

RESULTS

Reliability and Validity Testing

A total of 414 questionnaires were distributed to teachers in higher vocational colleges. Of these, 406 were completed and returned validly, yielding an effective response rate of 98.07%. In this study, Cronbach's Alpha coefficients for Principals' Instructional Leadership, Teachers' Self-Efficacy, and Affective Learning outcomes were 0.924, 0.896, and 0.897, respectively, all exceeding the widely accepted threshold of 0.89. This indicates a high to very high internal consistency, as all values exceeded the commonly accepted threshold of 0.80 (DeVellis, 2017). This suggests that the instruments used were reliable for assessing the respective constructs.

The validity of the scales for Principals' Instructional Leadership, Teachers' Self-Efficacy and Affective Learning Outcomes J was thoroughly examined to ensure the factor structures aligned with the data. An Exploratory Factor Analysis (EFA) was first conducted to assess the construct validity.

The Kaiser-Meyer-Olkin (KMO) values for PIL, TSE, and ALO were 0.936, 0.905, and 0.912, respectively—well above the 0.90 threshold, indicating excellent sampling adequacy (Kaiser, 1974). Bartlett's Test of Sphericity for each construct was statistically significant ($p = 0.000 < 0.001$), confirming that the data were appropriate for factor analysis (Hair et al., 2013). The KMO and Bartlett tests verified the validity of each construct, with the overall validity of the questionnaires described as excellent.

Subsequently, a Confirmatory Factor Analysis (CFA) was performed to evaluate the model's fit. The fit indices for all models were within the recommended thresholds (/df < 3, CFI > 0.90, TLI > 0.90, RMSEA < 0.08), demonstrating satisfactory model validity (Hu & Bentler, 1999). These results confirm the effectiveness of the scales in accurately measuring Principals' Instructioal Leadership, Teachers' Self-Efficacy, and Affective Learning Outcomes. The detailed data and fit indices are presented in Table 2.

Table 2
Validity testing results for variables

Variables	KMO	χ^2	df	P	CMIN	TLI	GFI	CFI	RMSEA
Principals' Instructional Leadership	0,936	1,906	132.000	0,000	251,608	0,965	0,928	0,970	0,047
Teachers' Self-Efficacy	0,905	1,377	51.000	0,000	70.238	0,989	0,971	0,992	0,031
Affective Learning Outcomes	0,912	1,807	34.000	0,000	61.431	0,983	0,970	0,987	0,045

Note. Elaborated by authors (2025).

Descriptive Statistics and Correlation Analysis of Variables

This study conducted descriptive statistical analyses on the three core variables: Principals' Instructional Leadership (PIL), Teachers' Self-Efficacy (TSE), and students' Affective Learning Outcomes (ALO). The analysis focused on key statistical indicators such as mean values, standard deviations, and distribution tendencies, following guidelines proposed by Pallant (2020) and Tabachnick and Fidell (2019).

The descriptive results for PIL revealed that teachers generally held positive perceptions of their principals' instructional leadership. Across the three dimensions—Defining the School Mission, Managing the Instructional Program, and Developing the School Learning Climate—the mean scores were consistently above 3.30, suggesting agreement on the effectiveness of leadership practices. In particular, the dimension of Developing the School Learning Climate received the highest average rating (M = 3.429, SD = 1.151), reflecting the perceived efforts of principals to foster a supportive and collaborative learning environment. These findings align with international literature asserting the pivotal role of instructional leadership in improving school functioning and teacher outcomes (Hallinger, 2011.

Teachers' Self-Efficacy was measured across three subscales: Instructional Strategies, Classroom Management, and Student Engagement. The descriptive statistics indicated moderate levels of perceived self-efficacy, with mean scores slightly above the neutral point (M ≈

3.40; SD = 1.164, 1.200, 1.175), reflecting a general tendency toward agreement. This suggests that teachers held somewhat confident beliefs in their ability to carry out effective teaching practices. These findings are consistent with Bandura (1997) theory, which posits that higher self-efficacy promotes motivation and performance.

The two dimensions of ALO—Closeness and Conflict in teacher–student relationships—were analyzed to assess students' emotional engagement and relational dynamics with their teachers. The Closeness dimension yielded a moderate mean score (M = 3.286, SD = 1.214), indicating that students perceived a fair but not strongly pronounced sense of emotional connection with their teachers. Meanwhile, the Conflict dimension also showed a moderate mean (M = 3.371, SD = 1.155), suggesting that students occasionally experienced interpersonal tension or misunderstandings in the classroom, though not at severe levels. Overall, the results point to a classroom environment characterized by moderate emotional support and occasional relational strain, consistent with the framework proposed by Pianta (2001) and Koomen et al. (2012), which emphasizes the dual impact of closeness and conflict in shaping students' affective learning experiences.

Collectively, the descriptive results indicate that teachers in this vocational college sample perceive their principals' leadership somewhat positively, feel moderately confident in their instructional capabilities, and report teacher–student relationships that are moderately supportive yet not without occasional conflict.The following table 3 is the descriptive statistical analysis.

Table 3
Level of three variables

Variables	Object	Mean	SD
Principals' Instructional Leadership	Defines the School Mission	3,37	1.16
	Manages the Instructional Program	3,39	1.17
	Develops a Positive School Learning Climate	3,429	1,151
Teachers' Self-Efficacy	Efficacy for Instructional Strategies	3,40	1,146
	Efficacy for Classroom management	3,40	1,20
	Efficacy for Student Engagement	3,40	1,175
Affective Learning Outcomes	Closeness	3,286	1,214
	Conflict	3,371	1,155

Note. Elaborated by authors (2025).

Mediating model in structural equation modeling

This study employed Structural Equation Modeling (SEM) to examine the mediating role of teachers' self-efficacy (TSE) in the relationship between principals' instructional leadership (PIL) and students' affective learning outcomes (ALO) in higher vocational colleges. SEM is particularly effective in exploring complex variable relationships and assessing both direct and indirect effects among latent variables (Kline, 2016; Hair et al., 2013).

In this model, PIL is treated as the independent variable and includes three dimensions as proposed by Hallinger (2000): Defining the School Mission (DSM), Managing the Instructional Program (MIP), and Developing the School Learning Climate (DSC). Each dimension is measured by specific survey items (e.g. DSM1, MIP1, DSC1) that reflect teachers' perceptions of principals' instructional leadership, following frameworks proposed by Hallinger (2001).

Teachers' Self-Efficacy (TSE), serving as the mediating variable in this study, comprises three key dimensions: Efficacy for Instructional Strategies (EIS), Efficacy for Classroom Management (ECM), and Efficacy for Student Engagement (ESE). These dimensions are measured through multiple survey items (e.g., EIS1, ECM1, ESE1) adapted from the Teachers' Sense of Efficacy Scale developed by Tschannen-Moran and Hoy (2001). Together, they capture teachers' perceived capability to design effective instruction, maintain orderly classrooms, and foster student participation—core aspects of teacher performance in educational settings. This multidimensional structure reflects established theoretical models of teacher self-efficacy and its central role in influencing both teacher behavior and student outcomes (Bandura, 1997; Tschannen-Moran & Hoy, 2001).

Students' Affective Learning Outcomes (ALO), serving as the dependent variable in this study, comprise two primary dimensions: Closeness (CL) and Conflict (CF) in teacher–student relationships. These dimensions are measured through multiple survey items (e.g., CL1, CF1) adapted from the Student–Teacher Relationship Scale (STRS) developed by Pianta (2001). Closeness (CL) reflects students' perceived warmth, trust, and emotional connection with their teachers, while Conflict (CF) captures the degree of tension, discord, or negative emotional experiences within the teacher–student relationship.

The SEM model used fit indices such as χ^2/df, CFI, TLI, and RMSEA, with acceptable thresholds guided by the recommendations of Hair et al. (2013). The model aligns with prior studies indicating that principals' instructional leadership enhances students' affective learning outcomes through teachers' self-efficacy (Hallinger, 2011; Tschannen-Moran & Hoy, 2001; Leithwood & Jantzi, 2008).

Key paths analyzed in the model include:

- Path a: Principals' Instructional Leadership → Teachers' Self-Efficacy
- Path b: Principals Instructional Leadership → Affective Learning Outcomes
- Path c: Teachers' Self-Efficacy → Affective Learning Outcomes

These paths indicate that principals' instructional leadership may impact students' affective learning outcomes either directly or through an indirect effect mediated by teahers' self-efficacy. These paths indicate that principals' instructional leadership may impact students' affective learning outcomes either directly or through an indirect effect mediated by teachers' self-efficacy. Such mediating effects have been highlighted in prior studies on the role of students' affective learning outcomes in educational settings (Pianta, 2001; Koomen et al., 2012).The detailed path coefficients and fit indices of the model are presented in table 4.The model fit results presented in Table 4 show that key fit indices—χ2/DF, RMSEA, IFI,NFI, TLI, CFI, GFI, and AGFI—meet or approximate the acceptable criteria recommended by Hair et al. (2013), indicating that the structural equation model achieves a satisfactory fit to the data. Table 4 shows the model fit test.

Table 4
Model Fit Test

χ2/ df	RMSEA	CFI	NFI	IFI	TLI	GFI	AGFI
1,291	0,027	0,976	0,902	0,976	0,974	0,895	0,882

Note. Elaborated by authors (2025).

Direct effects of principals' instructional leadership on students' affective learning outcomes

This study investigates the direct influence of principals' instructional leadership (PIL) on students' affective learning outcomes (ALO) within the structural equation modeling (SEM) framework. As presented in Table 5, the standardized path b coefficient for the direct path from PIL to ALO is β = 0.428, with a standard error (S.E.) of 0.131, a critical ratio (C.R.) of 4.161, and a p-value less than 0.001, indicating statistical significance. These results confirm that principals' instructional leadership exerts a significant positive direct effect on students' affective learning outcomes.

Table 5
Direct effects of principals' instructional leadership on affective learning outcomes

	Path	Standard path coefficient	SE	CR	P	Results
Path a	PIL-->TSE	0,687	0,094	7,888	***	support
Path b	PIL-->ALO	0,428	0,131	4.161	***	support
Path c	TSE-->ALO	0,397	0,118	4.002	***	support

Note. Elaborated by authors (2025).

Specifically, a one-unit increase in perceived instructional leadership corresponds to an approximate 0.428-unit increase in students' affective learning outcomes. This suggests that when principals are more engaged in setting instructional goals, supervising teaching practices, and creating a supportive school climate, students tend to report stronger emotional bonds and fewer conflicts in their interactions with teachers.

Mediating effects of teachers' self-efficacy

Teachers' self-efficacy serves as a key mediating variable linking principals' instructional leadership (PIL) and students' affective learning outcomes (ALO). The structural equation modeling results show that the path from PIL to teachers' self-efficacy (TSE) is strong and significant ($\beta = 0.687$, C.R. = 7.888, $p < 0.001$), indicating that principals who provide clear instructional goals, professional support, and feedback effectively enhance teachers' confidence and competence. The path from TSE to ALO is also significant ($\beta = 0.397$, S.E. = 0.118, C.R. = 4.002, $p < 0.001$), suggesting that self-efficacious teachers create emotionally supportive classrooms characterized by higher student–teacher closeness and lower conflict.

Furthermore, the indirect effect of PIL on ALO through TSE is significant ($\beta = 0.273$, 95% CI [0.121, 0.428], $p = 0.001$), confirming the mediating role of teacher self-efficacy. These results, consistent with Bandura's (1997) theory, emphasize that empowering teachers' self-belief is a crucial mechanism through which instructional leadership fosters students' positive emotional and relational outcomes. Table 6 summarizes the mediation analysis results.

Table 6
Mediation Effect Test

Parameter	Estimate	Indirect Effects		
		Lower	Upper	P
PIL-->TSE-->ALO	0,273	0,428	0,121	0,001

Note. Elaborated by authors (2025).

Hypothesis Testing Results, see Table 7:

- H1: Supported-Principals' Instructional leadership positively impacts teachers' self--efficacy (β= 0.687, p< 0.001);
- H2: Supported-Principals' Instructional leadership positively impacts students' affective learning outcomes (β = 0.428, p < 0.01);
- H3: Supported-Teachers' self-efficacy positively impacts students' affective learning outcomes (β = 0.397, p < 0.01);
- H4: Supported-Teachers' self-efficacy mediates the relationship between principals' instructional leadership and students' affective learning outcomes (β = 0.273, p < 0.01).

Table 7
Result of mediation analysis for TSE

Path	Direct Effects	Indirect Effects	Total Effects	Degree of mediation
PIL—>TSE	0,687***	-	0,687***	Partial Mediation
TSE—>ALO	0,397**	-	0,397**	
ALO<-TSE<-PIL	0,428**	0,273**	0,701***	

Note. Elaborated by authors (2025). ***p<0.001, **P<.0.

DISCUSSION

Based on data from 406 valid responses collected from vocational colleges in China, this study provides a comprehensive analysis of how principals' instructional leadership (PIL) affects students' affective learning outcomes (ALO), both directly and indirectly through teachers' self-efficacy (TSE). The findings indicate that PIL significantly enhances students affective outcomes, aligning with existing literature. For instance, Hallinger (2011) emphasized that instructional leadership fosters emotionally supportive classroom climates by promoting instructional quality and relational trust. Similarly, Leithwood and Jantzi (2008)

proposed that school leadership impacts students most effectively through teacher-level mediators such as self-efficacy, which is consistent with the indirect effect found in this study.

The direct path from PIL to ALO confirms that when principals articulate academic goals, supervise instruction, and provide professional support, students report higher levels of closeness and lower levels of conflict in their relationships with teachers. This aligns with Piant (2001) framework on teacher-student relationship quality as a predictor of affective learning.

Furthermore, the results highlight the mediating role of teachers' self-efficacy. PIL significantly predicts TSE, which in turn influences ALO. These findings support Bandura (1997) social cognitive theory, suggesting that confident teachers are more likely to engage students affectively and foster emotionally secure learning environments.

By employing structural equation modeling, this study empirically validates the theoretical proposition that instructional leadership exerts multi-level effects—directly enhancing student experiences and indirectly promoting them through empowered, efficacious teachers.

CONCLUSION

EThis study explores the impact of principals' instructional leadership on teachers' self-efficacy and students' affective learning outcomes within vocational colleges in China. Drawing on data from 406 valid teacher-student dyads, the findings confirm that instructional leadership—characterized by clearly defined academic goals, active instructional supervision, and professional support—positively influences both teacher confidence and students' emotional engagement. These results align with the work of Hallinger (2011), who emphasized the role of instructional leadership in fostering teacher development and improving classroom climates, and Bandura (1997), who highlighted the importance of self--efficacy in motivating professional behavior and performance.

The research further reveals that instructional leadership not only has a direct effect on students' affective learning outcomes but also an indirect one mediated by teachers' self-efficacy. Teachers who perceive strong leadership support report higher self-efficacy, which in turn enhances the quality of teacher–student emotional relationships—marked by greater closeness and reduced conflict (Pianta, 2001; Tschannen-Moran & Hoy, 2001). These findings resonate with Leithwood and Jantzi's (2008) leadership framework, which posits that leadership most effectively shapes student outcomes through teacher-level variables. Moreover, recent studies substantiate these mechanisms: Chen and Rong (2023) multilevel

analysis in China shows that teacher collaboration and perceived principal support significantly boost self-efficacy and promote positive student engagement. Additionally, a 2024 meta-analytic review found consistent indirect effects of instructional leadership on student outcomes via teacher performance and efficacy, aligning closely with our mediation findings (Papadakis et al., 2024).

Additionally, structural equation modeling (SEM) confirmed the mediating role of teachers' self-efficacy in the relationship between principals' instructional leadership and students' affective learning outcomes. This mediation pathway highlights that leadership impacts student experiences not only through direct mechanisms but also by empowering teachers to cultivate affective, student-centered classrooms.

In summary, this study affirms that principals' instructional leadership is a pivotal factor in shaping both teacher professionalism and student affective development. The results provide actionable insights for school leaders and policymakers, advocating for leadership practices that emphasize professional trust, instructional alignment, and emotional support. Embracing such leadership approaches can ultimately foster empowered teachers and emotionally connected students, contributing positively to the quality of vocational education in China and beyond.

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