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The Structural Relationships Among Instructional Leadership, Distributed Leadership, Teacher Self-Efficacy, Teacher Collaboration, and Teaching Practices

Chuan-Chung Hsieh
National Tsing Hua University
Anh Hoang Khau
anhkhau@tvu.edu.vn
Tra Vinh University
Romi Aswandi Sinaga
National Tsing Hua University

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Abstract

Drawing on social cognitive theory and social capital theory, this study examined the influence of instructional leadership (IL) and distributed leadership (DL) on optimising teaching practices (TP), with teacher self-efficacy (TSE) as a mediator and teachers' collaboration (TCOL) as a moderator. Data from Vietnam's TALIS 2024 were analysed using partial least squares structural equation modeling (PLS-SEM). The findings indicated that both IL and DL significantly affected all dimensions of TP. Specifically, IL exerted the strongest influence on clarity of instruction, while DL had the greatest impact on cognitive activation. TSE mediated all relationships, whereas TCOL moderated only the relationship between TSE and cognitive activation. These results underscore the importance of school leaders in supporting TP and promoting teacher development and TCOL. The study also offers practical recommendations for policymakers and school leaders to implement leadership development programs, teacher professional development initiatives, and structured collaborations to enhance TP in schools.

Introduction

Recent research has focused on identifying the most effective teaching practices for enhancing student learning and on strategies for promoting these practices through professional development and policy reforms (Fischer et al., 2020). Teaching practice (TP) is defined as a collection of strategies and approaches used to facilitate students' acquisition of knowledge, skills, values, beliefs, and habits (Khader, 2012). The Organization for Economic Co-operation and Development (OECD, 2017) further asserts that teachers must demonstrate expertise in subject-specific pedagogical competence, which involves understanding and applying appropriate teaching methods for subjects and adapting strategies to meet students' diverse needs. Additionally, general pedagogical knowledge is essential for optimizing teaching and supporting students' academic achievement.

Teachers tend to be satisfied with their academic work once their professional identity is recognized (Richter et al., 2021), and this satisfaction helps them develop effective instructional practices that foster students' autonomy, self-regulation, and motivation, extending beyond the classroom (Black & Wiliam, 2018). Instructional quality shapes students' motivational beliefs and perceptions of success, leading to better engagement and academic progress (Burić & Kim, 2020). Consequently, on a larger scale, helping teachers develop their teaching practice is a means of building an educational asset for a country, since improved educational quality can improve people's lives and national development (United Nations, 2019).

Vietnam's educational system was significantly hindered by the First (French) and Second (American) Indochina wars, as well as the Sino-American embargo (London & Duong, 2023). Substantial reforms began in 1986 with the Đổi Mới "Renovation," which marked a transition from a centrally planned economy to a socialist-oriented market economy and initiated international integration (Ho, 2024). In response, Vietnam restructured its education system to better align with market demands, aiming to cultivate a more skilled workforce (Ho, 2024; Hong Thanh, 2011).

In 2013, Vietnam implemented Resolution 29, a significant education reform that prioritized educational development within the national socioeconomic strategy (Le et al., 2022). Subsequently, the Ministry of Education and Training (MOET) introduced Circular No. 20/2018/TT-BGDDT, which redefined teacher standards, and Circular No. 32/2018/TT-BGDĐT, which established a competency-based general education curriculum. Circular 32 advocates for a shift from knowledge transmission to fostering a broad range of student skills and qualities (National Assembly of Vietnam, 2014). It also grants schools greater autonomy to innovate, providing guidelines for student competencies, curriculum content, instructional methods, and assessment. According to the OECD (2025), over 70% of teachers believe they can influence educational policies.

However, analysis of Vietnam's TALIS 2018 dataset by Author et al. (2025b) revealed that neither instructional leadership (IL) nor distributed leadership (DL) was associated with teaching practices, despite these being central constructs in the TALIS surveys (OECD, 2019; OECD, 2024). This finding underscores the need to further investigate the effectiveness of these leadership styles in the Vietnamese context. DL involves delegating leadership responsibilities across staff to encourage collective decision-making and reduce reliance on a single leader, typically the principal (Harris & Jones, 2022). In contrast, IL refers to principals' active efforts to improve teaching quality and student achievement (Ng, 2023).

Previous TALIS cycles did not include items assessing teachers' perceptions of IL within their schools. TALIS 2024 addressed this limitation by incorporating relevant questions into the teacher questionnaire, enabling more accurate assessment of IL. Scholars have conceptualized teaching practices using the TALIS 2018 dataset in various ways. For instance, Chen et al. (2020) identified three dimensions: clarity of instruction, cognitive activation, and classroom management. Xie et al. (2023) included classroom assessment as a distinct dimension alongside clarity of instruction and cognitive activation. Some researchers have treated teaching practices as an integrated construct encompassing these dimensions (e.g., Altun et al., 2025; Author et al., 2025b), while others have examined each dimension separately (e.g., Chen et al., 2020). This study synthesizes these perspectives and investigates teaching practice independently across four dimensions, as defined in the TALIS 2024 dataset: clarity of instruction, cognitive activation, classroom management, and classroom assessment.

This research also investigates whether teacher self-efficacy (TSE) mediates the relationship between IL, DL, and teaching practice. TSE refers to teachers' belief in their capacity to enhance student learning outcomes (Tschannen-Moran & Hoy, 2001). Prior studies have identified a relationship between DL and TSE (e.g., Choi, 2023; Sun & Xia, 2018), although this association was not found in Chinese schools (Zheng et al., 2019). Similarly, while some research has reported a link between IL and TSE (e.g., Cansoy & Parlar, 2018; Liu & Hallinger, 2018), this relationship was either absent or demonstrated only a minimal effect (Alanoglu, 2022).

Additionally, this study examines the moderating role of teacher collaboration (TCOL) in the relationships among DL, IL, and TP, particularly within the context of Confucian culture, which emphasizes social

power distance and collectivism (Truong et al., 2017). TCOL involves teachers working collaboratively with colleagues to exchange ideas, share resources, and coordinate effective TP (OECD, 2019). Evidence from Taiwan indicates that DL and IL are related to TCOL (Author et al., 2024). In the United States, Park et al. (2025) found that TCOL both mediates and moderates the relationship between self-efficacy and instructional clarity. However, findings are inconsistent; for example, Chen et al. (2025) found no association between TSE and TCOL in Taiwan.

Given the inconsistency of previous findings, this research aims to contribute to the literature by providing nuanced insights into these relationships using Vietnam's TALIS 2024 dataset. The study offers a context-specific perspective that facilitates comparison with other educational systems globally. To achieve its objectives, the study addresses the following research questions: (1) To what extent do IL and DL directly influence classroom management, clarity of instruction, cognitive activation, and classroom assessment? (2) To what extent does TSE mediate the relationships between IL, DL, and each dimension of teaching practice? (3) To what extent does TCOL moderate these relationships?

Literature review

Previous research has insufficiently addressed Vietnam's distinctive cultural and educational context (Author et al., 2025b). The present study addresses this gap by investigating the unique characteristics of leadership within Vietnam's cultural and school structures. Specifically, it examines the effects of IL and DL on TES, TCOL, and TP, thereby providing empirical evidence to inform educational leadership and policy reforms in Vietnam.

Conceptual framework

Effective collaboration between schools and teachers is essential for improving TP (Nguyen, 2021). This study examines the interaction between Social Cognitive Theory and Social Capital Theory in enhancing teaching. IL is a leadership approach intended to directly and positively influence teaching practices and student learning outcomes (Gumus et al., 2018). Hallinger and Murphy (1985) developed the Principal Instructional Management Rating Scale (PIMRS) to evaluate principals' IL behaviors in three domains: defining the school's mission, supervising the instructional program, and promoting the school climate. In 2015, Hallinger et al. revised PIMRS to improve its validity across diverse cultural and educational contexts. Since then, this scale has been widely adopted in research (Wang et al., 2025).

School leadership is central to improving school performance (Robinson & Gray, 2019). Leaders who prioritize inclusive education must recognize staff diversity, ensure equitable working conditions, and shape school culture by distributing resources to support a collective vision and mission that includes students' social development (OECD, 2024). Leadership is a defining characteristic of effective schools, fostering and facilitating high-quality teaching and learning (Sun & Xie, 2018). Principals increasingly focus on preparing teachers to deliver impactful instruction and assessments that develop competent and responsible graduates (Oyekan, 2018). Additionally, principals should recognize the necessity of

differentiated instruction to address students' diverse learning needs (Smale-Jacobse et al., 2019). Quality instruction requires teachers to demonstrate proficiency in classroom and time management, including maintaining an organized environment, managing disruptions, and ensuring effective use of instructional time (Van Tartwijk & Hammerness, 2011). Effective teaching also involves setting clear learning goals, organizing and reviewing lesson sequences, providing explicit explanations and examples, and making connections between topics (Titsworth et al., 2015). Furthermore, teachers should activate students' knowledge by employing challenging tasks and questions, activating prior knowledge, exploring students' thinking, co-constructing learning, and supporting metacognition (Praetorius & Charalambous, 2018). Finally, teachers must utilize various assessment methods, including summative and formative assessments (Stiggins & DuFour, 2009), to evaluate student learning and provide timely feedback that guides students' next steps (Hattie & Timperley, 2007).

TSE is recognized as a strong predictor of teaching practices (Altun et al., 2025), prompting principals to prioritize its development (Liu et al., 2023; Sun & Xia, 2018). According to Bandura's (1997) Social Cognitive Theory, self-efficacy is shaped by observational learning, which involves acquiring new behaviors and knowledge through observing others. Self-efficacy is also influenced by reciprocal determinism, which describes the dynamic interaction among personal factors such as cognition and emotions, environmental influences, and the effects of reinforcements and punishments. Teachers with high self-efficacy believe they can influence their own teaching behaviors and practices (Tschannen-Moran & Hoy, 2001).

Collaboration among teachers enhances professional performance (Nguyen, 2021). This collaborative perspective is grounded in Social Capital Theory (Bourdieu, 1986), which emphasizes the importance of networks of relationships among individuals within society, which enable effective societal functioning. Donohoo (2016) observed that staff collaboration for the benefit of students can increase student achievement. Therefore, fostering a culture of collaboration is essential for school leaders seeking to improve teaching quality (Datnow & Park, 2018). Such cultures enable teachers to build self-efficacy and collective efficacy through shared beliefs and collaborative efforts (Goddard et al., 2004). Farooq and Bashir (2025) found that collaboration strengthens the relationship between knowledge sharing and team effectiveness. Based on these perspectives, this study proposes a framework (see Fig. 1) in which DL and IL directly and positively impact TP across four dimensions and indirectly affect these dimensions through TSE. Additionally, TCO is expected to strengthen the relationship between TSE and these four dimensions.

Development of Hypotheses

Relationship between IL, DL and teaching practices

Previous research has established a connection between IL and TP (e.g., Bellibaş et al., 2022; Dorukbaş[illegible]ı & Cansoy, 2024; Nguyen et al., 2018). Principals who demonstrate IL typically articulate their schools' missions clearly and closely supervise instructional programs. Furthermore, these principals recognize

the significance of school climate in achieving institutional goals (Hallinger et al., 2015; Hallinger & Murphy, 1985). Consistent with this perspective, Altun et al. (2025) contend that IL is effective because it clarifies instructional priorities, aligns teachers' efforts with curriculum objectives, and reinforces instructional norms. Cognitive activation involves intellectually demanding tasks, higher-order questioning, and problem-solving activities (Fischer et al., 2020), and this practice can be better enhanced when leaders emphasize curriculum rigor, instructional improvement, and teacher professional development. IL practices, such as defining instructional goals, coordinating curriculum, and supervising teaching (Hallinger & Murphy, 1985), are expected to have a pronounced impact on instructional clarity (Liu & Hallinger, 2018). Meta-analytic evidence further identifies instructional clarity as a distinct and influential aspect of teaching quality (Titsworth et al., 2015). IL is also anticipated to strengthen teachers' classroom management, a key component of general pedagogical knowledge (GPK) (OECD, 2024). Effective classroom management relies on established instructional routines, maximizing time-on-task, and maintaining consistent expectations for teaching and learning. Instructional leaders support this dimension by monitoring instructional time, reinforcing norms, and fostering orderly learning environments (Hallinger & Murphy, 1985). Foundational assessment research indicates that effective classroom assessment is integrated within instructional supervision and reflective teaching, both central to IL (Black & Wiliam, 2018). School leaders practicing IL are expected to engage teachers in discussions about student assessment, as classroom assessment clarifies connections among content areas through both formative and summative measures and the sequencing of learning tasks (Titsworth et al., 2015). Nevertheless, some studies have reported that IL is ineffective in certain contexts, such as Vietnamese primary schools (Bellibaş et al., 2022), Mainland China secondary schools (Wang et al., 2025), and Taiwanese secondary schools (Author et al., 2025b; Author et al., 2025c). The underlying causes may derive from bureaucratic norm that hinders principals' focus on IL (Rodrigues & Ávila de Lima, 2024). Additionally, the term "instructional leader" is sometimes employed as a rhetorical label rather than a well-defined set of leadership practices, which can result in vague guidance for leaders (Leithwood et al., 2020). While prior research has often conceptualized teaching practices as a latent variable, the present study examines the construct through four dimensions to provide a comprehensive analysis of teaching practices under IL. Based on these considerations, the following hypotheses are proposed.

H1a. IL is positively associated with instructional clarity.

H1b. IL is positively associated with cognitive activation.

H1c. IL is positively associated with classroom management.

H1d. IL is positively associated with classroom assessment.

Previous studies have identified an association between DL and TP (e.g., Lin, 2022; O'Shea, 2021). However, the impact of DL on teaching practices requires further investigation across diverse contexts, as some research has not found a significant relationship (e.g., Bellibaş et al., 2022; Author et al., 2025b). Auhentic DL is realized only when teachers are genuinely provided with leadership opportunities,

rather than when leadership is merely declared as shared (Printy & Liu, 2021). DL is acknowledged for expanding school leadership beyond the actions of principals alone (Lin, 2022). When teachers are granted decision-making authority, they are more likely to implement instructional strategies that prepare students with future-oriented skills (O'Shea, 2021). Effective school leadership is characterized by robust support for teaching, transparent communication, and the positive influence of principals' DL in fostering organizational culture and individual innovation (Daniëls et al., 2019). Prior research has also established a link between DL and cognitive activation (O'Shea, 2021). Cognitive activation represents an innovative teaching strategy aimed at developing students' higher-order cognitive skills (Le Donné et al., 2016). Since cognitive activation is used to capture classroom innovation and to emphasize the development of students' cross-curricular skills, principals can enable teachers to maximize its use (O'Shea, 2021). Cognitively demanding instruction necessitates professional judgment, innovation, and a willingness to experiment; these conditions are supported by shared leadership and teacher agency (Spillane, 2006). In summary, DL is regarded as a positive leadership style and is therefore expected to enhance teaching practices. Based on these considerations, the study proposes the following hypotheses.

H2a. DL is positively associated with instructional clarity.

*H2b. D*L is positively associated with cognitive activation.

H2c. DL is positively associated with classroom management.

*H2d. D*L is positively associated with classroom assessment.

TSE as potential mediator of the relationships between IL, DL and TIP

Liu et al. (2021) found that both DL and IL are positively associated with TSE. The positive relationship between IL and TSE was also identified by Çoban et al. (2023) and Liu et al. (2021). Alanoglu (2022) reported that IL practices foster a supportive school environment. Fackler and Malmberg (2016) demonstrated that principal support significantly improves TSE, particularly among teachers of lower-achieving students. Coldren and Spillane (2007) argued that principals influence teachers' instructional practices through classroom observation, feedback, and the provision of professional learning opportunities. Leadership practices such as observing instruction and providing feedback contribute to measurable improvements in teaching (Hallinger, 2003). Similarly, Sun and Xia (2018) found a positive association between DL and TSE. This association may be explained by the increased agency teachers experience when involved in decision-making, which enables them to address areas of lower competence and enhance their self-efficacy (Spillane et al., 2015). Choi (2023) emphasized that promoting teacher participation in school improvement and collaborative feedback is essential for strengthening TSE. Based on these findings, the present study proposes the following hypotheses.

Previous research has established an association between TSE and TP (e.g., Altun et al., 2025; Xie et al., 2023). Altun et al. (2025) identified TSE as the most significant predictor of TP. Chen et al. (2020) demonstrated that instructional efficacy is a stronger predictor of instructional clarity, while classroom management efficacy has a greater influence on classroom management practices. For cognitive activation, instructional efficacy is positively associated, whereas classroom management efficacy is negatively associated. Analysis of TALIS data from China and England by Xie et al. (2023) indicated that TSE is a significant positive predictor of clarity of instruction, cognitive activation, and classroom assessment.

TSE is grounded in Social Cognitive Theory (Bandura, 1997) and teacher efficacy research (Tschannen-Moran & Hoy, 2001), which suggests that stronger efficacy beliefs enhance teachers' confidence, persistence, and capacity to implement effective TP. Teachers with high TSE invest greater effort and demonstrate increased persistence (Bandura, 1997; Burić & Kim, 2020). Such teachers are more likely to adopt cognitively demanding and student-centered strategies (Chen et al., 2020). Classroom management efficacy establishes the conditions necessary for effective instruction (Chen et al., 2020; Van Tartwijk & Hammerness, 2011). As explained by Bandura (1997), TSE is treated as a psychological resource for teachers to improve student learning, and several empirical studies have explored it. For example, many studies using TALIS data have found that IL and DL influence TP indirectly via TSE (e.g., Çoban et al., 2023; Sun & Xia, 2018; Liu et al., 2021; Long & Xia, 2025). Based on these perspectives, the present study proposes the following hypotheses:

H3a. TSE mediates the effect of IL on instructional clarity.

H3b. TSE mediates the effect of IL on cognitive activation.

H3c. TSE mediates the effect of IL on classroom management.

H3d. TSE mediates the effect of IL on classroom assessment.

H4a. TSE mediates the effect of DL on instructional clarity.

H4b. TSE mediates the effect of DL on cognitive activation.

H4c. TSE mediates the effect of DL on classroom management.

H4d. TSE mediates the effect of DL on classroom assessment.

Interaction of TCOL with TSE and teaching practices

Altun et al. (2025) identified that TCOL explains TP. Bellibaş et al. 2022 found TCOL is related to teaching practices. TCOL involves individuals coming together, committing to the sharing of expertise and thinking, planning, deciding and acting based on a shared understanding of each other and the communities people operate in. In terms of TCOL, teachers have designed curriculum together,

moderated each other's assessments, undertaken action research and become involved in educational networks of teachers or schools (Hargreaves & O'Connor, 2017). Chong and Kong (2012) examined how lesson study—a collaborative approach emphasizing inquiry, knowledge sharing, and joint material development—enhances TSE. Lesson study has a positive effect on TSE (Çoban et al., 2023). Hence, their beliefs are more likely to translate into instructional behavior in collaborative school environments (Fackler & Malmberg, 2016). Ultimately, TCOL will be expected to strengthen the relationship of TSE and TP across the four dimensions. Farooq and Bashir (2025) also found the moderating effect of collaboration in their study. Hence, the study proposes the following hypotheses:

H5a. TCOL moderates the effect of TSE on instructional clarity.

H5b. TCOL moderates the effect of TSE on cognitive activation.

H5c. TCOL moderates the effect of TSE on classroom management.

H5d. TCOL moderates the effect of TSE on classroom assessment.

Method

Data source

This study utilized secondary data from the OECD's Teaching and Learning International Survey (TALIS) 2024. As an international large-scale assessment, TALIS facilitates the collection of educators' perspectives on educational development and teaching practices. The dataset includes validated measures of key constructs relevant to this research. Final teacher weights were applied to account for the sampling design, and missing data were addressed using the Expectation-Maximization (EM) method.

In the context of Vietnam, teacher data reflect educators' perceptions of curriculum development and instructional practices. A total of 4,348 valid teacher responses were analyzed. Specifically, 6.3% of respondents were aged 29 years or younger, 26.6% were aged 30 to 39 years, 53.8% were aged 40 to 49 years, and 13.3% were aged 50 years or older. Regarding educational attainment, 5.0% held less than a short-cycle tertiary qualification, 4.4% possessed a short-cycle tertiary qualification, 90.8% held a bachelor's degree, and 4.3% held a master's degree. In terms of teaching experience, 26.0% had five years or less, 19.7% had six to ten years, 35.0% had eleven to twenty years, and 19.3% had more than twenty years of teaching experience.

Variables

The IL construct comprises five items that assess teachers' perceptions of their principal's leadership at school, based on frameworks established in prior empirical studies (e.g., Bellibaş et al., 2022; Author et

al., 2024). Each item is rated on a four-point Likert scale, ranging from strong disagreement to strong agreement. A sample item is: “The principal has a clear vision for this school.”

The DL construct includes three items that assess teachers’ perceptions of the extent to which leadership is distributed among various stakeholders in their schools, following established constructs from previous empirical studies (e.g., Bellibaş et al., 2022; Author et al., 2024). Each item is rated on a four-point Likert scale, ranging from strong disagreement to strong agreement. A sample item is: “This school provides staff with opportunities to actively participate in school decisions.”

The TP construct comprises 16 items designed to assess teachers’ perceptions of their classroom teaching practices, drawing upon frameworks established in prior empirical studies (e.g., Chen et al., 2020; Author et al., 2025a; Xie et al., 2023). TP is organized into four domains: clarity of instruction, cognitive activation, classroom management, and classroom assessment. Each item is rated on a four-point Likert scale, ranging from never or almost never to always. Representative items include clarity of instruction: “I present a summary of recently learned content.”; cognitive activation: “I present tasks for which there is no obvious solution”; classroom management: “I tell students to follow classroom rules.”; and classroom assessment: “I administer an assessment at the end of a unit or block of lessons.”

The TSE construct comprises 12 items that assess teachers’ perceptions of their self-efficacy, following frameworks established in previous empirical studies (Sun and Xia, 2018; Author et al., 2025b). Each item is rated on a four-point Likert scale, ranging from not at all to a lot. A sample item is: “Get students to believe they can do well in schoolwork.”

The TCOL construct consists of eight items within two domains: exchange and coordination among teachers, and professional collaboration in lessons, based on prior empirical studies (e.g., Wang et al., 2025). Each item is rated on a six-point Likert scale, ranging from never to once a week or more. Two items with factor loadings below 0.6 were excluded. A sample item is: “Engage in joint activities across different classes and age groups (e.g. projects).”

Analytical strategy

Partial least squares structural equation modeling (PLS-SEM) provides significant advantages in social studies research, particularly for analyzing complex models and secondary data where theoretical frameworks are not well established (Hair et al., 2019). Secondary data are primarily utilized for exploratory research aimed at identifying causal relationships (Hair et al., 2017). Although social studies often involve non-normal data, this characteristic alone does not justify the use of PLS-SEM (Nitzl, 2016). In this study, PLS-SEM is deemed to be appropriate due to its capacity to support a predictive orientation, accommodate a complex mediated moderation model, and address the non-normal distribution of the TALIS data.

More specifically, the study employed two stages of the analysis procedures. In the first stage, the measurement model was evaluated to assess the validity and reliability of all variables. Every item with outer loadings higher than 0.60 was retained, while internal consistency was assessed using Cronbach's alpha ($\alpha > 0.70$) and composite reliability (CR > 0.70). Convergent validity was examined by assessing average variance extracted (AVE > 0.50), and discriminant validity was assessed using the heterotrait–monotrait ratio of correlations (HTMT < 0.85) (Hair et al., 2021). In addition, predictive relationships (R^2 and Q^2) were examined to assess the power and relevance of the prediction model (Chin, 1998). R^2 reflects the proportion of variance explained by endogenous variables (R^2 = 0.67, 0.33, and 0.19 indicating substantial, moderate, and weak explanatory power, respectively). Q^2 reflects predictive relevance (Q^2>0.35, > 0.15, and > 0.02 indicate large, medium, and small predictive relevance, respectively). The variance inflation factor (VIF) was also examined to assess multicollinearity; values below 5 were considered acceptable. In the second stage, hypothesis testing assessed the strength and direction of relationships, evaluated using path coefficients (β), *t*-values, and confident interval (CI), with statistical significance determined via bootstrapping ($p < 0.05$). All analyses were conducted using SmartPLS 4.0, a software package for variance-based structural equation modeling used with secondary data (Ringle et al., 2024).

Results

Measurement model assessment

Table 1 shows that the outer loading values exceeded the threshold of 0.60, and all constructs satisfied the reliability and validity criteria ($\alpha \geq 0.77$; CR ≥ 0.85; AVE ≥ 0.50; HTMT ≤ 0.70). These results demonstrate that the measurement model possesses satisfactory psychometric properties. Furthermore, the R^2 and Q^2 values for clarity of instruction (0.31; 0.20), classroom assessment (0.17; 0.09), classroom management (0.17; 0.10), cognitive activation (0.29; 0.17), and TSE (0.12; 0.06) indicate that clarity of instruction and cognitive activation have weak explanatory power and medium predictive relevance. In contrast, classroom assessment, classroom management, and TSE exhibit very low explanatory power and small predictive relevance. Finally, the VIF values for all relationships (VIF ≤ 1.47) confirm the absence of multicollinearity issues.

Table 1

Results of the Measurement Model Assessment

Constructs	α	CR	AVE	HTMT						
				1	2	3	4	5	6	7
1. IL	0.94	0.95	0.82							
2. DL	0.80	0.88	0.72	0.58						
3. CIN	0.82	0.88	0.65	0.39	0.34					
4. CAC	0.78	0.86	0.60	0.33	0.41	0.70				
5. CMA	0.77	0.85	0.59	0.30	0.26	0.61	0.52			
6. CAS	0.83	0.87	0.54	0.30	0.30	0.60	0.60	0.50		
7. TSE	0.91	0.92	0.50	0.35	0.29	0.58	0.54	0.45	0.39	
8. TCOL	0.81	0.86	0.51	0.20	0.23	0.33	0.41	0.16	0.30	0.39

Note. IL = Instructional leadership; DL = Distributed leadership; CIN = Clarity of instruction; CAC Cognitive Activation; CMA = Classroom management; CAS = Classroom assessment; TSE = Teacher self-efficacy; TCOL = Teacher collaboration.

Hypothesis testing

Table 2 demonstrates that IL had the most pronounced direct effect on clarity of instruction ($\beta = 0.15$, $p < 0.001$), followed by classroom management ($\beta = 0.13$, $p < 0.001$), classroom assessment ($\beta = 0.11$, $p < 0.001$), and cognitive activation ($\beta = 0.05$, $p < 0.01$). Conversely, DL exhibited the strongest direct effect on cognitive activation ($\beta = 0.18$, $p < 0.001$), followed by classroom management ($\beta = 0.06$, $p < 0.01$), clarity of instruction ($\beta = 0.09$, $p < 0.001$), and classroom assessment ($\beta = 0.11$, $p < 0.001$).

Table 2
Direct Effect Estimates

H	Paths	*β*	*t*	95% CI	Results
H1a	IL → CIN	0.15***	10.24	[0.12; 0.18]	Supported
H1b	IL → CAC	0.05**	3.42	[0.02; 0.08]	Supported
H1c	IL → CMA	0.13***	8.01	[0.10; 0.16]	Supported
H1d	IL → CAS	0.11***	6.43	[0.07; 0.14]	Supported
H2a	DL → CIN	0.09***	5.06	[0.05; 0.12]	Supported
H2b	DL → CAC	0.18***	10.64	[0.14; 0.21]	Supported
H2c	DL → CMA	0.06**	3.23	[0.02; 0.10]	Supported
H2d	DL → CAS	0.11***	6.17	[0.08; 0.15]	Supported

Note. $^{**}p < 0.01$; $^{***}p < 0.001$; IL = Instructional leadership; DL = Distributed leadership; CIN = Clarity of instruction; CAC = Cognitive Activation; CMA = Classroom management; CAS = Classroom assessment; TSE = Teacher self-efficacy.

Table 3 presents the mediating effects results. TSE was found to mediate the relationships between IL and clarity of instruction partially ($\beta = 0.11$, $p < 0.001$), cognitive activation ($\beta = 0.09$, $p < 0.001$), classroom management ($\beta = 0.09$, $p < 0.001$), and classroom assessment ($\beta = 0.06$, $p < 0.001$). Similarly, TSE partially mediated the relationships between DL and clarity of instruction ($\beta = 0.05$, $p < 0.001$), cognitive activation ($\beta = 0.04$, $p < 0.001$), classroom management ($\beta = 0.04$, $p < 0.001$), and classroom assessment ($\beta = 0.03$, $p < 0.001$). Overall, these findings suggest that the mediating role of TSE was stronger in the effects of IL on teaching practices than in those of DL.

Table 3
Mediating Effect Estimates

H	Paths	*β*	*t*	95% CI	Results
H3a	IL → TSE → CIN	0.11***	14.49	[0.09; 0.12]	Supported
H3b	IL → TSE → CAC	0.09***	13.78	[0.08; 0.11]	Supported
H3c	IL → TSE → CMA	0.09***	13.21	[0.08; 0.10]	Supported
H3d	IL → TSE → CAS	0.06***	11.15	[0.05; 0.08]	Supported
H4a	DL → TSE → CIN	0.05***	6.91	[0.04; 0.06]	Supported
H4b	DL → TSE → CAC	0.04***	6.92	[0.03; 0.05]	Supported
H4c	DL → TSE → CMA	0.04***	6.73	[0.03; 0.05]	Supported
H4d	DL → TSE → CAS	0.03***	6.52	[0.02; 0.04]	Supported

Note. *$p < 0.05$; ***$p < 0.001$; IL = Instructional leadership; DL = Distributed leadership; CIN = Clarity of instruction; CAC = Cognitive Activation; CMA = Classroom management; CAS = Classroom assessment; TSE = Teacher self-efficacy.

Table 4 presents the results of the moderating effect analysis. TCOL significantly moderated the mediating effect of TSE on cognitive activation ($\beta = 0.03$, $p < 0.05$). However, TCOL did not significantly moderate the mediating effects of TSE on clarity of instruction ($\beta = 0.01$, $p > 0.05$), classroom management ($\beta = 0.01$, $p > 0.05$), or classroom assessment ($\beta = -0.01$, $p > 0.05$). These results indicate that the positive effect of TSE on cognitive activation is enhanced at higher levels of TCOL. In contrast, TCOL does not strengthen the effects of TSE on clarity of instruction, classroom management, or classroom assessment, suggesting that collaboration primarily facilitates teachers' cognitive engagement rather than other instructional domains.

Table 4
Moderating Effect Estimates

H	Paths	*β*	*t*	95% CI	Results
H5a	TCOL X TSE → CIN	0.01	0.32	[-0.02; 0.03]	Unsupported
H5b	TCOL X TSE → CAC	0.03*	2.10	[0.01; 0.05]	Supported
H5c	TCOL X TSE → CMA	0.01	0.61	[-0.02; 0.03]	Unsupported
H5d	TCOL X TSE→ CAS	-0.01	0.47	[-0.04; 0.02]	Unsupported

Note. *p < 0.05; CIN = Clarity of instruction; CAC = Cognitive Activation; CMA = Classroom management; CAS = Classroom assessment; TSE = Teacher self-efficacy; TCOL = Teacher collaboration.

The moderation analysis indicated that the positive effect of TSE on cognitive activation was most pronounced at higher levels of TCOL; black line), compared to the mean (dark gray line) and lower levels

(light gray line). These findings suggest that teacher collaboration amplifies the influence of TSE on cognitively activating instructional practices (see Fig. 2).

Discussion

This study extends existing research by offering a context-sensitive perspective on the interaction between two leadership styles, TSE and TP, in a Confucian-influenced, centralized educational system such as Vietnam. Unlike some previous studies (e.g., Author et al., 2025b), which found no associations between DL or IL and TP in Vietnamese schools, this study shows the opposite. Hence, the present study provides empirical evidence that both IL and DL influence TP directly and indirectly through TSE, which serves as an important mediator in these relationships.

The effect of IL on TP

Though, as identified in TALIS 2018 by Author et al. (2025b), IL was not associated with TP in Vietnamese primary schools, the present findings show that IL has a significant positive impact on TP across all four dimensions. The result is aligned with previous studies' findings of a positive association between IL and TP (Bellibaş et al., 2022; Dorukbaş□ı & Cansoy, 2024). In this context, IL exerts its strongest influence on instruction clarity, followed by classroom management, classroom assessment, and cognitive activation. This distribution reflects the core principles of IL, which emphasize goal alignment, instructional supervision, and the setting of pedagogical expectations (Hallinger et al., 2015; Hallinger & Murphy, 1985). By articulating instructional goals, monitoring teaching quality, and providing feedback, principals who employ IL foster structured instructional environments that support teachers' lesson organization and students' cognitive activation for lesson mastery (Altun et al., 2025). The smaller effect of IL on cognitive activation is consistent with the concept that cognitively demanding instruction requires risk-taking in learning (Fischer et al., 2020). Accordingly, fostering higher levels of cognitive activation may require both instructional guidance and confidence in their classroom capabilities (Liu & Hallinger, 2018).

In highly centralized and hierarchical systems such as Vietnam, IL may be more effective at reinforcing standardized, routine instructional practices than at encouraging innovative and inquiry-based teaching (Bellibaş et al., 2022; Author et al., 2025b; Nguyen et al., 2018; Wang et al., 2025).

The effect of DL on TP

Although Author et al. (2025b) found that DL was not associated with TP in Vietnamese primary schools in TALIS 2018, the study overall found a positive relationship between DL and TP in these Vietnamese secondary schools, corroborating previous research (Lin, 2022; O'Shea, 2021). DL exerts its greatest influence on cognitive activation, followed by classroom assessment, instruction clarity, and classroom management. These results highlight that shared leadership fosters teachers' use of intellectually challenging instruction, which encourages students to critically think of their answers and reasoning in problem-solving, and engage in learning (O'Shea, 2021). Cognitive activation inherently promotes

innovation and learning through questioning, which is more likely to occur in classrooms where leadership responsibilities are shared and teachers have autonomy in instructional decision-making (Spillane, 2006). When leadership is distributed through either formal or informal channels, principals allow teachers to exchange ideas, experiment with instructional strategies, and co-construct knowledge, thereby encouraging cognitively activating practices (Daniëls et al., 2019; Lin, 2022).

The mediating effect of TSE

The study demonstrates a positive association between both DL and IL with TSE, consistent with prior research (Liu et al., 2021). Specifically, the positive relationship between IL and TSE aligns with findings from Alanoglu (2022), Çoban et al. (2023), and Liu et al. (2021), while the association between DL and TSE is supported by Choi (2023) and Sun and Xia (2018).

Both IL and DL are effective leadership styles for promoting TSE, with IL exerting its stronger influence than that driven from DL. IL enhances TSE by enabling school leaders to establish clear expectations, provide feedback, and offer professional support, thereby strengthening teachers' confidence in their classroom abilities (Çoban et al., 2023; Liu et al., 2021). Through supervision, mentoring, and professional development, instructional leaders reinforce teachers' beliefs in their capacity to manage classrooms, deliver clear instruction, assess student learning, and engage students cognitively (Hallinger, 2003; Fackler & Malmberg, 2016). DL contributes to TSE by fostering teachers' sense of agency, professional recognition, and participation in school decision-making (Spillane et al., 2015; Sun & Xia, 2018). When teachers perceive themselves as active contributors rather than passive implementers, their confidence in addressing diverse instructional challenges increases (Choi, 2023).

TSE is essential for maintaining effective classroom management, implementing diverse assessment strategies, and engaging students in cognitively demanding activities (Altun et al., 2025; Xie et al., 2023). These results emphasize the central role of psychological processes in translating leadership influences into classroom behaviors. Teachers with high self-efficacy appear to have greater persistence, adaptability, and instructional confidence, which enables them to address diverse student needs and instructional challenges (Bandura, 1997; Burić & Kim, 2020). The mediating effects of TSE are more pronounced in the pathways from IL than from DL, indicating that structured leadership practices may be effective in enhancing teachers' confidence and, consequently, overall teaching quality (Altun et al., 2025; Chen et al., 2020).

The moderating effect of TCOL

TCOL plays a nuanced and conditional role in shaping TP, and in Vietnam, collaborative culture is reinforced by collectivist values (Truong et al., 2017). The results indicate that TCOL strengthens only the relationship between TSE and cognitive activation, without influencing the direction or strength of it on other TP dimensions. Teachers who want to enhance their teaching, especially when introducing new lessons, activate their students' cognitive ability by using tasks that challenge them to engage in higher-order thinking, problem-solving, and critical questioning (Fischer et al., 2020). These tasks are often

unpredictable and require teacher innovation and risk-taking (O'Shea, 2021). Because of this, teachers might need more collaboration to develop strategies to improve their efficacy in enhancing students' performance in this area. Teachers who collaborate feel more supported and confident in trying new teaching methods (Çoban et al., 2023).

Found in this study, TCOL did not strengthen the path between TSE and clarity of instruction, which involves providing clear, structured explanations of content, which is a relatively routine practice (Chen et al., 2020). It can be explained that teachers can handle this TP dimension on their own, using their own teaching skills, and they might not bring it up in discussion, or might think it is not important to them. Likewise, TCOL did not moderate the path between TSE and classroom management, which involves routine tasks like maintaining order, setting rules, and ensuring time-on-task, and individual teacher competence (Chen et al., 2020). Highly effective teachers can be more effective at managing classrooms, such as handling disruptions and organizing their learning environments (Van Tartwijk & Hammerness, 2011). TCOL was found to have no effect on the interaction between TSE and classroom assessment, which refers to the methods teachers use to evaluate student performance, including both formative and summative assessments (Stiggins & DuFour, 2009). Again, assessment practices can be standardized by the school or MOET and follow guidelines set, and this may discourage them from generating innovative ideas or taking risks. Additionally, highly self-efficacious teachers can be more confident in their ability to assess students and use assessment data effectively (Black & Wiliam, 2018). Hence, they might not prioritize this TP dimension while collaborating.

In this context, the exertion of TCOL in the TSE-TP relationship may indicate a preference for autonomous work, which can become a barrier when teacher autonomy is interpreted as independence or exclusive focus on individual tasks (Vangrieken et al., 2017). Chen et al. (2025) reported no effect of TSE on TCOL. Future research should examine teachers' attitudes toward collaboration with colleagues, including the perceived value of such collaborative efforts (Vangrieken et al., 2017), forms of collaboration (Wang et al., 2025), communities of practice (Wenger, 1998), and collaboration networks (Schlager et al., 2008).

Chen et al. (2020) found that instructional efficacy has a stronger positive impact on instructional clarity than on classroom management effectiveness. Efficacy in classroom management positively affects classroom management practice more than instruction efficacy, and instruction efficacy has a very strong positive influence on cognitive activation practice, while classroom management efficacy has a moderate negative influence on cognitive activation practice. This clearly suggests that when TCOL interacts with each dimension of TSE and TP, it can also yield different results.

Implications and Limitations

Theoretical implications

Through this understanding, TCOL helps teachers access resources (shared knowledge, professional legitimacy, and support networks), which, in turn, can positively influence TSE (Bourdieu, 1986).

Enhanced TSE fuels teachers' confidence in their ability to adopt innovative practices, such as the cognitive activation strategy to help students critically think of the answers to the task questions (Praetorius & Charalambous, 2018). Such innovative practices align with the current educational reform (Circular 32), which requires teachers to use their autonomy and innovative strategies to influence student learning.

On the other hand, in highly centralized Confucian educational systems, the emphasis on hierarchy and respect for authority may constrain collaborative efforts in routine, standardized practices (Nguyen et al., 2018), such as classroom management and classroom assessment, which are primarily shaped by institutional or classroom norms. Additionally, clarity of instruction may not be a focus in this collaborative network, and teachers may believe they are competent to handle this dimension, hence leaving it out of the discussion. These findings underscore the context-specific interaction between TCOL and TSE, emphasizing the importance of a nuanced understanding of how collaboration shapes teaching practices across diverse cultural and educational contexts.

Practical implications

First, school leaders are encouraged to actively involve teachers in the design and evaluation of teaching practices. Leaders should articulate a shared vision for instruction and foster a supportive environment that enhances teachers' competencies through targeted professional development. Second, education authorities are advised to invest in leadership development programs that strengthen school leaders' capacity to drive instructional improvement and manage teacher collaboration effectively. Ongoing refinement of curriculum and teaching policies is essential to ensure alignment between reform objectives and classroom implementation. Additionally, teachers should participate in purposeful collaboration, guided by clear structures, shared instructional goals, and leadership support, so that collaborative processes contribute meaningfully to teaching improvement rather than becoming routine or symbolic.

Limitations

This study has several limitations that suggest directions for future research. First, the reliance on cross-sectional data restricts causal inference and may introduce social desirability bias. Future studies should employ longitudinal, quasi-experimental, or mixed methods designs and gather data from multiple sources to enhance the robustness of findings. Second, while this study proposes a mediation-moderation model, it does not fully elucidate the mechanisms by which teacher collaboration may have detrimental or counterproductive effects on teaching practice. Future research should develop and evaluate strategies to explain these negative effects, thereby facilitating a more critical and comprehensive examination of the limitations of teacher collaboration.

Declarations

Author Contribution

The first author is responsible for conceptualization, research process and result supervision, and feedback-giving.The second author is responsible for conceptualization, data collection, formal analysis, writing original draft, writing review & editing.The third author is responsible for writing the methodology, formal analysis, writing original draft, and visualization of the results.

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Data Availability

The data analyzed in this study are publicly available from the TALIS 2024 Data Repository. The data can be accessed at [https://www.oecd.org/en/data/datasets/talis-2024-database.html] (https:/www.oecd.org/en/data/datasets/talis-2024-database.html) . Additional materials or analytic files are available from the authors upon reasonable request and subject to the data-use policies of the OECD.

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Figures

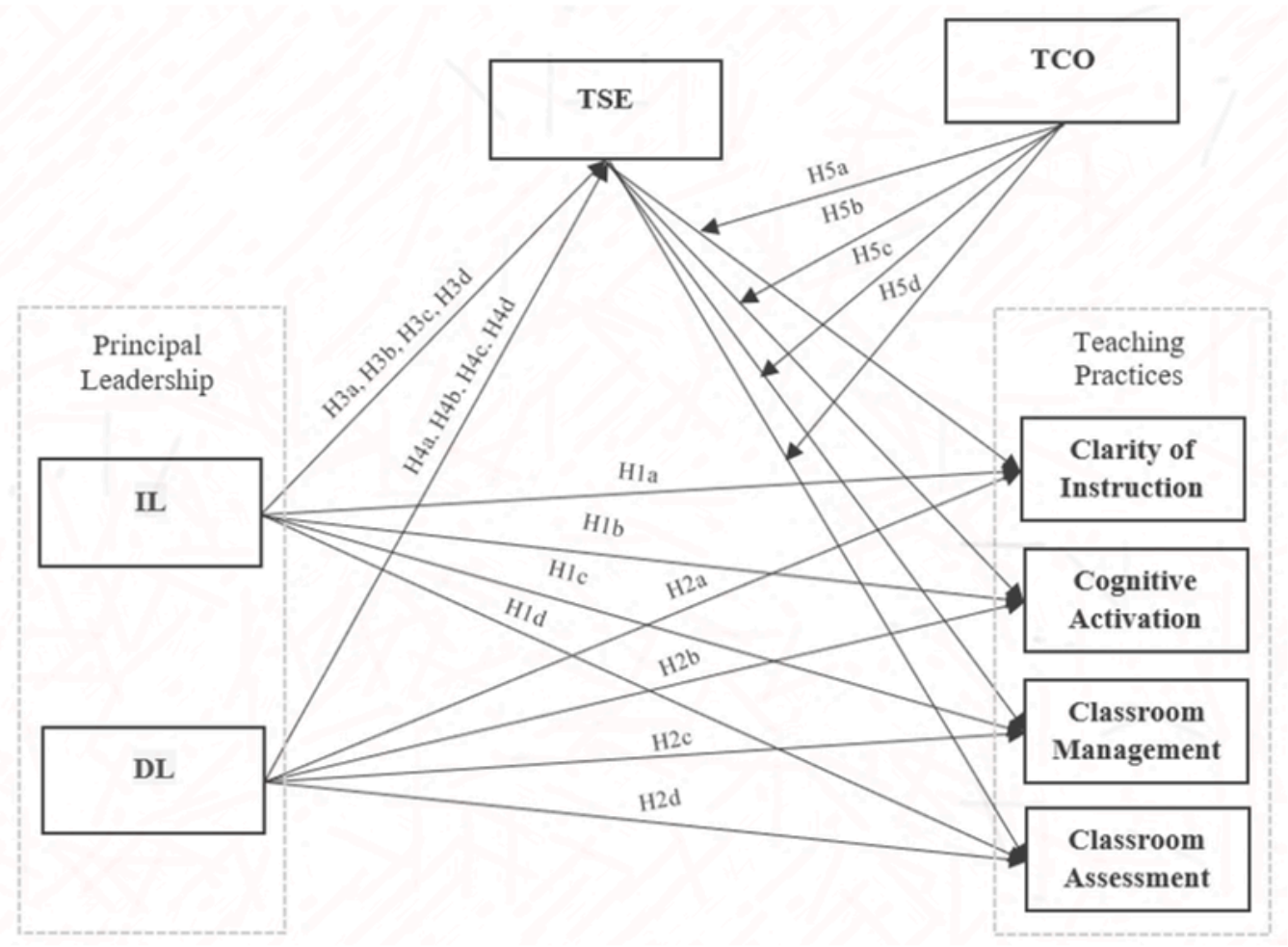


Figure 1

Conceptual Framework

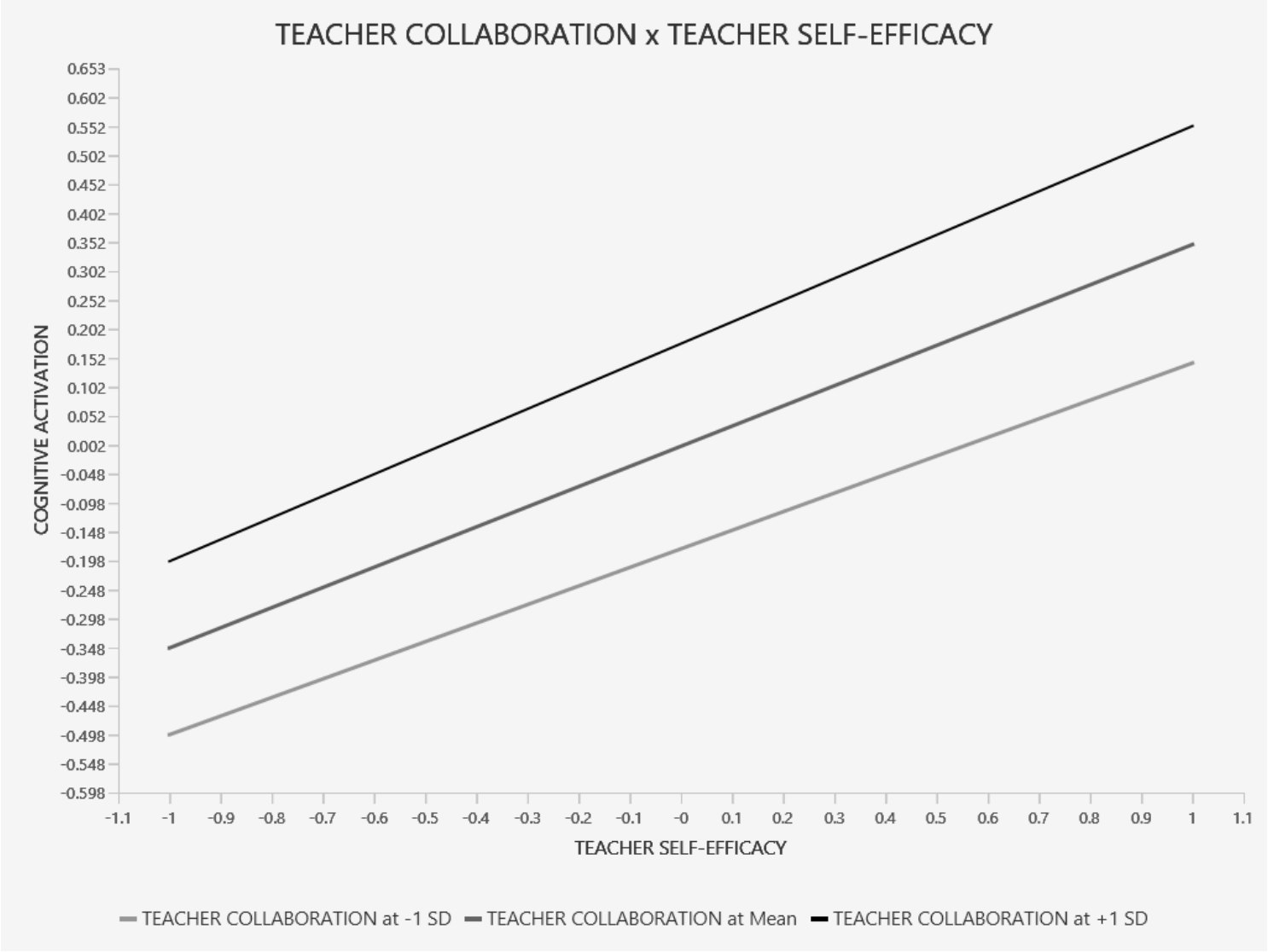


Figure 2

Teacher collaboration amplifies the influence of TSE on cognitively activating instructional practices