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RESEARCH ARTICLE

# A Performance Improvement Model of Discipline Leaders in Higher Vocational Colleges in Shandong Province

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**Abstract**

The rapid transformation of China's vocational education system, driven by national initiatives such as the "Double High Plan," has significantly elevated the strategic role of discipline leaders in higher vocational colleges. Despite these expectations, many discipline leaders face challenges in managing expanded responsibilities, developing essential competencies, and accessing sufficient organizational support, resulting in performance gaps. This study investigates the determinants of discipline leaders' work performance in higher vocational colleges in Shandong Province. Grounded in Social Cognitive Theory and the Job Characteristics Model, a mixed-methods approach was employed. Quantitative data were collected from 470 valid respondents through structured questionnaires and analyzed using confirmatory factor analysis and structural equation modeling. Qualitative insights were obtained from semi-structured focus group interviews and analyzed through thematic coding, with triangulation applied to enhance the robustness of the findings. The results reveal that job characteristics, competency, and organizational support significantly influence work performance both directly and indirectly through self-efficacy and team cohesiveness. These mediating variables play a central role in translating individual and organizational factors into performance outcomes. Furthermore, team feedback functions as a reinforcing mechanism, strengthening the effects of self-efficacy and team cohesiveness on performance. The study contributes to the literature by integrating individual, organizational, and team-level perspectives into a comprehensive performance model. Practically, the findings provide evidence-based guidance for improving job design, competency development, and organizational support systems to enhance leadership effectiveness in vocational education.

**Keywords:** Vocational education, Self-efficacy, Organizational support, Work performance

## Introduction

The Chinese government has attached great importance to vocational education development in recent years, issuing multiple policies to promote the professional construction of higher vocational colleges (HVCs) in response to economic transformation and industrial upgrading. Among these, the Professional Cluster Development policy and the Chinese-characteristic High-level Vocational Schools and Major Construction Plan, known as the "Double High Plan," have become major policy initiatives driving reform and innovation in vocational education (Yu et al., 2025). These initiatives have placed higher vocational colleges under increasing pressure to strengthen professional clusters, deepen industry–education integration, improve school–enterprise cooperation, and cultivate skilled talents who can respond to changing labor market demands. In this policy environment, discipline leaders serve as core actors in professional cluster construction and development, as they are expected to possess solid professional knowledge, management skills, and the capacity to promote teaching innovation, research development, and industry collaboration.

However, empirical evidence indicates that the performance of discipline leaders has failed to meet policy objectives across multiple dimensions. In teaching, many struggle to adapt to emerging methods such as information-based teaching, flipped classrooms, and SPOC blended learning while balancing

administrative duties (Zhu et al., 2023). In research, insufficient resources and interdisciplinary challenges result in outputs that fall short of expectations, limiting the overall research strength of HVCs. In professional practice, volatile industry demands cause cooperative projects to encounter implementation difficulties, resulting in limited effectiveness in practical teaching. Furthermore, discipline leaders lack systematic management training and leadership development, making it difficult to motivate teams and integrate resources, thereby affecting the cohesion and execution of professional teams. These problems suggest that discipline leaders' work performance is not determined by individual capability alone, but is shaped by the interaction of job design, professional competency, organizational support, psychological confidence, and team-based working conditions.

These performance gaps point to a deeper issue: the absence of an integrated, evidence-based framework that accounts for the multifaceted determinants of discipline leaders' work performance. Previous scholarship on teacher development in higher education, including the models proposed by Bergquist and Phillips (1975), has made valuable contributions by encompassing personal, teaching, professional, and organizational development. Nevertheless, existing research has predominantly focused on individual-level variables such as teachers' abilities, job satisfaction, motivation, and self-efficacy, while giving less attention to organizational systems, performance incentives, and resource allocation that shape the broader work environment. Similarly, studies emphasizing individual psychological variables have largely overlooked the roles of team cooperation, communication, and feedback in driving performance outcomes. Moreover, the prevailing focus on teaching performance has left management capability and industry–education integration insufficiently examined. In sum, research on team-level variables, such as organizational support, team cohesiveness, and team feedback, and their influence on discipline leaders' work performance remains insufficiently developed.

This study addresses these gaps by examining the multifaceted determinants of discipline leaders' work performance in higher vocational colleges in Shandong Province. Grounded in the Job Characteristics Model, competency theory, organizational support theory, Social Cognitive Theory, and team effectiveness theory, this study comprehensively examines the influence of variables at both individual and organizational levels on work performance. Specifically, the study investigates the direct effects of job characteristics, competency, and organizational support; the mediating roles of self-efficacy and team cohesiveness; and the moderating influence of team feedback within a proposed performance improvement model. By integrating individual, organizational, and team-level factors into a single analytical framework, this study seeks to explain not only whether these factors influence work performance, but also how and under what conditions such influence occurs.

The significance of this study lies in its contribution to both theory and practice. Theoretically, it provides a multidimensional framework for understanding the performance of discipline leaders in HVCs, a domain that has received limited scholarly attention compared with the general higher education sector. By introducing team-level variables such as organizational support, team cohesiveness, and team feedback alongside individual-level predictors, this study addresses the research gap regarding the organization's impact on teacher development and offers a more systematic theoretical framework for vocational education management research. Practically, the findings can assist human resource management departments in HVCs in designing more scientific performance appraisal and incentive mechanisms. By identifying and optimizing key influencing factors, managers can formulate targeted strategies, such as designing motivational work tasks, providing professional development training, strengthening organizational support, and improving feedback mechanisms, to stimulate the intrinsic motivation of discipline leaders and improve their overall performance. In this way, the study provides evidence-based guidance for enhancing leadership effectiveness, improving educational quality, and supporting the continuing reform of higher vocational education.

**Objectives**

1. To explore the effects of the job characteristics model, competency, and organizational support on self-efficacy, team cohesiveness, and discipline leaders'

work performance in higher vocational colleges in Shandong Province.

2. To explore the role of self- efficacy, team cohesiveness, and team feedback in the performance improvement model of discipline leaders in higher vocational colleges in Shandong Province.

3. To guide managers to improve discipline leaders' work performance in practice.

## Literature review

### Job characteristics

The Job Characteristics Model (JCM), proposed by Hackman and Oldham (1976), identifies five core job dimensions— skill variety, task identity, task significance, autonomy, and feedback— that jointly influence employees' experienced meaningfulness, responsibility, and knowledge of results, which in turn shape motivation, satisfaction, and performance. Research on job characteristics in educational organizations demonstrates that reasonable job design significantly promotes work performance, self-efficacy, and team cohesiveness. In educational settings, skill variety and autonomy are core characteristics affecting teachers' performance, as diversified responsibilities such as curriculum design, classroom management, and academic research help teachers continuously improve their abilities and enrich their teaching experience (Grobelna, 2019). Autonomy and job feedback are also identified as major factors enhancing teachers' self-efficacy, while task identity and significance strengthen team cohesiveness by fostering interdependence among team members (Peiró et al., 2019). This study adopts the JCM framework and measures job characteristics using 10 items adapted from Hackman and Oldham (1975) and Idaszak and Drasgow (1987), covering skills, abilities, process tasks, autonomous decision- making, impact of outcomes, and feedback.

### Competency

The concept of competency was established by McClelland (1973), who defined it as the abilities, skills, traits, and motivations directly related to work that can effectively predict performance. McClelland's Iceberg Model distinguishes between explicit competencies (knowledge and professional skills) that are easily measured and cultivated, and implicit competencies (personality characteristics, motives, and values) that serve as crucial factors differentiating high performers from average performers. In the context of higher education, teacher competency refers to the professional knowledge, skills, and values related to successful teaching, encompassing both professional proficiency— including curriculum development, instructional design, and research methodology— and managerial acumen such as team coordination, resource integration, and organizational leadership. Research indicates that competency influences work performance both directly, through task execution, and indirectly, by enhancing self-efficacy and team cohesiveness through knowledge sharing, skill complementarity, and mutual trust among team members. This study measures competency using 10 items based on McClelland (1973), assessing emotional control, interpersonal influence, teaching adaptability, research methodology, and self- reflection capacity.

### Organizational support

Perceived Organizational Support (POS), introduced by Eisenberger et al. (1986), refers to the degree to which employees perceive that their organization values their contributions and cares about their well- being. Based on social exchange theory and the norm of reciprocity, POS theory posits that employees who perceive greater institutional support develop stronger psychological motivation, organizational commitment, and work engagement, reciprocating through improved performance. Research has demonstrated that organizational support significantly improves work performance by fulfilling employees' psychological needs: adequate resource provision enables efficient task completion, emotional support enhances positive work attitudes, and career development opportunities strengthen confidence and motivation. At the team level, organizational support promotes cohesiveness through fair resource allocation, clear strategic goals, and a collaborative organizational culture that fosters trust and shared responsibility among team members. This study measures organizational support using 10 items based on Eisenberger et al. (1986), covering perceived valuation of contributions, concern for well-being, acknowledgment of achievements, provision of funding, and developmental opportunities.

**Self-efficacy**

Self-efficacy, introduced by Bandura (1977) within Social Cognitive Theory, refers to an individual's belief in their ability to organize, execute, and complete tasks to achieve particular goals. This belief influences goal-setting, effort levels, persistence in the face of adversity, and emotional regulation. In educational contexts, teacher self-efficacy encompasses beliefs about the capacity to influence student development, design effective instruction, manage classrooms, and engage students in learning. Research consistently demonstrates that self-efficacy mediates the relationships between contextual factors and performance: job characteristics enhance self-efficacy through meaningful and autonomous work, competency strengthens self-efficacy through accumulated mastery experiences, and organizational support bolsters self-efficacy through training opportunities and positive reinforcement (Bandura, 1986). Higher self-efficacy enables discipline leaders to maintain positive attitudes when confronting challenges in teaching and research, and plays a pivotal role in platform development, discipline construction, and team leadership. This study measures self-efficacy using 6 items based on Bandura (1977) and Woolfolk Hoy and Burke-Spero (2005).

**Team cohesiveness**

Team cohesiveness, defined by Festinger et al. (1950) as the sum of attractions among team members and the motivation to remain in the team, has been conceptualized as a multidimensional construct comprising task cohesion— the willingness to collaborate around shared goals—and social cohesion—the emotional bonds among members (Chang & Bordia, 2001). In high-cohesion teams, members exhibit stronger mutual trust, more effective communication, greater knowledge sharing, and higher commitment to collective goals. Research confirms that team cohesiveness mediates the relationships between organizational factors and performance: job characteristics promote cohesiveness through interdependent task structures, competency complementarity among members reduces internal conflicts, and organizational support fosters a shared sense of belonging. Team cohesiveness translates individual efforts into team-level outcomes, enabling more efficient task execution, reduced intra-group conflict, and greater adaptability in complex environments. This study measures team cohesiveness using 8 items from the GEQ Group Cohesion Scale (Chang & Bordia, 2001).

**Team feedback**

Team feedback refers to the ongoing, constructive, and timely professional communication that team members provide regarding academic decisions, teaching actions, curriculum innovation, and leadership performance. As a multidimensional construct, team feedback encompasses cognitive dimensions (information accuracy and relevance), behavioral dimensions (support for actual changes in practice), and relational dimensions (emotional tone and psychological safety). Research demonstrates that frequent and high-quality team feedback enhances individual task performance, psychological engagement, and professional competence by reinforcing clarity of expectations, promoting reflective learning, and sustaining motivation. At the team level, feedback strengthens shared mental models, increases collaboration efficiency, and sustains adaptive improvement. Consistent with organizational learning theory (Argyris & Schön, 1996), team feedback functions as a moderating variable that amplifies or constrains the effects of self-efficacy and team cohesiveness on performance: when feedback is frequent, the positive impacts of psychological and collective resources on work performance are significantly strengthened.

**Work performance**

Work performance has evolved from unidimensional conceptualizations focused solely on task outputs to multidimensional frameworks integrating behaviors and outcomes. Katz and Kahn (1978) proposed that individual behavior in organizations includes joining and remaining in the organization, fulfilling prescribed performance tasks, and initiating activities beyond specified standards. Building on this foundation, Borman and Motowidlo (1993) distinguished between task performance and contextual performance, and subsequent scholars added adaptive performance as a third dimension reflecting behavioral adjustment in response to environmental changes. In the context of higher vocational colleges,

discipline leaders' work performance encompasses task performance (completion of teaching and research tasks, curriculum development), contextual performance (collegial cooperation, knowledge sharing, organizational citizenship), and adaptive performance (flexibility in responding to policy changes, technological innovation, and cross-cultural engagement). This study measures work performance using 12 items based on Katz and Kahn (1978), modeled as a second-order construct comprising these three sub-dimensions.

**Research hypotheses**

Based on the theoretical foundations and empirical evidence reviewed above, 18 hypotheses are proposed, organized into three groups corresponding to the analytical framework.

Direct effects (H1–H11): H1: Job characteristics have a positive impact on self-efficacy. H2: Job characteristics have a positive impact on discipline leaders' work performance. H3: Job characteristics have a positive impact on team cohesiveness. H4: Competency has a positive impact on self-efficacy. H5: Competency has a positive impact on discipline leaders' work performance. H6: Competency has a positive impact on team cohesiveness. H7: Organizational support has a positive impact on self-efficacy. H8: Organizational support has a positive impact on discipline leaders' work performance. H9: Organizational support has a positive impact on team cohesiveness. H10: Self-efficacy has a positive impact on discipline leaders' work performance. H11: Team cohesiveness has a positive impact on discipline leaders' work performance.

Mediating effects (H12-H17): H12: Self-efficacy mediates the relationship between job characteristics and work performance. H13: Self-efficacy mediates the relationship between competency and work performance. H14: Self-efficacy mediates the relationship between organizational support and work performance. H15: Team cohesiveness mediates the relationship between job characteristics and work performance. H16: Team cohesiveness mediates the relationship between competency and work performance. H17: Team cohesiveness mediates the relationship between organizational support and work performance.

Moderating effects (H18a-H18b): H18a: Team feedback moderates the relationship between self-efficacy and work performance, such that the relationship is stronger when feedback is frequent. H18b: Team feedback moderates the relationship between team cohesiveness and work performance, such that the relationship is stronger when feedback is frequent.

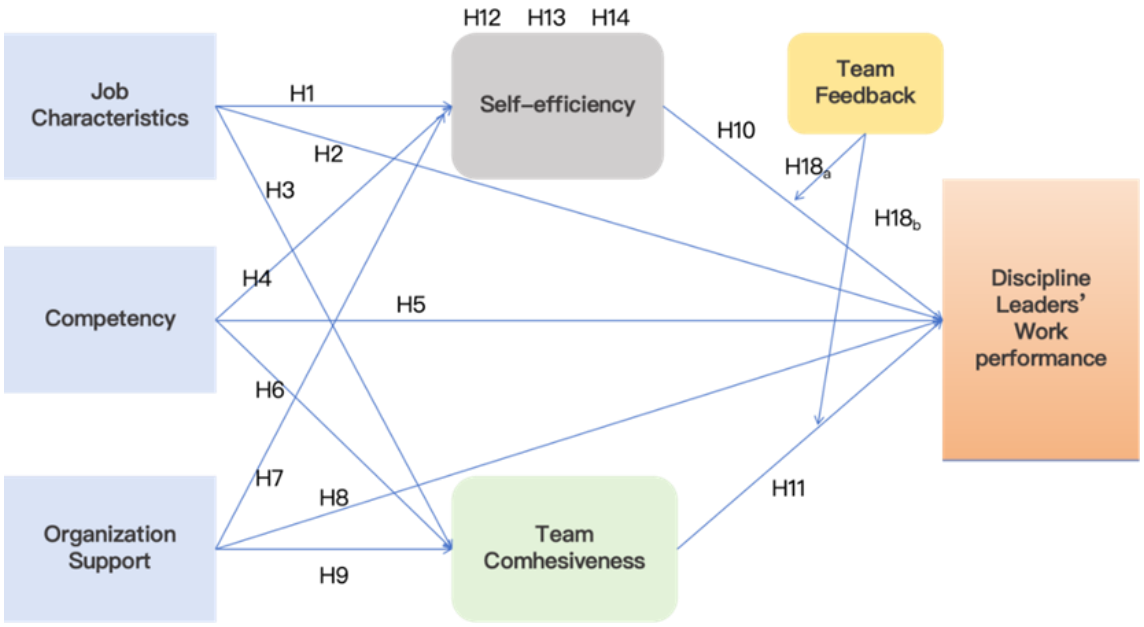



**Figure 1** Conceptual framework

**Conceptual framework**

Figure 1 presents the conceptual framework guiding this study. Three independent variables—job characteristics, competency, and organizational support— are hypothesized to directly influence discipline leaders' work performance (H2, H5, H8) and to predict two mediating variables: self-efficacy (H1, H4, H7) and team cohesiveness (H3, H6, H9). Self-efficacy and team cohesiveness, in turn, exert direct effects on work performance (H10, H11) and serve as mediators transmitting the effects of the independent variables to performance (H12-H17). Team feedback functions as a moderating variable, strengthening the relationships between self- efficacy and work performance (H18a) and between team cohesiveness and work performance (H18b).

**Research methodology**

**Population and samples**

This study employed a mixed-methods approach grounded in Social Cognitive Theory (Bandura, 1986) and the Job Characteristics Model (Hackman & Oldham, 1976). Shandong Province has 90 higher vocational colleges, comprising 69 public and 21 private institutions. A combined Stratified Random Sampling and Proportionate Sampling strategy was employed, stratifying institutions by type (public vs. private) and quality level (high-, medium-, and low-performing) based on official datasets from the Shandong Provincial Department of Education. Specifically, the sampling process was conducted in two stages. First, the 90 higher vocational colleges in Shandong Province were used as the institutional- level sampling frame and were stratified according to two criteria: institutional type, namely public and private colleges, and institutional quality level, namely high-, medium-, and low-performing institutions. Colleges were then randomly selected from each stratum in proportion to the number of institutions represented in that stratum. From this stratification, 20 vocational colleges were randomly selected, encompassing a total population of 822 discipline leaders. Second, after the 20 sampled colleges had been identified, lists of discipline leaders within each institution were obtained through institutional coordinators and used as the individual-level sampling frame. The number of questionnaires distributed to each college was allocated proportionally according to the number of discipline leaders in that college. Respondents were then selected from the corresponding institutional lists. Following the recommended sample-to- parameter ratio for structural equation modeling (Bentler & Chou, 1987; Jackson, 2003), 560 formal questionnaires were distributed through proportionate sampling, and 470 valid responses were collected, yielding an effective response rate of 83.93%. This procedure was adopted to ensure that the final sample reflected both institutional characteristics and the distribution of discipline leaders across the selected higher vocational colleges. For the qualitative component, focus group interviews were conducted with 9 discipline leaders from the sampled colleges, representing diverse disciplinary backgrounds (engineering, liberal arts, arts, and applied technology) with professional tenure ranging from 8 to 22 years.

**Research instrument**

Two research instruments were employed in this study: (1) a structured survey questionnaire for quantitative data collection, and (2) a semi-structured focus group interview outline for qualitative data collection.

The survey questionnaire consisted of two parts. Part 1 captured demographic information including gender, age, educational background, years of experience, and job position. Part 2 contained measurement items for six variables using a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree): Job Characteristics (10 items, adapted from Hackman & Oldham, 1975; Idaszak & Drasgow, 1987), Competency (10 items, based on McClelland, 1973), Organizational Support (10 items, based on Eisenberger et al., 1986), Self-Efficacy (6 items, based on Bandura, 1977; Woolfolk Hoy & Burke-Spero, 2005), Team Cohesiveness (8 items, based on Chang & Bordia, 2001), and Work Performance (12 items, based on Katz & Kahn, 1978), modeled as a second-order construct comprising task performance, contextual performance, and adaptive performance. Content validity was assessed using the Index of Item-Objective Congruence (IOC) with expert reviewers; only items scoring above 0.50 were retained. Reliability was confirmed through a

pretest with 30 professional leaders, with all Cronbach's Alpha values exceeding 0.80.

The semi-structured focus group interview outline was designed around the core variables of the study, covering self- efficacy, team cohesiveness, job characteristics, competency, organizational support, and work performance. The outline balanced guiding questions with open- ended space for respondents to express personal experiences. Interviews lasted approximately 90 minutes each, were audio- recorded with participant consent, transcribed verbatim, and analyzed using NVivo14. The IOC approach is conceptually consistent with the Content Validity Index (CVI) commonly used in international research, ensuring the adequacy of content validation.

**Collection of data**

Questionnaires were distributed to discipline leaders in the 20 sampled institutions via web- based platforms with the assistance of institutional coordinators. Standardized procedures were implemented for distribution and recovery, and all returned questionnaires were screened to remove invalid or incomplete responses, resulting in 470 valid questionnaires. Focus group interviews were conducted in both offline and online formats with participant consent. A multi- method triangulation strategy was employed to enhance credibility: data-source triangulation through interviews with discipline leaders and domain experts from five universities, investigator–method triangulation via a structured expert evaluation of 15 items across three dimensions (Propriety, Feasibility, and Utility) rated by 10 domain experts (Lynn, 1986; Creswell & Plano Clark, 2018), and Delphi- style consensus analysis using interquartile range thresholds (Diamond et al., 2014; von der Gracht, 2012).

**Data analysis**

Quantitative data were analyzed using SPSS 27.0 and AMOS 27.0. Descriptive statistics outlined sample characteristics. Confirmatory Factor Analysis (CFA) verified the alignment between measured variables and underlying constructs, with convergent validity evaluated through factor loadings, composite reliability (CR > 0.70), and average variance extracted (AVE > 0.50), and discriminant validity confirmed by comparing $\sqrt{}$AVE with inter- construct correlations. Structural Equation Modeling (SEM) tested the hypothesized direct relationships, with model fitness evaluated against established criteria (Hair et al., 2019; Kline, 2023). Bootstrap mediation testing (5,000 resamples, 95% bias- corrected confidence intervals) examined indirect effects following Hayes (2013). Hierarchical regression analysis tested the moderating effect of team feedback frequency. Qualitative data were analyzed through open, axial, and selective coding using NVivo14 to identify core themes and patterns. Distributional assumptions were verified through histogram and P–P plot inspection (Field, 2018; Hair et al., 2019). To assess potential common method bias, Harman's single-factor test was conducted. The results indicated that the first factor accounted for less than 50% of the total variance, suggesting that common method bias was not a serious concern in this study.

**Results**

**Demographic characteristics**

A total of 560 questionnaires were distributed to discipline leaders across 20 higher vocational colleges in Shandong Province, and 470 valid responses were collected, yielding an effective response rate of 83.93%. The sample was relatively balanced in gender composition, with 229 males (48.72%) and 241 females (51.28%). The majority of respondents were aged 31-40 (53.62%), held a bachelor's degree (47.45%) or master's degree (39. 36%), and occupied Assistant Lecturer positions (43. 40%). Most respondents reported 3-5 years (39.57%) or 6-10 years (35.53%) of professional tenure. Regarding team feedback frequency, the distribution was nearly even: 236 respondents (50.21%) reported seldom feedback and 234 (49.79%) reported frequent feedback.

**Normality, reliability, and validity**

All variables demonstrated acceptable normality, with absolute skewness values ranging from 0. 238 to 0.361 and absolute kurtosis values from 0.841 to 1.098, well within the thresholds of 3 and 10 respectively. Reliability analysis confirmed high internal consistency across all constructs, with Cronbach's Alpha coefficients ranging from 0.808 to 0.943 (Table 1).

**Table 1** Reliability analysis

| Dimension | Cronbach's alpha | Items |
|---|---|---|
| Job Characteristics | 0.943 | 10 |
| Competency | 0.927 | 10 |
| Organizational Support | 0.921 | 10 |
| Self-Efficacy | 0.883 | 6 |
| Team Cohesiveness | 0.900 | 8 |
| Work Performance – Task Performance | 0.880 | 5 |
| Work Performance – Contextual Performance | 0.833 | 4 |
| Work Performance – Adaptive Performance | 0.808 | 3 |

**Note:** N = 470. All Cronbach's Alpha values exceed the recommended threshold of 0.70.

Confirmatory factor analysis (CFA) indicated an acceptable model fit: CMIN/DF = 1.307, GFI = 0.879, AGFI = 0.868, RMSEA = 0.026, IFI = 0.971, CFI = 0.971, TLI = 0.969, and NFI = 0.888. Standardized factor loadings ranged from 0.674 to 0.888, with most items exceeding the recommended threshold of 0.70 and a few slightly below but still within acceptable limits. Composite reliability (CR) values ranged from 0.811 to 0.943, and average variance extracted (AVE) values ranged from 0.533 to 0.625, all surpassing the recommended thresholds of 0.70 and 0.50 respectively, confirming convergent validity. Discriminant validity was also established, as the square roots of AVE values for all constructs exceeded the corresponding inter-construct correlations (Table 2).

**Table 2** Correlation matrix, means, standard deviations, and √AVE

| | Mean | SD | JC | Com | OS | SE | TC | DLWP |
|---|---|---|---|---|---|---|---|---|
| JC | 3.579 | 0.915 | **0.791** | | | | | |
| Com | 3.604 | 0.903 | 0.360*** | **0.754** | | | | |
| OS | 3.624 | 0.866 | 0.204*** | 0.322*** | **0.737** | | | |
| SE | 3.808 | 0.768 | 0.432*** | 0.446*** | 0.416*** | **0.750** | | |
| TC | 3.730 | 0.818 | 0.437*** | 0.445*** | 0.414*** | 0.368*** | **0.730** | |
| DLWP | 3.645 | 0.777 | 0.477*** | 0.481*** | 0.462*** | 0.535*** | 0.547*** | **0.771** |
| **AVE** | | | 0.625 | 0.568 | 0.543 | 0.562 | 0.533 | 0.595 |

**Note:** Diagonal values in bold represent √AVE. JC = Job Characteristics; Com = Competency; OS = Organizational *Support; SE = Self-Efficacy; TC = Team Cohesiveness; DLWP = Discipline Leaders' Work Performance. ***p < 0.001.*

**Structural equation modeling: Direct effects**

The structural equation model demonstrated good fit (CMIN/DF = 1.306, RMSEA = 0.026, IFI = 0.971, CFI = 0.971, TLI = 0.970, GFI = 0.879, AGFI = 0.868). Table 3 presents the standardized path coefficients for all hypothesized direct relationships.

**Table 3** Structural equation modeling results

| Path | Std. Estimate | S.E. | C.R. | p | $R^2$ |
|---|---|---|---|---|---|
| JC → SE | 0.296 | 0.031 | 6.144 | <0.001 | 0.410 |
| Com → SE | 0.280 | 0.037 | 5.610 | <0.001 | |
| OS → SE | 0.294 | 0.034 | 6.062 | <0.001 | |
| JC → TC | 0.305 | 0.035 | 6.432 | <0.001 | 0.406 |
| Com → TC | 0.266 | 0.042 | 5.444 | <0.001 | |
| OS → TC | 0.294 | 0.039 | 6.186 | <0.001 | |
| JC → DLWP | 0.198 | 0.038 | 3.872 | <0.001 | 0.678 |
| Com → DLWP | 0.146 | 0.045 | 2.825 | 0.005 | |
| OS → DLWP | 0.197 | 0.043 | 3.799 | <0.001 | |
| SE → DLWP | 0.275 | 0.069 | 4.661 | <0.001 | |
| TC → DLWP | 0.296 | 0.059 | 5.088 | <0.001 | |

**Note:** JC = Job Characteristics; Com = Competency; OS = Organizational Support; SE = Self-Efficacy; TC = Team Cohesiveness; DLWP = Discipline Leaders' Work Performance.

Job characteristics, competency, and organizational support all exerted significant positive effects on self-efficacy ($\beta = 0.296$, 0.280, and 0.294, respectively; all $p < 0.001$), collectively explaining 41.0% of its variance. Similarly, these three independent variables significantly and positively predicted team cohesiveness ($\beta = 0.305$, 0.266, and 0.294, respectively; all $p < 0.001$), accounting for 40.6% of its variance. Regarding discipline leaders' work performance, all five predictors demonstrated significant positive effects: job characteristics ($\beta = 0.198$, $p < 0.001$), competency ($\beta = 0.146$, $p = 0.005$), organizational support ($\beta = 0.197$, $p < 0.001$), self-efficacy ($\beta = 0.275$, $p < 0.001$), and team cohesiveness ($\beta = 0.296$, $p < 0.001$). Together, these variables explained 67.8% of the variance in work performance.

**Mediation effects**

Bootstrap mediation testing (5,000 resamples, 95% bias-corrected confidence intervals) was conducted to examine the mediating roles of self-efficacy and team cohesiveness (Table 4).

All indirect effects were statistically significant, as none of the 95% confidence intervals contained zero. Self-efficacy partially mediated the effects of job characteristics, competency, and organizational support on work performance, accounting for 21.9%, 25.5%, and 22.2% of the respective total effects. Team cohesiveness similarly served as a partial mediator, explaining 24.6%, 26.2%, and 23.8% of the respective total effects. Notably, for competency, the combined indirect effects through self-efficacy and team cohesiveness (51.7%) exceeded the direct effect (48.3%), highlighting the critical importance of these

mediating mechanisms in translating competency into performance outcomes.

**Moderation effects of team feedback**

Hierarchical regression analysis was employed to test the moderating effect of team feedback frequency, as interaction effects were not directly modeled within the structural equation modeling framework due to model complexity.

**Table 4** Bootstrap mediation effects

| Path | Effect | SE | 95% CI [LLCI, ULCI] | % of Total |
|---|---|---|---|---|
| **Job Characteristics → DLWP** | | | | |
| Direct effect | 0.198 | 0.052 | [0.098, 0.304] | 53.5% |
| Via SE | 0.081 | 0.021 | [0.046, 0.129] | 21.9% |
| Via TC | 0.091 | 0.022 | [0.052, 0.140] | 24.6% |
| Total effect | 0.370 | 0.049 | [0.274, 0.465] | |
| **Competency → DLWP** | | | | |
| Direct effect | 0.146 | 0.052 | [0.042, 0.247] | 48.3% |
| Via SE | 0.077 | 0.021 | [0.041, 0.126] | 25.5% |
| Via TC | 0.079 | 0.021 | [0.043, 0.125] | 26.2% |
| Total effect | 0.302 | 0.052 | [0.197, 0.403] | |
| **Organizational Support → DLWP** | | | | |
| Direct effect | 0.197 | 0.051 | [0.094, 0.296] | 54.0% |
| Via SE | 0.081 | 0.020 | [0.048, 0.128] | 22.2% |
| Via TC | 0.087 | 0.021 | [0.050, 0.132] | 23.8% |
| Total effect | 0.365 | 0.045 | [0.281, 0.453] | |

**Note:** Bootstrap sample = 5,000. CI = confidence interval. SE (in path) = Self-Efficacy; TC = Team Cohesiveness; DLWP = Discipline Leaders' Work Performance.

**Table 5** Moderation effects of team feedback

| Moderating Path | Model | Interaction β | $\Delta R^2$ | $\Delta F$ | $R^2$ |
|---|---|---|---|---|---|
| SE × Feedback → DLWP | Model3 | 0.411*** | 0.041 | 29.041*** | 0.355 |
| TC × Feedback → DLWP | Model3 | 0.447*** | 0.055 | 40.577*** | 0.378 |

**Note:** Control variables: gender, age, education, position, years of experience. ***$p < 0.001$.

For the self-efficacy–performance relationship, the interaction term was significant ($\beta = 0.411$, $p < 0.001$), with $\Delta R^2 = 0.041$. Simple slope analysis revealed that under frequent feedback, the effect of self-efficacy on work performance was substantially stronger ($\beta = 0.747$, $p < 0.001$, 95% CI [0.644, 0.851]) compared to seldom feedback ($\beta = 0.341$, $p < 0.001$, 95% CI [0.235, 0.447]). Similarly, for the team cohesiveness–performance relationship, the interaction term was significant ($\beta = 0.447$, $p < 0.001$), with $\Delta R^2 = 0.055$. Under frequent feedback, the effect of team cohesiveness on performance was markedly amplified ($\beta = 0.779$, $p < 0.001$, 95% CI [0.679, 0.878]) relative to seldom feedback ($\beta = 0.308$, $p < 0.001$, 95% CI [0.202, 0.414]). These findings confirm that team feedback functions as a significant positive moderator, strengthening the translation of both self-efficacy and team cohesiveness into higher levels of work performance.

**Qualitative findings**

Semi-structured focus group interviews were conducted with 9 discipline leaders from the 20 sampled colleges, spanning engineering, liberal arts, arts, and applied technology fields, with professional tenure ranging from 8 to 22 years. Interview data were analyzed using NVivo14 through open, axial, and selective coding, yielding seven core themes aligned with the study's constructs.

Regarding self-efficacy, respondents identified it as an intrinsic motivator for sustained progress in course development, platform building, and management. Competition experience, research accomplishments, and peer support were cited as key factors enhancing self-efficacy, while the complexity and multitasking nature of their roles posed challenges to maintaining confidence. One participant explained that successful project experience and peer recognition helped strengthen confidence in leading the team and managing more complex teaching and administrative responsibilities (Participant 2). This statement illustrates how self-efficacy was strengthened through accumulated achievement and recognition from colleagues. For team cohesiveness, interviewees universally recognized it as essential for accomplishing teaching tasks and curriculum collaboration. Regular team-building activities, resource sharing, and the establishment of common teaching objectives were identified as effective measures for strengthening cohesiveness. One discipline leader explained that curriculum projects could not be completed by one person alone and that shared goals helped team members divide responsibilities clearly and support one another (Participant 5). This response suggests that team cohesiveness helped transform individual work into collective professional action.

In terms of job characteristics, challenging work and diversified roles were identified as the main manifestations, with time and task management ability directly affecting satisfaction and fulfillment. Role conflicts between research and teaching responsibilities emerged as a prominent challenge. Regarding competency, respondents emphasized the combination of professional proficiency and managerial acumen, noting that training, competitions, and practical projects served as primary pathways for competency development. For organizational support, respondents expressed a strong desire for more policy pilot opportunities, funding, training resources, and institutional incentives. Effective organizational support was reported to elevate job satisfaction and strengthen leadership capacity. For example, one participant explained that funding, training resources, and clear institutional incentives helped increase confidence in leading reform projects and supporting team members (Participant 7). This comment indicates that organizational support was perceived not only as material assistance, but also as a source of professional confidence and institutional recognition.

On work performance, interviewees identified interdisciplinary collaboration, project management experience, and the translation of teaching outcomes as pivotal factors. Regarding team feedback, most interviewees indicated that high-frequency, diverse, multi-channel, and timely feedback enables discipline leaders to adjust teaching directions, optimize task-completion strategies, and make more informed decisions. One interviewee explained that timely feedback from colleagues helped identify problems in curriculum implementation and allowed the team to adjust teaching strategies more quickly (Participant 9). These qualitative findings corroborated and enriched the

quantitative results, confirming that the proposed model captures the key mechanisms underlying discipline leaders' performance improvement.

**Research findings validation**

A multi- method triangulation strategy was employed to validate the findings. Ten domain experts from five universities independently evaluated the proposed conceptual framework using a 15-item structured questionnaire across three dimensions: Propriety, Feasibility, and Utility. Mean scores ranged from 4.4 to 4.8 (out of 5.0), with standard deviations between 0.43 and 0. 50, indicating strong positive assessment and high consensus. Delphi-style consensus analysis using interquartile range (IQR) revealed that the majority of items achieved IQR $\leq$ 1.0 (moderate consensus), while three items—Propriety 3 (Clarity of construct definition), Feasibility 1 (Implementability), and Feasibility 3 (Compatibility with institutional policies) — achieved IQR = 0. 25, indicating high consensus. Normality assessment through histogram and P–P plot inspection confirmed that the standardized residuals approximated a normal distribution, supporting the validity of the regression model. These results collectively reinforce the theoretical soundness, practical relevance, and methodological rigor of the proposed performance improvement model.

**Summary of hypothesis testing**

All 18 hypotheses proposed in this study were supported by the empirical evidence. Job characteristics, competency, and organizational support exerted significant positive effects on self- efficacy (H1, H4, H7), team cohesiveness (H3, H6, H9), and discipline leaders' work performance (H2, H5, H8). Self-efficacy (H10) and team cohesiveness (H11) significantly predicted work performance. Both self- efficacy and team cohesiveness partially mediated the relationships between the three independent variables and work performance (H12-H17). Team feedback significantly moderated the effects of self-efficacy (H18a) and team cohesiveness (H18b) on work performance, with frequent feedback amplifying these positive relationships.

**Discussion**

This study set out to examine the multifaceted determinants of discipline leaders' work performance in higher vocational colleges in Shandong Province, with three interrelated objectives: (1) to analyze the effects of job characteristics, competency, and organizational support on self- efficacy, team cohesiveness, and work performance; (2) to investigate the mediating roles of self-efficacy and team cohesiveness and the moderating influence of team feedback; and (3) to provide practical guidance for managers seeking to improve discipline leaders' work performance. Rather than merely confirming whether these variables were statistically associated with performance, the study sought to explain how individual, organizational, and team-level conditions jointly shape discipline leaders' capacity to perform effectively. The discussion is organized according to these objectives, integrating quantitative and qualitative findings with the existing literature.

**Effects of job characteristics, competency, and organizational support**

The structural equation modeling results confirmed that job characteristics, competency, and organizational support each exerted significant positive effects on self- efficacy, team cohesiveness, and discipline leaders' work performance, collectively explaining 67.8% of the variance in work performance ($R^2 = 0.678$). These findings are consistent with the Job Characteristics Model (Hackman & Oldham, 1976), Perceived Organizational Support Theory (Eisenberger et al., 1986), and Social Cognitive Theory (Bandura, 1986), which collectively explain how job design, human capital, and institutional backing shape individual and team outcomes. This suggests that discipline leaders' performance should not be understood as the result of individual capability alone. Instead, it emerges from the interaction between meaningful job design, professional competence, institutional resources, psychological confidence, and collaborative team conditions.

Job characteristics demonstrated significant positive effects on self-efficacy, team cohesiveness, and work performance, suggesting that enriched job design strengthens both psychological confidence and collaborative capacity among discipline leaders (Grobelna, 2019; Peiró et al., 2019). In higher vocational

colleges, meaningful tasks, autonomy, and feedback appear to help discipline leaders exercise professional judgment, connect their work with institutional goals, and sustain collaboration within teams. Qualitative data supported this interpretation, as discipline leaders described challenging and diversified roles as sources of fulfillment, while also noting role conflicts between teaching and research responsibilities. Thus, job design should be treated not only as an administrative arrangement, but also as a mechanism for improving confidence, responsibility, and collaboration among discipline leaders.

Competency also demonstrated significant positive effects on self-efficacy, team cohesiveness, and work performance. Although its direct contribution to performance was weaker than those of other predictors, its influence was substantially transmitted through psychological and social mechanisms. This finding indicates that competency does not translate into performance automatically. Rather, professional knowledge, teaching adaptability, research ability, and managerial acumen become more productive when they strengthen discipline leaders' confidence and enhance cooperation within teams. Focus group participants confirmed that competency development reflected the combination of professional proficiency and managerial acumen, with training, competitions, and practical projects serving as primary growth pathways. Accordingly, competency development should move beyond short-term skill training and should include reflective practice, team coordination, resource integration, and leadership development.

Organizational support positively predicted self-efficacy, team cohesiveness, and work performance. In the qualitative component, respondents universally expressed a strong desire for more funding, training resources, and institutional incentives, while acknowledging that effective support elevated job satisfaction and strengthened leadership capacity. This finding reinforces the view that organizational support functions as both a material and psychological resource. When institutions provide funding, platforms, recognition, and career development opportunities, discipline leaders are more likely to feel capable of completing demanding tasks and more willing to cooperate with colleagues. The relatively lower scores on items related to financial support and teaching environment suggest that material and infrastructural gaps remain a practical area requiring managerial attention. Therefore, institutional support should be designed as a continuous system rather than as occasional assistance tied to individual projects.

**Mediating roles of self-efficacy and team cohesiveness, and moderating role of team feedback**

Self-efficacy emerged as a key psychological mediator linking job characteristics, competency, and organizational support to work performance. Discipline leaders who reported higher self-efficacy demonstrated greater confidence in influencing student development, completing tasks, and contributing to institutional goals. Qualitative interviews reinforced this pattern, with respondents identifying self-efficacy as an intrinsic motivator for sustained progress in course development, platform building, and management. These findings suggest that self-efficacy serves as the psychological mechanism through which external conditions are transformed into active performance. Enriched work, stronger competency, and greater institutional support improve performance partly because they help discipline leaders believe that they can manage complex teaching, research, and leadership responsibilities.

Team cohesiveness also served as a significant mediator between the three independent variables and work performance. When discipline leaders collaborated in cohesive teams characterized by mutual trust, shared goals, and complementary competencies, performance improved through smoother communication, reduced conflict, and shared responsibility. Interview participants universally recognized team cohesiveness as essential for accomplishing teaching tasks and curriculum collaboration. These findings indicate that performance improvement in higher vocational colleges is not merely an individual process. It also depends on whether discipline leaders are embedded in teams that can share information, coordinate tasks, and sustain collective responsibility for professional cluster development.

Team feedback played a vital moderating role by amplifying the positive effects of both self-efficacy and team cohesiveness on work performance. This finding is consistent with organizational learning theory (Argyris & Schön, 1996) , which explains that constructive feedback reinforces clarity of expectations,

promotes reflective learning, and sustains motivation. Most interviewees indicated that high-frequency and timely team feedback enabled them to adjust teaching directions and optimize task-completion strategies. The findings therefore suggest that feedback operates as a reinforcing mechanism. Even when discipline leaders possess confidence and work within cohesive teams, their performance is strengthened further when feedback is frequent, specific, timely, and professionally constructive. Without such feedback, psychological confidence and team cohesion may not be fully converted into measurable performance outcomes.

**Practical implications for managers**

The findings provide actionable guidance for managers in higher vocational colleges. Rather than treating discipline leaders' work performance as the result of individual effort alone, managers should approach performance improvement as an integrated process involving job design, competency development, organizational support, team cohesiveness, and feedback-based learning. These factors should be managed together because meaningful work, professional capability, institutional resources, collaborative teams, and constructive feedback mutually reinforce one another in improving discipline leaders' performance.

## Suggestions

**Theoretical implications**

This study makes several theoretical contributions by integrating the Job Characteristics Model, Perceived Organizational Support Theory, and Social Cognitive Theory into a single validated framework for explaining discipline leaders' work performance. First, this research extends the Job Characteristics Model by demonstrating that competency and organizational support jointly predict work performance alongside job characteristics, providing a more contextually rich understanding of how job design functions in the multi-role context of vocational education. Second, the study deepens Perceived Organizational Support Theory by empirically demonstrating that organizational support enhances performance not only directly but also indirectly through self-efficacy and team cohesiveness—highlighting the importance of support systems in academic environments. Third, the moderating effect of team feedback provides empirical support for the emphasis on reciprocal determinism in Social Cognitive Theory, confirming that feedback-rich environments strengthen the translation of psychological states into effective performance. Finally, by combining individual-level, team-level, and organizational-level constructs into a holistic performance improvement framework, this study contributes to broader fields such as organizational behavior, educational leadership, and human resource development.

**Practical implications**

Based on the findings, higher vocational colleges should consider the following practical actions:

- Enrich job design by integrating curriculum development, teaching, and research into coherent workflows, linking work outputs to professional cluster and Double High Plan indicators, granting greater autonomy in curriculum innovation and project management, and establishing data-informed feedback dashboards.
- Strengthen competency development through dual pathways. Explicit skills, such as disciplinary knowledge and pedagogical techniques, should be developed through workshops and enterprise-based practice. Implicit skills, such as reflection, communication, and classroom management, should be strengthened through teaching logs, peer observation, and mentoring systems.
- Improve organizational support by providing dedicated funding for curriculum reform and platform upgrades, establishing transparent multi-dimensional evaluation systems, and creating a supportive organizational climate through recognition and well-being initiatives.
- Institutionalize feedback systems through semester-based instructional evaluations, structured peer observation, student engagement analytics, and real-time digital monitoring tools.
- Foster team cohesiveness by clearly defining team roles, encouraging project-based interdisciplinary collaboration, and aligning professional cluster goals with team performance indicators.

**Policy implications**

Based on the findings, policymakers should consider the following policy directions:

 Strengthen national " Double- Qualified Teacher" policies by embedding job design, competency development, organizational support, and feedback mechanisms as core standards in teacher leadership programs.

 Increase sustainable funding for vocational institutions, particularly non-urban and private colleges, to improve material resources and technological capacity.

 Integrate leadership development frameworks into institutional evaluation and accreditation systems, with emphasis on self-efficacy, team cohesiveness, and feedback cultures.

 Promote inter-college collaboration through government-supported regional platforms that facilitate the sharing of best practices among discipline leaders.

 Implement these strategies as an integrated management system in which job design, training, support, teamwork, and feedback mutually reinforce one another.

**Conclusion**

The performance of discipline leaders plays a crucial role in advancing the quality and effectiveness of higher vocational education, particularly within the context of ongoing educational reform in China. This study developed and validated a performance improvement model for discipline leaders in higher vocational colleges in Shandong Province. The findings demonstrate that job characteristics, competency, and organizational support significantly influence work performance, both directly and indirectly through self-efficacy and team cohesiveness, highlighting the combined importance of individual capability, organizational conditions, and team dynamics. In addition, team feedback strengthens the effects of self-efficacy and team cohesiveness on performance, emphasizing the role of continuous and constructive communication in enhancing leadership effectiveness. Overall, the study shows that improving discipline leaders' performance requires more than strengthening individual competency. It also requires meaningful work design, sustained organizational support, cohesive teamwork, and regular feedback mechanisms that enable individual and collective resources to be translated into stronger performance outcomes.

**Limitations and future research**

This study has several limitations. The scope was limited to Shandong Province, which may restrict generalizability. The reliance on self-reported data raises the possibility of common method bias. The cross-sectional design does not allow for causal inferences or dynamic observations over time. Future research should develop KPI-based multidimensional performance measurement systems integrating subjective perception measures with objective indicators such as curriculum development output, student outcomes, and research records, analyzed through longitudinal designs. Additionally, intervention studies based on the five mechanisms of team feedback— high-frequency feedback loops, self-efficacy training, professional reflection, data-informed feedback, and team cohesiveness-building—should be designed and evaluated using pretest–posttest experimental designs with t-tests and multi-source data to examine effectiveness and sustainability across different institutional contexts.

**Declaration of generative AI in scientific writing**

During the preparation of this manuscript, the authors used generative artificial intelligence tools solely for language editing and grammatical refinement. The authors subsequently reviewed and revised all AI-assisted content and take full responsibility for the accuracy, originality, interpretation, and integrity of the manuscript.

**CRediT author statement**

**Sun Xiaotong:** Conceptualization, Methodology, Data Curation, Formal Analysis, Writing – Original Draft. **Boonmee Nenyod:** Supervision, Validation, Writing – Review & Editing. **Lee Hsing Lu:** Supervision, Investigation, Writing – Review & Editing.

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