

focuses on quantitative analysis in Western contexts, lacking investigations into the localized mechanisms of central and western China (Zhang & Liu, 2021).

To fill this gap, this study integrates Social Cognitive Theory (Bandura, 1977) and Educational Innovation Theory to construct a unified framework. Grounded in Bandura's concept of triadic reciprocal determinism, we posit that individual (self-efficacy), organizational (leadership, culture), and behavioral (professional development) factors interact to influence innovative outcomes.

This study addresses two core research questions: (1) What is the causal model of university teachers' innovative ability in Shaanxi Province? (2) How does job satisfaction mediate this relationship? By answering these questions,

this paper aims to provide theoretical enrichment and practical guidelines for regional higher education reform.

2. Theoretical Framework and Hypotheses

This study establishes its conceptual framework based on the integration of Social Cognitive Theory (SCT) and Motivation-Hygiene Theory. Social Cognitive Theory (Bandura, 1977): This theory emphasizes the dynamic interplay between personal factors (e.g., self-efficacy), environmental factors (e.g., leadership, collaborative culture), and behavior (e.g., innovation ability). We argue that in the context of Shaanxi universities, teachers' self-efficacy (personal factor) is shaped by the organizational environment, which in turn drives innovative behavior. Motivation-Hygiene Theory (Herzberg, 1968): To explain the mediating role of job satisfaction, we draw on Herzberg's theory. We hypothesize that factors like leadership support (hygiene/motivator) and professional development opportunities influence teachers' job satisfaction, which subsequently bridges the gap between external support and actual innovative behavior. Based on this foundation, we propose a structural model where job satisfaction mediates the relationship

between antecedent variables (self-efficacy, leadership, etc.) and the outcome variable (innovation ability).

3. Materials and Methods

3.1 Research Design

A mixed-methods approach was employed, combining quantitative (survey) and qualitative (in-depth interview) methods to ensure comprehensive and rigorous results.

3.2 Population and Samples

Quantitative Sample: The target population was 83,643 university teachers in Shaanxi Province (Statistical Bulletin of Shaanxi Province's Education Development, 2023). Using stratified random sampling, 430 valid questionnaires were collected from 10 representative universities (5 public undergraduate, 3 private undergraduate, 2 vocational

colleges), covering disciplines such as English, Computer Science, Statistics, and Physics. Sample size was determined using G*Power 3.1 (effect size=0.20, power=0.90, $\alpha=0.05$) for structural equation modeling (Soper, 2024).

Qualitative Informants: 20 key informants were selected via purposive sampling, including human resource executives, teaching management staff, and teacher development center personnel from participating universities, to explore in-depth factors influencing innovation and promotion strategies.

3.3 Research Instruments

Questionnaire: Developed based on literature reviews and expert validation, the questionnaire included three parts: (1) demographic information (gender, school type, teaching subject, work experience); (2) exogenous variables (self-efficacy: 9 items, leadership: 6 items, collaborative culture: 7 items, teaching technology development: 8 items); (3) mediating variable (job satisfaction: 8 items); (4) endogenous variable (teachers' innovation ability: 8

demonstrating high internal consistency. Convergent validity was verified through factor loadings and average variance extracted (AVE). All observed variables had factor loadings above 0.70, indicating strong correlations between latent variables and their indicators. AVE values for all constructs were greater than 0.60, meeting the criterion of 0.50, which means the latent variables explained sufficient variance in their observed indicators. Discriminant validity was assessed using the Heterotrait-monotrait (HTMT) ratio, with all variable pairs showing HTMT values below 0.85, confirming that each latent variable is conceptually distinct from others. Overall, the measurement model exhibited excellent psychometric properties, laying a solid foundation for testing the structural relationships.

4.1.4 Structural Model Results

Direct effects analysis revealed that all four exogenous variables exerted significant positive impacts on teachers' innovation ability ($p < 0.01$). collaborative culture had the strongest direct effect ($\beta = 0.22$), followed by TPD ($\beta = 0.19$), while self-efficacy and leadership each had a direct effect of $\beta = 0.18$. This indicates that collaborative culture is the most impactful direct driver of teacher innovation, emphasizing the importance of collective knowledge sharing and mutual support in higher education contexts. job satisfaction also had a significant direct effect on teachers' innovation ability ($\beta = 0.19$, $p < 0.01$), confirming that teachers' emotional and psychological states toward their work directly influence their willingness and ability to innovate.

Mediating effects analysis showed that JS played a partial mediating role in all relationships between exogenous variables and teachers' innovation ability, (all $p < 0.01$). The indirect effect of leadership on teachers' innovation ability through job satisfaction was the strongest (0.050), followed by collaborative culture (0.041), teaching technology development (0.029), and self-efficacy (0.026). This suggests that

instructional leadership's influence on innovation is more dependent on improving teachers' job satisfaction compared to other factors. In terms of total effects (direct + indirect), collaborative culture maintained the highest total effect on teachers' innovation ability ($\beta = 0.22$), followed by self-efficacy ($\beta = 0.21$), teaching technology development ($\beta = 0.19$), and leadership ($\beta = 0.18$). These results confirm the multi-path influence mechanism of teacher innovation, where individual, organizational, and technological factors act both directly and indirectly through job satisfaction.

4.2 Qualitative Findings and Integrated Discussion

Thematic analysis of interview data yielded five key themes that complement and explain the quantitative results, providing a holistic understanding of teacher innovation mechanisms in Shaanxi Province.

First, self-efficacy serves as a psychological foundation for innovation. Teachers with high self-efficacy were more willing to experiment with new teaching methods and tolerate temporary failures, while those with low self-efficacy often avoided innovation due to technological anxiety or fear of negative student evaluations. This aligns with Bandura's (1977) self-efficacy theory, which posits that individuals' beliefs in their capabilities directly influence behavioral choices and persistence. The quantitative finding of self-efficacy's significant direct effect ($\beta = 0.18$) is thus supported by qualitative evidence, highlighting the need to strengthen teachers' psychological confidence through targeted training and positive feedback.

Second, leadership acts as an organizational driver of innovation. Supportive leadership behaviors, such as resource allocation for innovative projects, tolerance for trial and error, and clear communication of innovation priorities, significantly enhanced teachers' motivation. However, interviewees noted that overemphasis on research performance in promotion and evaluation

systems often diverted teachers' energy away from teaching innovation, which may explain why leadership's total effect ($\beta=0.18$) was not the strongest among exogenous variables. This finding echoes Leithwood and Louis's (2020) argument that instructional leadership must align institutional policies and values to foster sustainable innovation.

Third, collaborative culture functions as a catalyst for innovation. Trust, effective communication, and interdisciplinary collaboration were repeatedly mentioned as key enablers of creative teaching practices, such as joint curriculum design and cross-departmental teaching workshops. In contrast, professional isolation limited innovation diffusion, as teachers lacked opportunities to share ideas and learn from peers. The quantitative result of collaborative culture's strongest direct effect ($\beta=0.22$) is consistent with this qualitative insight, confirming that innovation in higher education is inherently a collective endeavor (Rhoten & Parker, 2004).

Fourth, teaching technology development serves as an enabler of innovation. Systematic training in digital tools and blended learning methods expanded teachers' innovative capabilities, allowing them to translate creative ideas into practical instructional strategies. However, resource disparities between public and private universities, as well as between undergraduate and vocational institutions, created implementation barriers for some teachers. This explains why teaching technology development's direct effect ($\beta=0.19$) was substantial but not the strongest, as technological access and training quality are uneven across the region. The finding reflects the growing importance of digital literacy in modern education (Redecker & Punie, 2017) and the need for equitable technological development in higher education.

Fifth, job satisfaction acts as a motivational bridge linking external support to innovation. Fair compensation, clear career development pathways, and work-life balance strengthened teachers' commitment to innovative practices, while heavy administrative workloads and inadequate

recognition of teaching innovation reduced engagement. The quantitative finding of job satisfaction's significant mediating role (indirect effects ranging from 0.026 to 0.050) is strongly supported by these qualitative insights, confirming Herzberg's (1968) motivation-hygiene theory. Job satisfaction transforms structural support and individual capabilities into sustained innovative behavior, addressing a gap in previous research by highlighting the emotional and motivational mechanisms of innovation (Judge et al., 2001).

Integrating quantitative and qualitative findings, this study confirms that university teachers' innovative ability in Shaanxi Province is shaped by a synergistic system of individual psychological factors (self-efficacy), organizational support (leadership), collaborative environments (collaborative culture), technological empowerment (teaching technology development), and motivational mediation (job satisfaction). No single factor alone determines innovation; instead, their interplay creates the conditions for creative teaching practices. This integrated model enriches educational innovation theory with localized evidence from central and western China, moving beyond Western-centric frameworks to address regional contexts and challenges.

4.3 Figures and Tables

As per request, no tables are included; key quantitative relationships are presented in the text above. A conceptual figure illustrating the causal model is recommended for conference presentation, depicting the direct effects of self-efficacy, leadership, collaborative culture, teaching technology development on teachers' innovation ability, and the mediating role of job satisfaction.

5. Conclusion

This study constructs and validates a comprehensive causal model of university teachers' innovative ability in Shaanxi Province, systematically examining the direct effects of

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My name is Teng Chanjuan. I am currently pursuing a Ph.D. in Educational Administration at Southeast Asia University, Thailand, with a research focus on higher education innovation. I have

long been interested in various factors influencing university teachers' innovation ability. This study, centered on the theme "The Causal Model of Teacher Innovative Ability of University in Shaanxi Province," aims to identify the mechanisms through which individual, organizational, and contextual factors influence teachers' innovation ability, and based on this, explore evidence-based methods to enhance their innovative potential. Ultimately, this research aims to provide greater support for university teachers in pursuing innovative practices and offer practical guidance for educational institutions and policymakers seeking to cultivate innovative cultures in higher education.