# Transformational Leadership and Faculty Innovative Behavior in Chinese Vocational Institutions: A Moderated Mediation Model

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**ABSTRACT:**

While transformational leadership (TL) is a recognized catalyst for innovative work behavior (IWB), research has not sufficiently examined whether this relationship holds in resource-constrained, non-Western educational settings. This omission is consequential, as the behavioral expression of work motivation may be contingent on resource availability. Drawing on self-determination theory (SDT) and conservation of resources (COR) theory, this study examined a moderated mediation model positing that psychological empowerment (PE) mediates the TL–IWB relationship, and that this indirect effect is contingent on perceived resource constraints (PRC). Survey data from 431 full-time faculty across 12 vocational institutions in Guangxi, China, were analyzed using structural equation modeling with cluster-robust standard errors and latent moderated structural equations, supplemented by an equivalence test to validate the key null finding. TL was positively associated with both PE and IWB. PE partially mediated the TL–IWB link (indirect effect = 0.16, 95% CI [0.07, 0.29]), accounting for 36.4 percent of the total effect. PRC significantly moderated the PE→IWB path ($\beta = -.19$, *$p$* = .003); the indirect effect was reduced by 61 percent under high resource constraints. The TL→PE path remained non-contingent on resource conditions and was statistically equivalent to zero via equivalence

testing. This asymmetric pattern—a resource-insensitive motivational pathway and a resource-fragile behavioral pathway—reveals a phenomenon of motivational-behavioral decoupling in resource-scarce environments. Leadership development and adequate resourcing function as complementary mechanisms; the 61 percent attenuation under high constraints demonstrates that resource scarcity constrains the translation of leadership-induced motivation into innovative action.

Keywords: contingent process, motivational-behavioral decoupling, perceived resource constraints, psychological empowerment, transformational leadership

**Introduction**

The question of how and under what conditions transformational leadership fosters faculty innovative behavior in resource-constrained vocational education settings remains unresolved. This question is pressing in contexts where institutional resource endowments—equipment, time, funding, and support staff—constitute binding constraints on faculty action, shaping the opportunity structures within which innovation occurs (Tilak, 2020; UNESCO-UNEVOC, 2022). Faculty IWB—the intentional generation, promotion, and realization of novel ideas to improve teaching and institutional practices (Janssen, 2000; Scott & Bruce, 1994)—is increasingly recognized as a driver of institutional adaptation and educational quality. However, the majority of empirical research on the antecedents of faculty IWB has been conducted in resource-rich, Western higher education settings (Hammond et al., 2011; Wang et al., 2011). The translation of these findings to resource-constrained, non-Western vocational contexts remains problematic. In Chinese vocational institutions, where dual-qualification teacher ratios average 32 percent against a 50 percent national target (Guangxi Education Department, 2023), the gap between reform mandates and institutional capacity makes this an empirically relevant site for examining how resource scarcity moderates the leadership–innovation nexus.

Existing research on TL and IWB in educational settings has predominantly focused on direct effects and simple mediation models (Hallinger, 2003; Leithwood & Jantzi, 2005), leaving three gaps unresolved. First, while SDT (Deci & Ryan, 2000) suggests that TL fosters IWB through PE, SDT's organismic-dialectical proposition—that the behavioral expression of autonomous motivation is contingent on environmental affordances (Deci et al., 2017; Ryan & Deci, 2017)—has received limited quantitative scrutiny in non-Western educational contexts. Second, COR theory (Hobfoll, 2001) predicts that resource scarcity attenuates motivational translation, yet prior theoretical integrations of SDT and COR (e.g., Fernet et al., 2012; Van den Broeck et al., 2008) have focused on burnout and engagement, leaving the TL–PE–IWB process with a resource-based contingency untested. Third, Guangxi—China's only province with land and sea connections to the Association of Southeast Asian Nations (ASEAN)—provides a theoretically relevant

setting. As a border province with the lowest GDP per capita in China and a structural "reform-resource mismatch" in its vocational system, Guangxi represents an informative case for theoretical sampling (Eisenhardt, 1989; Yin, 2018)—an extreme, information-rich context where the hypothesized resource-contingent mechanism should be most salient. The ASEAN connection introduces a dual-edged contextual condition: cross-border partnerships may serve as alternative resource channels, yet simultaneously impose additional cooperation demands.

The integration of SDT and COR points to a specific pattern of asymmetry: the motivational pathway through TL may be resource-insensitive, while its translation into innovative behavior may be resource-fragile. This study conceptualizes this asymmetric pattern as motivational-behavioral decoupling—a phenomenon capturing the resource-contingent breakdown in the motivation-to-action chain. Although this premise of SDT theoretically implies such decoupling, it has not been empirically quantified. By operationalizing decoupling as the difference between the resource-invariant TL→PE path and the resource-contingent PE→IWB path, this study provides a testable framework for understanding why empowered faculty may not innovate under resource scarcity. This study does not directly measure cultural values such as power distance but acknowledges their potential influence as an interpretive lens (Liden & Antonakis, 2009; Oc, 2018).

To address these gaps, the present study integrates SDT and COR theory to examine a moderated mediation model in which PE mediates the TL–IWB relationship, and PRC moderate the PE→IWB pathway. Using survey data from 431 faculty across 12 vocational institutions in Guangxi, the study tests six hypotheses regarding the direct, indirect, and conditional effects of TL on faculty IWB. The research questions map directly to the hypotheses: RQ1 (mediation) corresponds to H2, H3, and H4; RQ2 (moderation) corresponds to H5 and H6; RQ3 (institutional differences) is exploratory and does not correspond to a formal hypothesis—its findings are reported as post-hoc. The term "path" denotes the statistical association in the structural model, not an empirical temporal claim; the cross-sectional data test the statistical structure of this sequence, not its temporal dynamics.

This study contributes to the literature in three ways. First (contextual), it provides an empirical test of SDT's organismic-dialectical premise in a non-Western, resource-constrained vocational education context, quantifying the attenuation of the PE→IWB relationship under high PRC. Second (theoretical), it advances the integration of SDT and COR by demonstrating that motivational pathways (TL→PE) and motivational expression (PE→IWB) follow different resource contingencies—a pattern conceptualized as motivational-behavioral decoupling. Third (methodological), it employs latent moderated structural equations (LMS) with cluster-robust standard errors, supplemented by an equivalence test (TOST) to provide rigorous statistical support for the key null finding. The TOST procedure confirms that the TL→PE path is not merely non-significant but practically equivalent to zero in its resource contingency.

## Theoretical Framework and Hypothesis Development

This section establishes the theoretical logic that directly generates all six hypotheses, consolidating

SDT and COR into a single coherent argument. Table 1 presents the operational definitions of all key constructs; the text below focuses on theoretical relationships.

**Table 1** Operationalization of Key Constructs

| Construct | Definition | Dimensions | Measurement Source |
|---|---|---|---|
| TL | Leadership that inspires followers to transcend self-interest through idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration | Idealized influence, Inspirational motivation, Intellectual stimulation, Individualized consideration | Bass (1985); MLQ-5X (Bass & Avolio, 1995) |
| PE | A cognitive-motivational state characterized by meaning, competence, self-determination, and impact | Meaning, Competence, Self-determination, Impact | Spreitzer (1995) |
| IWB | Intentional generation, promotion, and realization of novel ideas to improve teaching and institutional practices | Idea generation, Idea promotion, Idea realization | Janssen (2000); Scott & Bruce (1994) |
| PRC | Perceived scarcity of resources needed to support innovative activities | Equipment, Time, Funding, Support staff | Peters & O'Connor (1980); adapted for this study |

*Note.* TL = Transformational Leadership; PE = Psychological Empowerment; IWB = Innovative Work Behavior; PRC = Perceived Resource Constraints. All constructs were measured using established multi-item scales as described in the Methodology section.

*Transformational Leadership and Faculty IWB: The Role of Psychological Empowerment*

Transformational leadership inspires followers to transcend self-interest through idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration (Bass, 1985). In educational settings, TL has been linked to teacher commitment and pedagogical innovation (Leithwood & Jantzi, 2005). SDT posits that individuals have innate psychological needs for autonomy, competence, and relatedness (Ryan & Deci, 2017). Leaders exhibiting transformational behaviors satisfy these needs, cultivating PE—a cognitive-motivational state characterized by meaning, competence, self-determination, and impact (Spreitzer, 1995). Empirical research confirms that PE mediates the TL–innovation link (Jaiswal & Dhar, 2017; Khany & Tazik, 2019).

The logical sequence of hypotheses proceeds as follows: TL cultivates PE (H2); PE promotes IWB (H3); therefore, PE mediates the TL–IWB relationship (H4). H1 (TL→IWB direct effect) is retained as a baseline test of the total effect—not as a theoretical prerequisite for H2-H4, but as a benchmark against which the indirect, resource-contingent model can be evaluated. The direct effect is expected because TL may influence IWB through mechanisms beyond PE—such as inspirational vision articulation, intellectual stimulation, and role modeling of innovative behaviors (Bass, 1985; Wang et al., 2011). Prior studies on the TL-PE-IWB relationship (Jaiswal &

Dhar, 2017; Khany & Tazik, 2019) have been conducted in organizational settings where resource availability was not a binding constraint. The generalizability of their findings to resource-scarce vocational contexts remains unknown. Accordingly, H1: Transformational leadership is positively associated with faculty innovative work behavior. H2: Transformational leadership is positively associated with psychological empowerment. H3: Psychological empowerment is positively associated with faculty innovative work behavior. H4: Psychological empowerment mediates the relationship between transformational leadership and innovative work behavior.

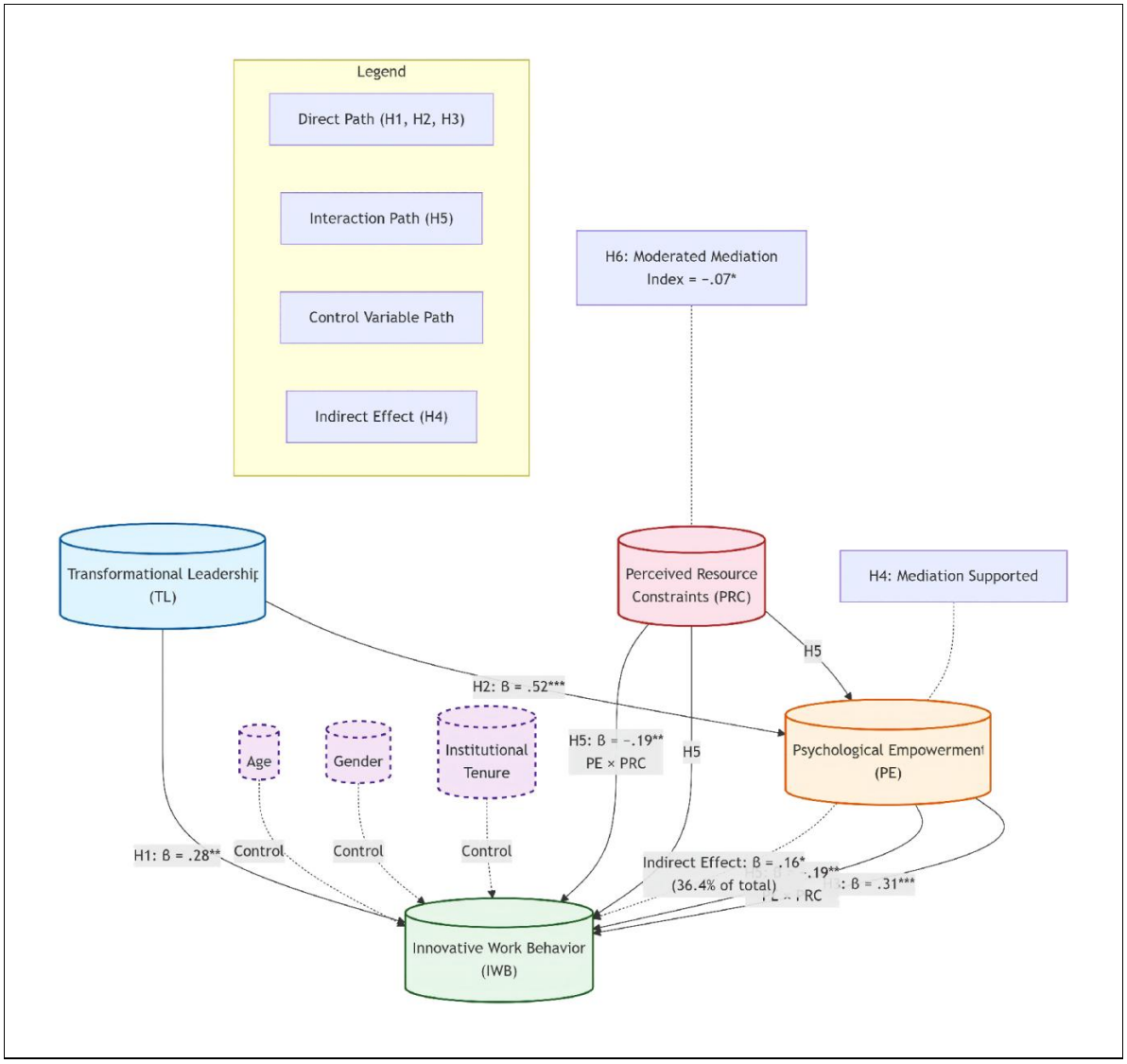
*The Contingent Process: Integrating SDT and COR*

The central theoretical innovation of this study lies in specifying the boundary condition for the PE→IWB translation. SDT's organismic-dialectical premise holds that the energizing effect of autonomous motivation is expressed only when environmental affordances permit (Deci et al., 2017). COR theory specifies what constitutes a meaningful affordance: the availability of resources (Hobfoll, 2001). A conceptual clarification is warranted here: COR theory's loss spiral has been primarily tested in contexts of acute objective resource loss, whereas this study examines perceived constraints. Perceived constraints are theoretically sufficient to trigger COR's loss spiral because the perception of scarcity activates the same defensive resource calculus as objective loss, particularly when institutional mandates create anticipatory resource demands. When resources are perceived as scarce, individuals adopt defensive postures to conserve remaining resources, making them less willing to invest in resource-depleting activities such as innovation.

The two theories are integrated as a contingent process: SDT explains the motivational pathway (TL→PE), while COR explains the resource-based conditions under which this energy is translated into action (PE→IWB). This logic generates a clear empirical prediction: the PE→IWB path should be moderated by PRC, and consequently, the indirect effect of TL on IWB via PE should be conditional on PRC levels. The integrated framework also predicts that the TL→PE path should be non-contingent on resource conditions, as basic psychological need satisfaction can occur regardless of contextual resources (Ryan & Deci, 2017).

The relationship between H5 and H6 requires clarification. H5 tests the path-level interaction (PE×PRC→IWB). H6 tests the conditional indirect effect (TL→PE→IWB at varying PRC levels). H6 is not an independent hypothesis but a statistical derivation of H5—its inclusion is for effect-size quantification, not conceptual independence. Hence, H5: Perceived resource constraints moderate the positive relationship between psychological empowerment and innovative work behavior, such that the relationship is weaker when perceived resource constraints are high. H6: The indirect effect of transformational leadership on innovative work behavior through psychological empowerment is moderated by perceived resource constraints (moderated mediation). Figure 1 presents the proposed model.

**Figure 1** Proposed Moderated Mediation Model




## Methodology

This section provides transparent and replicable procedures for testing contingent processes.

*Participants and Procedure*

A quantitative cross-sectional survey design was employed. Data were collected from 12 accredited vocational undergraduate institutions in Guangxi, China, during September–October 2024. Institutions were purposively selected based on four criteria: accreditation status, involvement in provincial reform initiatives, geographical diversity (urban/rural), and institutional type (key *vs.* general) to enable exploratory comparisons. The 12 institutions included comprehensive vocational universities and specialized technical colleges, with student enrollments ranging from 3,000 to 15,000.

Of 1,180 full-time faculty invited, 472 returned completed questionnaires (40.0 percent response rate). After excluding 41 cases (8.7 percent) due to substantial missing data (>15 percent incomplete), multivariate outliers (Mahalanobis distance exceeding critical $\chi 2$ at $*p* < .001$), and patterned responding, the final sample comprised 431 cases.

Final institution-level sample sizes ranged from 24 to 45 ($M$ = 35.9, $SD$ = 6.2), with the excluded 41 cases distributed proportionally across institutions—no institution lost more than 15 percent of its initial respondents. Little's MCAR test confirmed no systematic missing patterns ($\chi 2$ = 98.42, $df$ = 86, $p$ = .17). The sample was 45.2 percent male, mean age 38.47 years ($SD$ = 9.63), mean tenure 7.82 years ($SD$ = 5.41). Educational attainment: 26.0 percent bachelor's, 61.0 percent master's, 13.0 percent doctoral. Academic ranks: teaching assistant (18.1 percent), lecturer (47.6 percent), associate professor (24.6 percent), professor (9.7 percent). Table 2 presents the full demographic profile.

**Table 2** Demographic Profile of Participants ($N$ = 431)

| Demographic Variables | Categories | *n* | % |
|---|---|---|---|
| Gender | Male | 195 | 45.2 |
| | Female | 236 | 54.8 |
| Age (years) | 25-34 | 187 | 43.4 |
| | 35-44 | 149 | 34.6 |
| | 45-54 | 76 | 17.6 |
| | 55+ | 19 | 4.4 |
| Highest Degree | Bachelor | 112 | 26 |
| | Master | 263 | 61 |
| | Doctorate | 56 | 13 |
| Academic Rank | Teaching Assistant | 78 | 18.1 |
| | Lecturer | 205 | 47.6 |
| | Associate Professor | 106 | 24.6 |
| | Professor | 42 | 9.7 |
| Tenure | < 3 years | 103 | 23.9 |
| | 3-7 years | 164 | 38.1 |
| | 8-15 years | 98 | 22.7 |
| | >15 years | 66 | 15.3 |
| Discipline | Engineering & Technology | 152 | 35.3 |
| | Business & Management | 118 | 27.4 |
| | Humanities & Arts | 85 | 19.7 |
| | Other | 76 | 17.6 |

For post-hoc exploratory analysis, institutions were categorized as key (*$n$* = 6, 213 faculty) and general (*$n$* = 6, 218 faculty) based on official "Double-High Plan" designations (Ministry of Education & Ministry of Finance, 2019). This classification serves as a proxy for differential resource endowments; no independent objective resource measures were collected.

*Data Collection and Instruments*

Data were collected through an anonymous online survey using www.wjx.cn. Several procedural remedies recommended by Podsakoff et al. (2003) were implemented to mitigate common method bias. Participants were assured of response anonymity and confidentiality. The items measuring predictor and criterion variables were placed in separate survey sections with distinct instructions. The order of items within each scale was randomized, and participants were explicitly encouraged to respond honestly, with no right or wrong answers. All latent constructs were measured using multi-item 5-point Likert scales (1 = strongly disagree to 5 = strongly agree).

TL was measured using the 20-item Multifactor Leadership Questionnaire Form 5X (MLQ-5X; Bass & Avolio, 1995), modeled as a second-order construct with four dimensions: idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration. A sample item is: "My leader articulates a compelling vision of the future." Cronbach's alpha for the scale was .93. PE was assessed using Spreitzer's (1995) 12-item scale, with four dimensions: meaning, competence, self-determination, and impact. Items were aggregated into four parcels corresponding to these theoretical dimensions. A sample item is: "The work I do is very important to me." The scale demonstrated strong internal consistency (α = .91). IWB was evaluated using a 9-item scale adapted from Janssen (2000) for the educational setting. The scale captures three aspects (idea generation, promotion, and realization), each measured by three items. A sample item is: "I generate original solutions for problems encountered in my teaching practice." Cronbach's alpha was .93.

PRC was measured using a 4-item scale adapted from the Organizational Constraints Scale (Peters & O'Connor, 1980). The items assess four resources: teaching equipment and facilities, time for innovation, funding for pedagogical experimentation, and support staff availability. These dimensions were informed by a prior qualitative exploration: semi-structured interviews with 15 faculty members from three institutions, followed by thematic analysis that identified four saturated resource categories. All items were reverse-coded such that higher scores indicated greater perceived constraints. The scale yielded a Cronbach's alpha of .87.

Content validity for all adapted instruments was established through a two-stage expert review process. Five experts—three in educational leadership and two in psychometrics—rated each item for relevance, clarity, and domain representativeness. Item-level content validity indices (I-CVI) ranged from .80 to 1.00, and the scale-level content validity index (S-CVI/Ave) was .92. A back-translation procedure (Brislin, 1970) ensured linguistic equivalence. A pilot study ($N$ = 42, two institutions, not in the main sample) confirmed acceptable internal consistency for all scales (Cronbach's α = .89–.94).

*Data Analysis*

Analyses proceeded in four stages using SPSS 28.0 and Mplus 8.10 (Kline, 2016). First, descriptive statistics and correlations were computed. Second, confirmatory factor analysis (CFA) tested the measurement model against plausible alternatives (Satorra–Bentler scaled χ2 difference test). Third, SEM with the MLR estimator and TYPE = COMPLEX procedure (Muthén & Satorra, 1995) computed cluster-robust standard errors (intraclass correlation coefficient [ICC] for IWB = .06; design

effect [DEFF] = 3.09). The DEFF value, combined with the relatively small number of clusters (*k* = 12), supports the use of single-level SEM with cluster-robust standard errors rather than full multilevel structural equation modeling (McNeish & Stapleton, 2016). Fourth, moderated mediation was tested using 95 percent bias-corrected bootstrap CIs (5,000 resamples) with the LMS approach in Mplus (Preacher et al., 2007). LMS was selected due to its established performance with moderate cluster counts and its capacity to produce efficient estimates of latent interactions within a frequentist framework (Klein & Moosbrugger, 2000).

To provide a statistically rigorous test for the key null hypothesis—that PRC does not moderate the TL→PE path—an equivalence test was conducted using the TOST procedure. The equivalence zone was set at a standardized coefficient of ±.10, representing the smallest effect size of practical significance for a moderation effect in this research context (Cohen, 1988). This bound was selected because a moderation effect below .10 is unlikely to translate into practically meaningful differences in conditional indirect effects. The TOST procedure serves not merely as a methodological tool but as a component of the theoretical argument. A post-hoc Monte Carlo power analysis indicated that with $N = 431$ and $\alpha = .05$, the study had 82 percent power to detect a moderation effect of $\beta = .10$, exceeding the conventional 80 percent threshold.

Common method variance (CMV) was assessed via a latent common method factor model (negligible improvement: ΔCFI = .006; ΔRMSEA = .003) and Harman's single-factor test (first factor accounted for 26.38 percent of variance), suggesting CMV does not pose a serious threat (Podsakoff et al., 2003). Age, gender, and institutional tenure were included as control variables in the structural model; none significantly predicted IWB.

*Ethical Considerations*

Ethical approval was obtained from the Institutional Review Board of the institution with which the authors are affiliated. Informed consent was obtained from all participants.Informed consent was obtained from all participants prior to their involvement, after providing them with detailed information about the study's purpose, procedures, and their rights. Participants were informed of the voluntary nature of participation and their right to withdraw at any time without consequence. All responses were anonymized at the point of data collection.

**Results**

*Measurement Model*

Table 3 presents CFA results. The hypothesized four-factor model demonstrated good fit: $\chi^2(41) = 60.27$, $*p* = .026$, $\chi^2/df = 1.47$, CFI = .97, TLI = .97, RMSEA = .03 [90% CI: .01, .05], SRMR = .03. All factor loadings were significant ($*p* < .001$; range .78–.91). Composite reliability (CR) exceeded .83, AVE exceeded .62, supporting convergent validity (Fornell & Larcker, 1981). Table 4 shows that square roots of AVE exceeded inter-construct correlations, supporting discriminant validity. The hypothesized four-factor model demonstrated superior fit compared to all alternative models using Satorra–Bentler scaled chi-square difference tests: three-factor model combining PE and IWB (Satorra–Bentler scaled $\Delta\chi^2 = 287.45$, $\Delta df = 3$, $*p* < .001$), two-factor model combining TL, PE, and IWB (SB-$\Delta\chi^2 = 642.18$, $\Delta df = 5$, $*p* < .001$), and single-factor model (SB-$\Delta\chi^2 = 1{,}243.62$, $\Delta df = 6$, $*p* < .001$).

**Table 3** Confirmatory Factor Analysis Results

| Construct | CR | AVE | α | Factor Loading Range |
|---|---|---|---|---|
| TL (Second-order) | .93 | .72 | .93 | 0.83–0.90 |
| PE (Second-order) | .91 | .72 | .91 | 0.80–0.88 |
| IWB | .93 | .78 | .93 | 0.84–0.91 |
| PRC | .87 | .63 | .87 | 0.78–0.85 |

*Note.* CR = composite reliability; AVE = average variance extracted; α = Cronbach's alpha. All loadings significant at *$p$* < .001.

**Table 4** Discriminant Validity (Square Roots of AVE on Diagonal)

| Variable | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| 1. TL | (.85) | | | |
| 2. PE | .22*** | (.85) | | |
| 3. IWB | .40*** | .35*** | (.88) | |
| 4. PRC | −.15** | −.18*** | −.21*** | (.79) |

*Note.* **$p$* < .01. ***$p$* < .001.

*Descriptive Statistics and Correlations*

Table 5 presents means, SDs, and correlations. All variables showed moderate means (3.17–3.27) and adequate variability (*SD* .68–.81). TL correlated positively with IWB (*$r$* = .40) and PE (*$r$* = .22). PE correlated positively with IWB (*$r$* = .35). PRC correlated negatively with PE (*$r$* = −.18) and IWB (*$r$* = −.21). Kolmogorov-Smirnov tests confirmed no significant distributional differences between key and general institution groups for any variable (D = .06–.11, all *$p$* > .05).

**Table 5** Descriptive Statistics and Correlations (*N* = 431)

| Variable | *M* | *SD* | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|
| 1. TL | 3.24 | .76 | — | | | |
| 2. PE | 3.19 | .68 | .22*** | — | | |
| 3. IWB | 3.27 | .74 | .40*** | .35*** | — | |
| 4. PRC | 3.17 | .81 | −.15** | −.18*** | −.21*** | — |

*Note.* **$p$* < .01. ***$p$* < .001.

*Hypothesis Testing*

Table 6 reports structural model results. The model explained 31 percent of variance in PE and 43 percent in IWB. Main effects and mediation (H1–H4) were all supported: TL→IWB ($\beta$ = .28, *SE* = .08, 95% CI [.12, .44], *$p$* = .001); TL→PE ($\beta$ = .52, *SE* = .05, 95% CI [.42, .62], *$p$* < .001); PE→IWB ($\beta$ = .31, *SE* = .07, 95% CI [.17, .45], *$p$* < .001). The indirect effect (TL→PE→IWB) was significant ($\beta$ = .16, *SE* = .06, 95% CI [.07, .29]), accounting for 36.4 percent of the total effect. The PE × PRC interaction was significant ($\beta$ = −.19, *SE* = .06, 95% CI [−.31, −.07], *$p$* = .003, $\Delta R^2$ = .04, *$f^2$* = .06), supporting moderation (H5). Simple slope analysis (Figure 2) revealed that the PE–IWB relationship

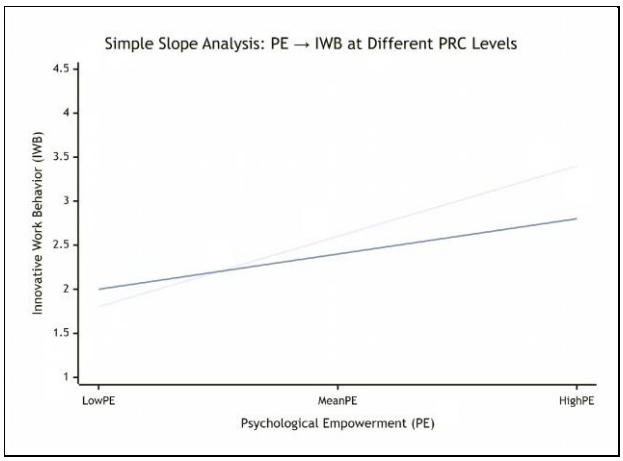
was stronger under low PRC (−1 *SD*: $\beta$ = .46, **p** < .001) and weaker under high PRC (+1 *SD*: $\beta$ = .16, **p** = .042). The index of moderated mediation (H6) was significant (index = −.07, *SE* = .03, 95% CI [−.14, −.02]). The conditional indirect effect was $\beta$ = .18 (*SE* = .06, 95% CI [.08, .30]) under low PRC and $\beta$ = .07 (*SE* = .04, 95% CI [.01, .14]) under high PRC—a reduction of 61 percent. The TL × PRC → PE interaction was non-significant ($\beta$ = .04, **p** = .423). The subsequent equivalence test (TOST) was significant (**p** < .05), with the 90 percent confidence interval [−.04, .12] entirely within the pre-defined ±.10 equivalence bound, confirming that the first-stage interaction effect was statistically equivalent to zero and practically negligible in its resource contingency. This confirms that the TL→PE path is resource-insensitive (non-contingent) in this sample.

**Table 6** Structural Model Results (*N* = 431)

| Hypothesis / Path | $\beta$ | B | *SE* | 95% CI | **p** | Supported |
|---|---|---|---|---|---|---|
| H1: TL → IWB | .28 | .31 | .08 | [.12, .44] | .001 | Yes |
| H2: TL → PE | .52 | .47 | .05 | [.42, .62] | < .001 | Yes |
| H3: PE → IWB | .31 | .35 | .07 | [.17, .45] | < .001 | Yes |
| H4: TL→PE→IWB | .16 | .16 | .06 | [.07, .29] | — | Yes |
| H5: PE×PRC→IWB | −.19 | −.22 | .06 | [−.31, −.07] | .003 | Yes |
| Low PRC (−1 SD) | .18 | .18 | .06 | [.08, .30] | — | — |
| High PRC (+1 SD) | .07 | .08 | .04 | [.01, .14] | — | — |
| H6: Index | −.07 | −.05 | .03 | [−.14, −.02] | — | Yes |
| TL × PRC → PE | .04 | .05 | .06 | [−.08, .16] | .423 | n.s. |
| Equivalence Test (TOST) | — | — | — | 90% CI [−.04, .12] | < .05 | Equivalent |

*Note.* $\beta$ = standardized; B = unstandardized; *SE* = cluster-robust; CI = bias-corrected bootstrap (5,000 resamples). Model $R^2$: PE = .31; IWB = .43. Equivalence zone set at ±.10 for the first-stage interaction. Age, gender, and institutional tenure included as controls; none significantly predicted IWB.

**Figure 2** Simple Slope Analysis of the Interactive Effect of Psychological Empowerment and Perceived Resource Constraints on Innovative Work Behavior




**Post-Hoc Exploratory Analyses**

Regarding dimensions of PE, meaning ($\beta$ = .06, 95% CI [.02, .12]), competence ($\beta$ = .05, 95% CI [.01, .10]), and self-determination ($\beta$ = .04, 95% CI [.01, .09]) were significant mediators while impact was not ($\beta$ = .01, 95% CI [−.02, .05]). On

institutional comparison (key *vs.* general), Mann-Whitney U tests showed that faculty in key institutions reported significantly higher TL ($M$ = 3.42 *vs.* 3.06, Z = −3.842, *$p$* < .001, *$r$* = .185), PE ($M$ = 3.38 *vs.* 3.00, Z = −4.126, *$p$* < .001, *$r$* = .199), and IWB ($M$ = 3.45 *vs.* 3.09, Z = −3.956, *$p$* < .001, *$r$* = .190). PRC did not differ significantly between key and general institutions ($M$ = 3.11 *vs.* 3.23, Z = −0.842, *$p$* = .400). This non-significant finding challenges the foundational assumption of policy designation as a mechanism for resource allocation—suggesting that "flagship" designation alone does not translate into perceived resource adequacy.

**Discussion**

This section interprets the empirical results through the lens of the three contributions stated in the Introduction, without repeating data already reported in Results.

*Principal Findings and Theoretical Contributions*

A question for interpreting these findings concerns whether this study merely replicates an established mediation model in a new context or advances theoretical understanding. The 61 percent attenuation of the indirect effect provides the basis for distinguishing replication from theoretical extension. If the TL-PE-IWB model were universally applicable, the indirect effect should be stable across resource conditions. The observed 61 percent attenuation demonstrates that this is not the case—the model's predictive validity is contingent on resource availability. This is not a mere replication; it is a specification of the model's boundary condition. The empirical partitioning of motivational pathway (resource-insensitive) and behavioral expression (resource-fragile) further distinguishes this study from prior applications.

The findings demonstrate that while TL is positively associated with psychological empowerment irrespective of resources ($\beta$ = .52, with the TL×PRC→PE path statistically equivalent to zero via TOST), this motivational energy becomes decoupled from innovative action under perceived resource scarcity. This asymmetric pattern—a non-contingent first stage and a resource-fragile second stage—empirically validates the phenomenon of motivational-behavioral decoupling in resource-scarce environments. The 61 percent attenuation of the indirect effect and the statistically equivalent-to-zero first-stage moderation provide evidence for a contingent process perspective.

This study advances theory in three interconnected ways. First, by demonstrating that PE mediates the TL–IWB relationship and that this indirect effect is attenuated by 61 percent under high PRC, the study provides quantitative evidence for SDT's organismic-dialectical premise in a non-Western vocational education context. The selection of Guangxi as an informative case—an extreme context where the mechanism should be most observable—means that the observed 61 percent attenuation likely represents a conservative estimate of the boundary effect under more typical conditions. The TL→PE path ($\beta$ = .52) paired with the resource-contingent PE→IWB translation ($\beta$ = −.19 interaction) confirms that motivational pathways and behavioral expression follow different logics—a core tenet of SDT that has been theorized but rarely empirically partitioned (Deci et al., 2017; Gagné & Deci, 2005).

Second, the significant second-stage moderation (H5), the non-significant first-stage moderation confirmed by equivalence testing, and the resulting pattern of motivational-behavioral decoupling

together validate the contingent process integration of SDT and COR. This precise empirical partitioning of the two theories' explanatory domains constitutes the study's central theoretical contribution. The concept of motivational-behavioral decoupling translates SDT's abstract organismic-dialectical premise into an empirically testable, domain-specific proposition. This conceptual operation—transforming a theoretical premise into a measurable construct—is itself a form of theoretical contribution, as it provides the empirical foundation for testing the premise's boundary conditions.

The resource loss spiral (Hobfoll, 2001) does not prevent leaders from cultivating empowerment, but it does prevent empowered faculty from acting on that empowerment when constraints are perceived as severe. This logic—"SDT generates, COR gates"—represents a distinct integration logic. The theoretical significance of this integration operates on three levels. First, it revises SDT's "universal applicability" assumption: the organismic-dialectical premise is not a uniform process—motivation pathways are resource-insensitive, but their channeling into resource-consumptive behaviors is resource-fragile. Second, it extends COR theory's scope: the loss spiral applies not only to objective resource loss but also to perceived resource constraints that prevent the deployment of already-generated psychological resources. Third, it reframes the motivation–behavior model as a conditional rather than universal sequence. Prior SDT-COR integrations (Fernet et al., 2012; Van den Broeck et al., 2008) focused on burnout, where need frustration leads to resource depletion. The present study reverses this dynamic: need satisfaction (through TL) generates motivational resources (PE), but COR's loss spiral prevents their deployment when resource scarcity signals that investment carries unacceptable risk. This reversal shifts the theoretical question from 'whether motivation translates into behavior' to 'under what conditions motivation translates into behavior.'

Third, the non-significant mediation through the "impact" dimension of PE reflects the institutional reality of centralized, hierarchical educational systems (Hofstede, 2001; Kirkman et al., 2009). In Chinese vocational institutions, where governance is top-down, faculty may perceive influence over organizational outcomes as beyond their legitimate role, regardless of psychological empowerment. Given that power distance was not directly measured, this interpretation remains speculative and awaits empirical verification.

*Practical Implications*

Two practical implications follow. First, the 61 percent attenuation under high constraints carries a clear message: leadership development and resource provision are complementary, not substitutable, strategies. Institutions implementing TL training must simultaneously conduct resource audits to address gaps in equipment, time allocation, and support staff. Second, the non-significant PRC difference between key and general institutions suggests that managing the aspiration–resource gap through transparent communication may be as important as increasing resource provision itself. The finding challenges the foundational assumption of policy designation as a mechanism for resource allocation: if "flagship" status does not translate into perceived resource adequacy, then policy design itself may require re-examination. Perceived resource constraints may be shaped more by local implementation quality

and aspiration-expectation gaps than by formal policy designation. Policymakers should focus on implementation fidelity and expectation management rather than merely reclassifying institutions.

The findings carry specific implications for vocational education reform in Southeast Asia, particularly in Thailand, Vietnam, and Indonesia, where similar resource constraints and reform pressures coexist (Nakornthap, 2020; Tran et al., 2021). Thailand's Office of the Vocational Education Commission (OVEC) has pursued ambitious dual-system reforms requiring close industry collaboration, yet implementation has been hindered by persistent resource scarcity. The OVEC's dual-system reform emphasizes industry partnerships as a mechanism for resource augmentation, yet the present findings suggest that even when such partnerships exist, perceived resource constraints may persist if faculty lack the time, equipment, and support to translate industry engagement into innovative teaching practices. The 61 percent attenuation identified in this study provides an empirical benchmark for Thai institutions: leadership training without concurrent investment in laboratory equipment, teacher release time for industry engagement, and technical support staff will leave psychologically empowered faculty unable to act on their motivation. This pattern aligns with observations from Thailand's private vocational system (Widtayakornbundit, 2021). The Vietnam case—with its own dual-system reforms and severe resource constraints (Tran et al., 2021)—offers a parallel context where the dual-investment framework may apply. However, these implications are offered as tentative parallels rather than direct predictions, given governance structure differences that may moderate the contingent process pattern. Cross-national comparative research examining whether the contingent process pattern varies across centralized versus decentralized governance structures remains an essential next step.

*Limitations and Future Research Directions*

The study's findings are bounded by six limitations that simultaneously define future research priorities. First, the cross-sectional design precludes causal inference and cannot empirically verify the temporal sequence implied by the statistical framework; longitudinal or diary designs with three measurement waves—TL at T1, PE at T2, IWB at T3—would strengthen causal claims. The concept of motivational-behavioral decoupling identified here refers to a statistical pattern of contingent associations, not a temporal process; future research should employ experience sampling methods to capture the dynamic interplay between motivation and behavior. Second, the single-source nature of the data, while unlikely to have substantially inflated the findings based on the CMV diagnostics, raises the possibility of same-source bias; future research should incorporate supervisor-rated or peer-rated IWB. Third, the 4-item PRC scale, although contextually grounded and reliably measured, captures overall constraints rather than differentiating resource types; distinguishing between resources for routine tasks versus innovative endeavors would refine theoretical precision. Fourth, the absence of objective resource measures means the key/general institutional classification remains a proxy; the non-significant PRC difference between institutional types further underscores this limitation. Additionally, the ASEAN dynamic is a theoretical conceptualization of the context, not an empirically tested mechanism; future research

should directly measure cross-border partnership intensity to test this conceptualization. Fifth, the sample is drawn exclusively from Guangxi; cross-national replication across Southeast Asian vocational systems with varying governance structures is essential. Sixth, cultural values were not directly measured; future studies should include power distance and collectivism scales to test the cultural contingency of the observed decoupling pattern.

**Conclusion**

This study investigated how and under what conditions transformational leadership fosters faculty innovative behavior in Chinese vocational institutions. The findings demonstrate that psychological empowerment serves as a significant mediating mechanism, and that this indirect effect is contingent on perceived resource constraints—with a 61 percent attenuation under high-constraint conditions. The asymmetric pattern—a non-contingent motivational pathway and a resource-fragile behavioral pathway—empirically reveals a phenomenon of motivational-behavioral decoupling in resource-scarce educational environments. The residual positive effect of PE on IWB under high constraints ($\beta = .16$, $*p* = .042$) suggests that low-resource innovations may remain viable, though incremental, low-resource innovations—rather than transformative ones—are the likely outcome under high constraints.

This study contributes to the literature by situating the SDT–COR integration in a non-Western, resource-constrained vocational context where prior empirical work is absent, using Guangxi as an informative case that tests the limits of SDT's generalizability; providing quantitative evidence for the contingent process logic through the concept of motivational-behavioral decoupling, showing that motivational pathways and expression follow different resource contingencies—a specification that reframes the established TL-PE-IWB model as a conditional rather than universal process; and offering a methodological illustration for testing latent interactions in nested educational data, including the use of equivalence tests (TOST) to validate key null findings. The conditional nature of the motivation-behavior model—demonstrated through the 61 percent attenuation—reveals that the translation of psychological empowerment into innovative action is contingent on resource availability. For the broader landscape of vocational education reform across developing Asia, these findings contribute to understanding human resource development in vocational education institutions. The central message—that resource provision can amplify the innovation returns of leadership development programs—underscores that investing in people and investing in resources are mutually reinforcing necessities for fostering faculty innovation in an era of rapid educational change.

**Conflict of Interest**

The author(s) declare(s) that there is no conflict of interest.

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