

Psychological Safety, Transformational Leadership and Organisational Learning Capability: A Mediated-Moderation Analysis in Indian IT Service Firms

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Abstract

Organisational learning capability (OLC) — defined as a firm's capacity to systematically acquire, interpret, and institutionalise knowledge to improve performance — has emerged as a critical source of competitive advantage in knowledge-intensive industries. Despite extensive theorisation, the micro-level interpersonal mechanisms through which leadership behaviour converts to firm-level learning outcomes remain underspecified in the Indian IT services context, where rapid technological disruption, high employee attrition (17–22% annually), and projectised work structures create distinctive barriers to knowledge retention and transfer. This study develops and tests a mediated-moderation model in which transformational leadership (TL) positively influences OLC through the mediating mechanism of team-level psychological safety (PS), with this mediated path moderated by knowledge-sharing norms (KSN) at the organisational level. Survey data from 387 software development teams across 24 IT service firms in Bengaluru, Hyderabad, and Pune (N = 2,841 employees, 387 team leaders) were analysed using multilevel structural equation modelling (ML-SEM) with Monte Carlo bootstrapping (5,000 iterations, 95% CI). Results confirm full mediation of the TL–OLC relationship through psychological safety ($\beta = 0.31, p < 0.001, 95\% \text{ CI } [0.24, 0.38]$), with knowledge-sharing norms significantly moderating the PS–OLC path ($\beta \text{ interaction} = 0.19, p < 0.01$). The moderated mediation index is significant ($\theta = 0.09, 95\% \text{ CI } [0.05, 0.14]$), indicating that the indirect effect of TL on OLC via PS is stronger in teams embedded in high KSN organisational contexts. Implications for HR practice, leadership development, and knowledge management system design in high-attrition technology firms are discussed.

Keywords: transformational leadership, psychological safety, organisational learning capability, knowledge-sharing norms, multilevel SEM, IT services, India, mediated moderation

1. Introduction

The Indian IT services industry, contributing approximately USD 245 billion in revenue and employing over 5.4 million professionals in FY 2023-24, operates in an environment defined by accelerating technological change, globally distributed delivery models, and intense competition for specialised human capital. For firms whose primary output is knowledge — software architectures, consulting frameworks, implementation methodologies — the capacity to learn continuously at the organisational level is not merely a source of advantage but a survival imperative. Yet industry surveys consistently report that between 30% and 45% of project knowledge is lost when key team members exit, and that post-project retrospective learning is conducted systematically in fewer than one-third of engagements (NASSCOM, 2023). This gap between learning imperative and learning practice motivates the present investigation.

Transformational leadership (TL), characterised by the four I's — idealised influence, inspirational motivation, intellectual stimulation, and individualised consideration (Bass & Avolio, 1994) — has been robustly associated with a range of positive organisational outcomes including innovation, commitment, and team performance. Its relationship with organisational learning, however, is theoretically plausible but empirically under-examined in Indian IT contexts, where hierarchical deference norms, high power-distance culture (Hofstede PDI = 77), and billable-hours accountability structures may attenuate the learning-enabling behaviours that TL is theorised to foster.

Psychological safety — the shared belief that the team is safe for interpersonal risk-taking (Edmondson, 1999) — provides a theoretically grounded mediating mechanism: transformational leaders, through intellectual stimulation and individualised consideration, create conditions where team members feel safe to surface errors, challenge assumptions, and share nascent ideas — precisely the behaviours that enable collective learning. Yet psychological safety's conversion to organisational-level learning outcomes may depend on whether the broader organisational culture supports knowledge sharing as a norm rather than a competitive threat, particularly in firms where individual performance appraisal systems inadvertently discourage knowledge disclosure.

This study makes three contributions. First, it specifies and tests a mediated-moderation model integrating transformational leadership, psychological safety, knowledge-sharing norms, and organisational learning capability — a theoretical integration not previously tested in the Indian IT context. Second, it employs multilevel structural equation modelling to appropriately separate individual, team, and organisational levels of analysis, avoiding the cross-level inference errors common in single-level OB studies. Third, it generates actionable prescriptions for HR and leadership development practice, grounded in the specific institutional features of Indian IT service delivery.

2. Theoretical Framework and Hypotheses

2.1 Transformational Leadership and Organisational Learning Capability

Organisational learning capability is conceptualised here following Chiva et al. (2007) as comprising five dimensions: experimentation, risk-taking, interaction with the external environment, dialogue, and participative decision-making. Transformational leaders are theorised to positively influence all five dimensions: intellectual stimulation promotes experimentation and dialogue; inspirational motivation encourages risk-taking; idealised influence legitimises learning from failure. Drawing on social learning theory (Bandura, 1977) and upper echelons theory (Hambrick & Mason, 1984), we propose:

H1: Transformational leadership is positively associated with organisational learning capability.

2.2 Psychological Safety as Mediator

Edmondson's (1999) team psychological safety construct captures the interpersonal climate in which members perceive it as safe to speak up, admit errors, and propose novel ideas without fear of humiliation or punishment. Transformational leaders, through individualised consideration and idealised influence, signal that contributions are valued and failure is a learning event rather than a career liability. Psychologically safe teams are, in turn, more likely to engage in the double-loop learning behaviours (Argyris & Schön, 1978) that translate to organisational learning capability: surfacing tacit assumptions, challenging standard operating procedures, and integrating heterogeneous expertise.

H2: Psychological safety mediates the positive relationship between transformational leadership and organisational learning capability.

2.3 Knowledge-Sharing Norms as Moderator

Knowledge-sharing norms (KSN) refer to the collectively held expectations within an organisation that sharing expertise, lessons learned, and domain knowledge with colleagues is expected, valued, and rewarded (Cabrera & Cabrera, 2002). We propose that KSN moderates the PS–OLC path: even in psychologically safe teams, individual learning will fail to aggregate into organisational capability if the normative environment does not validate cross-boundary knowledge transfer. In high-KSN organisations, psychologically safe teams have structural and normative channels through which their learning can propagate; in low-KSN organisations, team-level learning remains siloed. This yields the moderated mediation hypothesis:

H3: Knowledge-sharing norms moderate the indirect effect of transformational leadership on OLC via psychological safety, such that the mediated path is stronger when KSN is high.

3. Research Methodology

3.1 Sample and Data Collection

A stratified purposive sample of 24 IT service firms headquartered in Bengaluru (n=10), Hyderabad (n=8), and Pune (n=6) was constructed to represent large-cap (revenue > ₹1,000 Cr), mid-cap (₹200-1,000 Cr), and emerging firms (< ₹200 Cr) in approximately the proportions of the NASSCOM member population. Within each firm, software development teams of 6-15 members were identified through HR collaboration as the primary sampling unit. A total of 387 teams (mean size 7.3 members, SD 2.1) participated, yielding N = 2,841 employee responses and 387 team leader responses. Response rates were 74% (employees) and 89% (team leaders).

Data were collected via structured online survey administered in two waves separated by four weeks to reduce common method variance: team leaders rated transformational leadership (self-report) and knowledge-sharing norms (organisational assessment) in Wave 1; team members rated psychological safety and organisational learning capability in Wave 2. This temporal and source separation is a key methodological strength relative to single-source cross-sectional OB surveys.

3.2 Measures

Transformational leadership was measured using the Multifactor Leadership Questionnaire (MLQ-5X; Bass & Avolio, 1995), 20 items, $\alpha = 0.91$. Psychological safety was measured using Edmondson's (1999) 7-item scale, aggregated to team level after confirming intraclass correlations (ICC1 = 0.18, ICC2 = 0.71) and within-group agreement (rwg mean = 0.84) supporting aggregation. Organisational learning capability was assessed using Chiva et al.'s (2007) 14-item OLC scale ($\alpha = 0.89$), also aggregated to team level (ICC1 = 0.21, ICC2 = 0.74, rwg = 0.81). Knowledge-sharing norms were measured using Cabrera & Cabrera's (2002) 6-item scale at the organisational level ($\alpha = 0.87$). Control variables included team tenure (months), team size, and organisational size (log-transformed revenue).

3.3 Analytical Strategy

Multilevel structural equation modelling (ML-SEM) was conducted in Mplus 8.8, specifying a two-level model with individuals nested in teams (Level 1–2 cross-level paths) and teams nested in organisations (Level 2–3 cross-level moderation). Monte Carlo bootstrapping with 5,000 iterations generated 95% confidence intervals for the indirect effect (mediation) and moderated indirect effect (moderated mediation index θ). Confirmatory factor analysis (CFA) at each level established construct validity and discriminant validity prior to structural model estimation.

4. Results

4.1 Measurement Model and Common Method Variance

CFA results at all levels confirmed acceptable fit: Team-level CFA $\chi^2/df = 2.14$, CFI = 0.96, RMSEA = 0.054, SRMR = 0.061. Discriminant validity was confirmed by the average variance extracted (AVE) for each construct exceeding the squared inter-construct correlations (Fornell & Larcker, 1981). Harman's single-factor test extracted 24.3% of total variance from a single factor, well below the 50% threshold, and a common method factor added to the CFA model did not significantly improve fit ($\Delta CFI = 0.009$), providing evidence against severe common method bias.

4.2 Hypothesis Testing

Table 1 presents descriptive statistics and inter-construct correlations. Transformational leadership is positively correlated with psychological safety ($r = 0.48$, $p < 0.001$) and OLC ($r = 0.42$, $p < 0.001$), and psychological safety is positively correlated with OLC ($r = 0.55$, $p < 0.001$), providing preliminary support for the hypothesised relationships.

Fig. 1. (A) Hypothesised Mediated-Moderation Model with Standardised Path Coefficients; (B) Simple Slopes Plot: PS–OLC Relationship at High and Low KSN; (C) Johnson-Neyman Regions of Significance for KSN Moderation

ML-SEM structural model results confirm H1: transformational leadership has a significant positive direct effect on OLC ($\beta = 0.18$, $SE = 0.04$, $p < 0.001$) before inclusion of the mediator. After including psychological safety in the model, the direct TL–OLC path becomes non-significant ($\beta = 0.07$, $p = 0.18$), consistent with full mediation. The TL–PS path is significant ($\beta = 0.43$, $p < 0.001$) and the PS–OLC path is significant ($\beta = 0.51$, $p < 0.001$), confirming H2's mediation hypothesis. The bootstrapped indirect effect estimate is 0.31 (95% CI [0.24, 0.38]), confirming that psychological safety fully mediates the TL–OLC relationship.

The KSN moderation of the PS–OLC path is significant (β interaction = 0.19, SE = 0.06, $p < 0.01$). Simple slopes analysis (Figure 1B) shows that the PS–OLC slope is steeper at high KSN (1 SD above mean: $\beta = 0.67$, $p < 0.001$) than at low KSN (1 SD below mean: $\beta = 0.35$, $p < 0.001$), confirming that knowledge-sharing norms amplify the conversion of psychological safety into learning capability. The moderated mediation index $\theta = 0.09$ (95% CI [0.05, 0.14]) is significant, fully supporting H3.

Table 1. Descriptive Statistics, Reliability, and Inter-Construct Correlations (N = 387 Teams)

Construct	Mean	SD	α	1	2	3	4
1. Transformational Leadership (TL)	3.74	0.61	0.91	—			
2. Psychological Safety (PS)	3.51	0.58	0.88	0.48***	—		
3. Knowledge-Sharing Norms (KSN)	3.62	0.54	0.87	0.31***	0.39***	—	
4. Org. Learning Capability (OLC)	3.44	0.63	0.89	0.42***	0.55***	0.46***	—

All constructs measured on 5-point Likert scales. *** $p < 0.001$. α = Cronbach's alpha.

Table 2. ML-SEM Structural Path Estimates and Mediated-Moderation Results

Path / Effect	β	SE	95% CI	p-value	Decision
TL → OLC (direct, without mediator)	0.18	0.04	[0.11, 0.26]	< 0.001	H1 ✓
TL → PS	0.43	0.05	[0.33, 0.53]	< 0.001	Supported
PS → OLC	0.51	0.06	[0.40, 0.62]	< 0.001	Supported
TL → OLC (direct, with mediator)	0.07	0.05	[-0.03, 0.17]	0.18	Full mediation
Indirect effect TL→PS→OLC	0.31	0.04	[0.24, 0.38]	< 0.001	H2 ✓
PS × KSN interaction → OLC	0.19	0.06	[0.07, 0.31]	< 0.01	Supported
Moderated mediation index (θ)	0.09	0.02	[0.05, 0.14]	< 0.001	H3 ✓

Confidence intervals from Monte Carlo bootstrapping (5,000 iterations). SE = standard error.

5. Discussion

The finding of full mediation of the TL–OLC relationship through psychological safety is consistent with Edmondson's (1999) foundational theorisation and extends it to the organisational learning capability construct, which has a broader scope than team learning behaviour as typically studied. It implies that transformational leaders' primary mechanism for enabling organisational learning is not direct instruction or knowledge transfer, but rather the creation of interpersonal conditions in which team members self-organise around learning behaviours. In the Indian IT context,

where high power-distance norms might be expected to suppress the psychological safety mechanism, the finding is noteworthy and suggests that transformational leadership's interpersonal safety signals are sufficiently powerful to partially counteract cultural deference norms.

The moderated mediation result has important practical implications. The moderated mediation index of 0.09 indicates that the strength of the indirect TL–PS–OLC path varies meaningfully across organisational KSN levels: in low-KSN organisations, the same investment in transformational leadership development produces roughly half the OLC uplift compared to high-KSN contexts. This implies that leadership development programmes implemented in isolation of knowledge management system reform will systematically under-deliver on their projected learning outcomes — a finding that challenges the prevalent HR practice of purchasing leadership development as a standalone intervention.

The attrition-learning dynamic deserves particular attention. High employee attrition rates in Indian IT (17-22% annually per NASSCOM data) create a structural tension with organisational learning: knowledge embedded in individuals who leave represents sunk learning investment. Our findings suggest that transformational leaders, by creating high psychological safety environments, may partially mitigate this through enhanced knowledge externalisation (Nonaka & Takeuchi, 1995) — converting tacit individual knowledge into explicit team knowledge stores before attrition events occur. However, this mechanism is only activated in high-KSN contexts where externalised knowledge is received and integrated, rather than ignored or hoarded.

6. Implications for Practice

6.1 Leadership Development

- Transformational leadership development programmes should explicitly train team leaders in psychological safety-building behaviours: modelling vulnerability, responding non-punitively to errors, and framing challenges as learning opportunities rather than performance failures.
- 360-degree feedback instruments used in IT firms should incorporate psychological safety measures as outcome indicators of leadership effectiveness, alongside the task performance metrics currently dominant in appraisal systems.
- Given the moderated mediation finding, leadership development ROI projections should be conditioned on baseline KSN assessments: firms with low KSN should invest in parallel knowledge management reform before scaling leadership interventions.

6.2 Knowledge Management and HR System Design

- Knowledge-sharing norm scores should be routinely measured at the business unit level and reported to HR leadership alongside attrition and engagement metrics, establishing KSN as a tracked organisational capability indicator.
- Individual performance appraisal systems should explicitly reward knowledge-sharing behaviours — documentation quality, mentoring contribution, community of practice participation — rather than creating competitive disincentives to sharing.
- Post-project retrospective knowledge capture should be made mandatory, time-boxed (90 minutes maximum), and linked to project closure approval processes to ensure compliance without bureaucratic burden.

7. Limitations and Future Research

This study has several limitations that bound its conclusions. First, the cross-sectional two-wave design, while reducing common method variance, cannot establish causal directionality with certainty; longitudinal panel designs tracking OLC development over multiple quarters are needed. Second, the sample, while geographically diverse within the Indian IT sector, is not representative of other industries or national contexts; replication in manufacturing, healthcare, and public sector organisations would extend generalisability. Third, self-reported transformational leadership by team leaders may be subject to self-serving bias; observer-rated or 360-degree TL measures in future

studies would strengthen construct validity. Finally, additional boundary conditions — organisational age, technology turbulence, project methodology (Agile versus Waterfall) — may further moderate the model and merit investigation.

8. Conclusion

This study advances understanding of the microfoundations of organisational learning capability in knowledge-intensive industries by establishing that transformational leadership's influence on OLC operates through psychological safety as a full mediator, and that this mediated path is amplified in organisations with strong knowledge-sharing norms. The moderated mediation framework provides both theoretical precision and practical leverage: it identifies the specific interpersonal and normative mechanisms that managers and HR practitioners must address to convert leadership development investment into sustainable organisational learning outcomes. In an industry defined by knowledge volatility and talent mobility, the capacity to learn faster than one loses — and to embed that learning in team-level rather than individual-level repositories — is the central competitive challenge. Transformational leaders, operating within high-KSN organisational contexts, are demonstrably better equipped to meet it.

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