

# Cognitive Diversity, Team Efficacy and Team Learning: A Triadic Model for Enhancing Team Performance

FIB Business Review

1–19

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DOI: 10.1177/23197145261421730

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## Abstract

This study examines the mechanisms by which cognitive diversity affects team performance in India's banking sector, an industry characterized by digital transformation and hierarchical organizational norms. Grounded in the social cognitive theory, we propose a triadic model in which team efficacy mediates the relationship between cognitive diversity and performance, while team learning moderates the efficacy–performance pathway. Data were collected from 39 banking teams (392 respondents: 33 team leaders and 359 team members) using a three-wave, time-lagged survey design. Psychometric analyses confirmed strong internal consistency ( $\alpha = 0.869–0.905$ ) and appropriate team-level aggregation (ICC (1) = 0.18–0.23; ICC (2) = 0.72–0.78). Covariance-based structural equation modelling revealed that cognitive diversity exhibited both a direct positive association with team performance ( $\beta = 0.113$ ,  $p < .01$ ) and an indirect association mediated through team efficacy, with bootstrapped confidence intervals (0.071–0.152) confirming robustness. Team learning significantly strengthened the efficacy–performance relationship, with conditional indirect effects increasing from 0.034–0.104 under low-learning conditions to 0.099–0.208 under high learning conditions. These findings advance the social cognitive theory by establishing team efficacy as the psychological mechanism linking diverse cognitive inputs to coordinated action and team learning as a critical boundary condition in high-power-distance contexts. Practically, this study demonstrates that banking organizations must systematically cultivate collective efficacy and embed continuous learning routines to harness the performance benefits of cognitive diversity.

## Keywords

Cognitive diversity, team performance, team efficacy, team learning, social cognitive theory, workplace diversity

## Introduction

This study argues that cognitive diversity (CD) enhances team performance (TP) not directly, but through shared efficacy beliefs that translate diverse cognitions into coordinated action, contingent on the presence of strong team learning routines. CD, defined as differences in knowledge, perspectives and problem-solving approaches among team members, has received sustained scholarly attention because of its potential to enhance decision-making and TP. Theoretically, cognitively diverse teams possess broader informational resources and are better equipped to address complex, non-routine tasks.

Empirically, however, findings remain mixed: prior studies report positive, negative and null relationships between CD and TP. These inconsistencies suggest that CD is not inherently beneficial; rather, its performance effects depend on the psychological mechanisms and contextual conditions that shape how diverse inputs are integrated into collective action.

Contemporary diversity research increasingly emphasizes that diversity influences performance indirectly through emergent team processes rather than through direct effects alone. Despite this shift, limited consensus exists

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regarding which psychological mechanisms translate CD into coordinated team behaviour. Drawing on the social cognitive theory (SCT), which posits that performance emerges from the interaction of personal factors, behavioural regulators and environmental conditions (Bandura, 1991), this study focuses on team efficacy (TE), a team's shared belief in its collective capability, as a central psychological mechanism. Prior research demonstrates that efficacy beliefs shape motivation, persistence and coordinated effort in teams (Chen et al., 2025; Gully et al., 2002), yet their role in explaining when and how CD improves performance remains underexamined.

In addition to mechanisms, diversity research has given insufficient attention to the boundary conditions under which efficacy beliefs translate into performance. SCT emphasizes that efficacy is enacted and reinforced through environmental feedback and learning processes (Bandura, 1997; Schunk & DiBenedetto, 2020). In team settings, team learning (TL), reflective discussion, feedback-seeking and knowledge exchange provide the behavioural infrastructure that enables teams to integrate diverse perspectives and translate shared confidence into adaptive action (Edmondson, 1999; Edmondson & Harvey, 2025; Harvey et al., 2019). Without such learning routines, teams may possess confidence but lack the coordination processes required to leverage cognitive heterogeneity effectively.

A further limitation of the existing research concerns contextual generalizability. Much of the evidence on CD is drawn from Western, low-power-distance settings, where open debate and direct voice are culturally normative. In contrast, the Indian banking sector is characterized by hierarchical structures, collectivist norms, high regulatory demands and increasing cognitive heterogeneity driven by digital transformation (Anand & Raghuvanshi, 2024; Pereira & Malik, 2015). In such contexts, observational learning and relational coordination may play a more prominent role than direct confrontation, making India a theoretically meaningful setting to examine SCT-based mechanisms linking diversity to performance.

Addressing these gaps, this study proposes and tests a second-stage moderated mediation model in which TE mediates the relationship between CD and TP, and TL moderates the efficacy–performance linkage. Using multi-source, time-lagged, team-level data from public and private sector banks in India, the study makes three contributions. First, it advances SCT by empirically identifying TE as the psychological mechanism and TL as the boundary condition through which CD translates into performance. Second, it contributes to diversity and team research by clarifying why prior findings on CD and performance have been inconsistent. Third, it extends this literature to a high-power-distance, collectivist banking context, demonstrating how CD can enhance performance when supported by appropriate psychological and learning processes.

## Theoretical Framework

This study is grounded in SCT (Bandura, 1991), which posits that human functioning emerges from dynamic interactions among personal factors (e.g., cognitions and beliefs), behavioural processes and environmental conditions, a principle known as reciprocal determinism (Lin et al., 2019). Within this framework, CD constitutes a personal factor, reflecting the heterogeneity of perspectives, knowledge bases and problem-solving approaches that team members bring to collaborative work. When contextual conditions support effective integration, such diversity can enhance creativity and decision quality (Schunk & DiBenedetto, 2020). However, absent appropriate psychological and behavioural coordination mechanisms, CD may also increase misunderstanding and process friction, underscoring the need to identify when and how diversity contributes to TP.

TE, a team's shared belief in its collective capability to organize and execute actions required to achieve specific performance outcomes, represents the central psychological mechanism linking CD to performance (Bandura, 1997). TL, characterized by collective reflection, feedback-seeking and knowledge exchange (Fan et al., 2021; Mastrorilli et al., 2025), provides the behavioural and environmental infrastructure that determines whether efficacy beliefs translate into coordinated action. Together, TE and TL operationalize the behavioural and environmental components of SCT's reciprocal determinism framework.

### *Distinguishing Team Efficacy from Related Constructs*

TE is conceptually distinct from related team-level constructs in both scope and function. First, TE is task-specific, capturing shared beliefs about a team's capability to perform particular collective tasks (Bandura, 1997). In contrast, team potency reflects a generalized sense of confidence across tasks and contexts (Gully et al., 2002), while psychological safety concerns perceptions of interpersonal risk and comfort in expressing ideas (Edmondson, 1999).

Second, TE represents the most theoretically appropriate mediating mechanism linking CD to TP. Psychological safety facilitates the expression of diverse viewpoints but does not ensure their synthesis into goal-directed action. Team potency reflects broad confidence but lacks the sensitivity to task-specific coordination demands. By contrast, TE directly captures teams' performance-oriented confidence in their ability to integrate diverse cognitive inputs into coordinated execution.

Third, SCT identifies mastery experiences, vicarious learning and social persuasion as primary sources of efficacy beliefs, processes that become especially salient when teams synthesize heterogeneous perspectives into

collective action (Bandura, 1997; Schunk & DiBenedetto, 2020). Accordingly, TE constitutes the psychological mechanism through which CD is transformed into shared confidence and coordinated performance behaviour.

### **Triadic Model: Cognitive Diversity, Team Efficacy and Team Learning**

The proposed model (Figure 1) integrates CD, TE and TL within SCT's reciprocal determinism framework. CD enhances TE by exposing teams to varied informational cues, problem-solving strategies and social modelling opportunities, conditions that strengthen collective efficacy beliefs through mastery and vicarious experiences (Bandura, 1997; Schunk & DiBenedetto, 2020). Through these processes, diverse perspectives expand teams' cognitive resources and support richer sensemaking and more robust strategy formulation (Martins & Sohn, 2022; Mello & Rentsch, 2015).

Operating as a behavioural regulator, TE translates diverse cognitive inputs into performance by fostering shared confidence, coordinated action and collective goal commitment (Gully et al., 2002; Mitchell et al., 2019). High-efficacy teams exhibit greater motivation, persistence and adaptability, capabilities that are particularly critical for complex, interdependent tasks requiring a systematic integration of diverse viewpoints (Fan et al., 2021).

TL functions as the environmental enabler that conditions the efficacy–performance relationship. Through ongoing reflection, feedback exchange and adaptive experimentation, learning routines create feedback loops that enact and reinforce efficacy beliefs via continuous mastery experiences (Edmondson, 1999; Li et al., 2023). In cognitively diverse teams, such learning processes are especially critical for converting collective confidence into effective execution (Chung & Li, 2021). Conversely, weak learning environments constrain the translation of efficacy

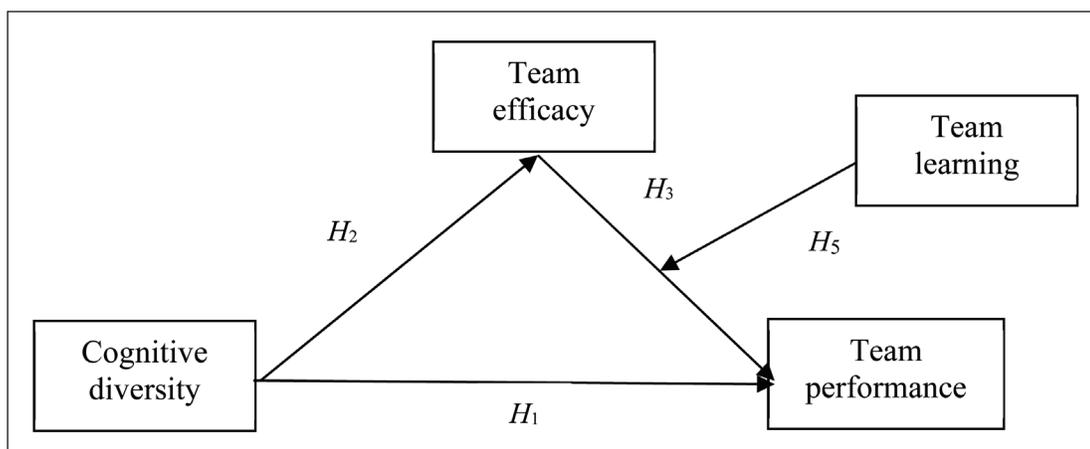
beliefs into adaptive action, attenuating the diversity–performance relationship.

Overall, TE operates as the psychological mechanism through which CD influences performance, while TL serves as the boundary condition that determines when efficacy beliefs yield tangible outcomes. This triadic structure directly reflects SCT's central proposition that performance arises from the dynamic interplay of personal characteristics, psychological processes and environmental conditions.

### **Cultural Contingencies and Scope Conditions: India as a Critical Case**

The Indian banking sector provides a theoretically meaningful context for examining SCT-based mechanisms within high-power-distance and collectivist environments. Characterized by hierarchical coordination structures and relational norms (Bansal et al., 2025; Pereira & Malik, 2015), this context shapes how teams express dissent, engage in learning and build shared efficacy. Unlike low-power-distance Western settings that emphasize direct debate, Indian banking teams often rely more heavily on observational learning, vicarious experiences and social modelling, mechanisms central to SCT's efficacy-building processes (Bandura, 1991).

This context offers three theoretical advantages. First, it enables the examination of whether CD enhances performance in hierarchical cultures where formal authority may constrain voice, an underexplored issue in diversity research dominated by Western samples. Second, it clarifies how TE develops through collective mastery and social modelling rather than individual assertiveness, extending SCT's explanatory scope to collectivist settings. Third, the sector's regulatory complexity, digital transformation pressures and functional interdependence parallel other high-stakes industries (healthcare, defence and professional services), enhancing the framework's theoretical transportability.



**Figure 1.** Conceptual Model Linking Cognitive Diversity, Team Efficacy, Team Learning and Team Performance.

The proposed framework is expected to operate most strongly under conditions of high task interdependence, substantial knowledge complexity and robust learning routines. Conversely, effects may weaken when tasks are modular, when cognitive homogeneity suffices or when cultural constraints suppress learning and voice behaviours.

## Literature Review and Hypothesis Development

### *Cognitive Diversity and Team Performance*

Meta-analytic and empirical research indicates that CD, variations in thinking styles, problem-solving approaches and knowledge domains can enhance TP by expanding informational resources, challenging entrenched assumptions and generating more comprehensive solution sets (Ishikawa, 2025; Martins & Sohn, 2022; Mitchell et al., 2019; Zhang et al., 2023). These benefits arise when teams are able to effectively integrate diverse perspectives into coordinated actions. However, without appropriate coordination mechanisms, cognitive differences may increase miscommunication and relational conflicts, offsetting potential performance gains (Mathuki & Zhang, 2024; Schmidt & Mayer, 2020).

In the Indian banking sector, teams often comprise members from diverse linguistic, educational and functional backgrounds, creating both opportunities and integration challenges (Showkat & Misra, 2022). When coordination structures support integration, such heterogeneity promotes observational learning, adaptive problem-solving and collaborative innovation, capabilities that are particularly salient in digitally transforming and highly regulated environments (Devassy & Jindal, 2024; Shivhare, 2025). Accordingly, we propose the following:

$H_1$ : Cognitive diversity is positively related to team performance.

### *Cognitive Diversity and Team Efficacy*

Drawing on SCT, CD is expected to strengthen TE through efficacy-building processes such as mastery experiences, vicarious learning and social modelling. Exposure to diverse cognitive approaches enables teams to observe multiple problem-solving strategies, experiment with alternative solutions and build shared confidence through successful integration efforts (Lee et al., 2024; Schoss et al., 2022). Empirical studies demonstrate that cognitive heterogeneity enhances information processing thoroughness and decision quality, reinforcing collective confidence in team's capability to perform effectively (Houston et al., 2025; Qu et al., 2024; Wang & Zhang, 2023).

These processes are particularly salient in hierarchical contexts such as Indian banking, where social learning frequently occurs through observation rather than direct

debate. When team members witness colleagues effectively applying diverse cognitive approaches, and when teams collectively succeed in integrating these inputs, their shared belief in the team's capability strengthens (Fan et al., 2021; Mastrotrilli et al., 2025). Thus, we hypothesize the following:

$H_2$ : Cognitive diversity is positively related to team efficacy.

### *Team Efficacy and Team Performance*

The relationship between TE and TP is among the most robust findings in team research, supported by extensive meta-analytic evidence (Gully et al., 2002; Hülshager et al., 2009). High-efficacy teams exhibit greater motivation, persistence and coordinated effort, behavioural patterns that directly enhance performance on complex and interdependent tasks (Lee & Kim, 2022; Williams & Chen, 2021).

TE influences performance through multiple pathways. First, efficacy beliefs shape how teams interpret challenges, with high-efficacy teams viewing obstacles as manageable through collective effort rather than as indicators of inadequacy. Second, efficacy affects goal-setting and effort allocation, with confident teams setting more ambitious targets and sustaining effort during setbacks. Third, efficacy supports proactive planning and adaptive problem-solving, whereas low efficacy undermines coordination and increases disengagement (Garcia et al., 2024). Accordingly, we propose the following hypothesis:

$H_3$ : Team efficacy is positively related to team performance.

### *Team Efficacy as a Mediating Mechanism*

TE serves as the psychological mechanism through which CD influences TP. While CD provides heterogeneous informational inputs, TE determines whether these inputs are integrated into coordinated actions or fragmented into subgroup silos (Hardin et al., 2024; Mastrotrilli et al., 2025). High-efficacy teams demonstrate the resilience, persistence and coordination required to manage the integration demands inherent in cognitive heterogeneity (Fan et al., 2021; Lopez-Gajardo et al., 2023).

From an SCT perspective, efficacy beliefs regulate group motivation, strategic direction and sustained effort (Bandura, 1991). In cognitively diverse teams, strong efficacy beliefs enable members to view differences as complementary resources rather than coordination obstacles, facilitating effective integration and performance (Li et al., 2023; Schunk & DiBenedetto, 2020). Thus, TE functions both as a direct predictor of performance ( $H_3$ ) and as an indirect mechanism linking CD to performance:

$H_4$ : Team efficacy mediates the relationship between cognitive diversity and team performance.

### **Team Learning as a Moderator and Moderated Mediation**

TL, encompassing reflection, knowledge sharing and adaptive experimentation (Edmondson & Harvey, 2025), represents the environmental condition that determines when TE translates into performance gains. Within SCT, learning behaviours provide feedback loops through which efficacy beliefs are enacted, tested and reinforced (Narayan et al., 2021; Yoon & Kayes, 2016). High levels of TL create continuous mastery experiences by enabling teams to experiment with diverse approaches, receive feedback and adapt coordination strategies over time (Harvey et al., 2019).

Conversely, low-learning environments constrain the efficacy–performance linkage. Even teams with high efficacy may struggle to adapt or refine strategies in the absence of systematic reflection and knowledge exchange, thereby weakening performance outcomes (Ahmad, 2025; You, 2024). These dynamics are especially salient in cognitively diverse teams, where integration demands are substantial and coordination strategies must evolve through experience.

Accordingly, TL is expected to moderate the second stage of the mediation pathway (TE → TP), strengthening the indirect effect of CD on performance when learning is high and attenuating it when learning is low. This yields a second-stage moderated mediation hypothesis:

$H_5$ : Team learning moderates the indirect effect of cognitive diversity on team performance through team efficacy, such that the mediated relationship is stronger when team learning is high than when team learning is low.

The hypothesized relationships are depicted in Figure 1.

### **Research Methodology**

Data were collected from 39 teams across public and private sector banks in India. Managers facilitated team access and supported coordination during data collection. Ethical approval was obtained from the NISTU Ethics Committee (Letter No. NISTU/R&D/ETHC/016, dated 10/02/2025), and all participants provided written informed consent. Participation was voluntary, confidentiality was ensured through anonymous coding and data were stored on password-protected university servers with access restricted to the research team. In line with institutional policies, all data will be retained for 1 year and permanently deleted thereafter. Participants were informed of their right to withdraw at any stage without penalty, and all responses were used solely for academic research purposes.

A purposive sampling approach was adopted to ensure that participants possessed relevant experience and contextual knowledge. To mitigate common method bias, data were collected using a three-wave, time-lagged design (Podsakoff et al., 2003). In Phase 1, participants provided demographic information and responded to measures of CD. After a 20-day interval, Phase 2 captured responses for TE and TL. Following a further 20-day interval, Phase 3 involved team leaders providing ratings of TP. This temporal separation reduces response biases associated with single-source, same-time data collection.

Both team members and their respective team leaders participated in the survey. Of the 39 teams contacted, 36 teams returned completed questionnaires, yielding 437 responses. After excluding 45 incomplete responses, the final sample comprised 392 usable responses, including 33 team leaders and 359 team members (Mathuki & Zhang, 2024).

Measurement properties were first examined at the individual level ( $N = 392$ ). For hypothesis testing, all constructs were aggregated to the team level; accordingly, structural equation modelling and PROCESS analyses were conducted at the team level ( $N = 39$  teams).

### **Control Variables**

We controlled for demographic variables that may influence TP, including age (continuous), gender (categorical: 0 = male, 1 = female), education (ordinal), experience (ordinal) and firm size (ordinal). As shown in Table 3, none of the control variables exerted a significant effect on the study relationships.

### **Measurements**

All constructs were measured using established scales with a 5-point Likert format (1 = strongly disagree, 5 = strongly agree). Full measurement items are reported in Appendix A.

- CD: Measured using a 4-item scale adapted from Van der Vegt and Janssen (2003), capturing variation in team members' thinking styles and problem-solving approaches ( $\alpha = 0.869$ ).
- TP: Assessed using a 7-item scale from Zhang et al. (2011), measuring goal achievement, effectiveness and work quality. Team leaders provided performance ratings to reduce common method bias ( $\alpha = 0.905$ ).
- TE: Measured with a 7-item scale adapted from Mosley et al. (2008), assessing shared confidence in collective capability ( $\alpha = 0.904$ ).
- TL: Assessed using a 7-item scale from Edmondson (1999), capturing reflection, knowledge-sharing and feedback-seeking behaviours ( $\alpha = 0.897$ ).

All Cronbach's  $\alpha$  coefficients exceeded the recommended threshold of 0.70, indicating strong internal consistency (Hair et al., 2014).

### Justification for Team-level Analysis and Sample Adequacy

Although the team-level sample ( $N = 39$  teams) may appear modest, it is methodologically appropriate for the present study for several reasons. First, the research focuses on teams operating in highly interdependent, knowledge-intensive and hierarchical environments, where teams constitute theoretically meaningful units for examining SCT mechanisms. Second, the nested data set comprises 392 individual respondents (average team size = 10.05), providing sufficient statistical power for team-level and multilevel analyses. Simulation research indicates that models with 30–50 groups yield stable parameter estimates when individual-level samples exceed 300 and robust estimation techniques are employed (Maas & Hox, 2005; Muthen & Muthen, 2002).

#### Intraclass Correlation Coefficients

To justify the aggregation of individual responses to the team level, intraclass correlation coefficients (ICC (1) and ICC (2)) and within-group agreement indices were computed. ICC (1) reflects the proportion of variance attributable to team membership, while ICC (2) indicates the reliability of team-level means. Results were as follows: CD (ICC (1) = 0.18; ICC (2) = 0.72), TE (ICC (1) = 0.21; ICC (2) = 0.76), TL (ICC (1) = 0.19; ICC (2) = 0.74) and TP (ICC (1) = 0.23; ICC (2) = 0.78). All ICC (1) values exceeded the recommended threshold of 0.12, and all ICC (2) values exceeded 0.70, indicating adequate within-team agreement and between-team differentiation (Bliese, 2000; Glick, 1985). These results support aggregation to the team level. A consolidated summary is presented in Table 1.

#### Variable Centring and Interaction Terms

To facilitate interpretation and reduce multicollinearity, all continuous predictors (CD, TE and TL) were mean-centred prior to constructing the interaction term (TE  $\times$  TL) (Aiken & West, 1991). Variance inflation factors (VIFs) ranged from 1.08 to 1.21, well below the conservative threshold of 3.0, indicating that multicollinearity was not a concern.

#### Bootstrapped Indirect Effects

Bootstrapping with 5,000 resamples was used to assess the stability of indirect effects (Preacher & Hayes, 2008). The bootstrapped 95% confidence interval for the

mediation pathway (CD  $\rightarrow$  TE  $\rightarrow$  TP) was [0.071, 0.152], excluding zero and confirming a statistically robust mediation effect. For moderated mediation, conditional indirect effects were significant at low ( $-1$  SD: [0.034, 0.104]), mean ([0.070, 0.150]), and high ( $+1$  SD: [0.099, 0.208]) levels of TL, indicating that team learning meaningfully strengthens the indirect effect of CD through TE.

#### Variance Inflation Factor Diagnostics

VIF diagnostics further confirmed low multicollinearity: CD (1.08), TE (1.15), TL (1.12) and TE  $\times$  TL (1.21). Corresponding tolerance values ranged from 0.83 to 0.93, reinforcing the stability of parameter estimates (Hair et al., 2014).

#### Subgroup Consistency Checks

To assess generalizability across organizational contexts, subgroup analyses compared public sector teams ( $N = 22$ ) and private sector teams ( $N = 17$ ). Results were consistent across groups: CD  $\rightarrow$  TP ( $\beta_{\text{public}} = 0.118$ ;  $\beta_{\text{private}} = 0.107$ ) and CD  $\rightarrow$  TE  $\rightarrow$  TP ( $\beta_{\text{public}} = 0.115$ ;  $\beta_{\text{private}} = 0.104$ ). No statistically significant differences were observed, indicating that findings are robust across sector types.

Taken together, the team-level sample ( $N = 39$  teams) is methodologically adequate and empirically justified. This adequacy is supported by: (a) a substantial individual-level sample ( $N = 392$  individuals nested in 39 teams); (b) robust ICC and within-group agreement (rwg) statistics justifying aggregation; (c) bootstrapped confidence intervals confirming effect stability; (d) low VIFs, indicating no multicollinearity concerns; and (e) consistent findings across public and private sector subsamples. Collectively, these diagnostics indicate that the reported results are stable, reliable and not driven by sampling artefacts.

## Data Analysis and Results

We employed covariance-based structural equation modelling (CB-SEM), supplemented with Hayes's PROCESS macro, to analyse the data. AMOS was used to estimate the measurement and structural models and to assess construct validity and reliability (Hair et al., 2014). SPSS PROCESS was employed to test the moderation and second-stage moderated mediation effects using Model 1

**Table 1.** Justification for Aggregation to the Team Level.

Construct	ICC (1)	ICC (2)	Mean rwg	Interpretation
CD	0.18	0.72	0.81	Meets thresholds for aggregation
TE	0.21	0.76	0.83	Meets thresholds for aggregation
TL	0.19	0.74	0.82	Meets thresholds for aggregation
TP	0.23	0.78	— <sup>a</sup>	Leader-rated; ICC values justify aggregation

**Source:** Primary data.

**Notes:** ICC (1) values represent the proportion of variance attributable to team membership, while ICC (2) values indicate the reliability of team-level means. All ICC (1) values exceed 0.12, and all ICC (2) values exceed 0.70.

and Model 14, respectively, and to confirm the robustness of the findings (Hayes, 2018).

### Measurement Model Analysis

#### Justification for Team-level Aggregation

Given the multilevel structure of the data, we first assessed the appropriateness of aggregating individual-level perceptions to the team level. Table 1 reports ICC (1) and ICC (2) and within-group agreement indices (rwg) for all study constructs.

Mean within-group agreement values (rwg) for member-rated constructs exceed 0.70, supporting aggregation of individual responses to the team level.

\*rwg was not calculated for TP as this construct was rated by a single team leader per team rather than aggregated from multiple team members; ICC values alone justify team-level analysis for leader-rated outcomes.

Level-of-analysis consistency: Descriptive statistics and measurement model assessments are reported at the individual level ( $N = 392$  respondents: 359 team members and 33 team leaders, nested within 39 teams) to establish reliability and validity prior to aggregation. Unless

otherwise stated, all hypothesis testing, structural model analyses, mediation, moderation and moderated mediation results are conducted at the team level ( $N = 392$  individuals nested in 39 teams) using aggregated constructs.

As shown in Table 1, all constructs exhibited ICC (1) values above 0.12, ICC (2) values above 0.70 and rwg values (for member-rated constructs) above 0.70, providing strong empirical justification for aggregation and analysis at the team level.

### Measurement Model Analysis

The measurement model was evaluated using AMOS to assess construct reliability and validity. All standardized factor loadings exceeded 0.50, with the majority above 0.70, indicating acceptable indicator reliability (Hair et al., 2014). As all items met recommended thresholds, no indicators were removed.

Internal consistency reliability was assessed using Cronbach's  $\alpha$  and composite reliability (CR), with values above 0.70 indicating satisfactory reliability (Hair et al., 2014; Nunnally & Bernstein, 1994). As reported in Table 2,

**Table 2.** Reliability and Validity Results.

Constructs	Loadings	$p$ Value	$\alpha$ Value	CR	AVE
<b>Cognitive Diversity in Teams</b>					
CDT1	0.843	.012	0.869	0.871	0.628
CDT2	0.793	.016			
CDT3	0.774	.016			
CDT4	0.757	.034			
<b>Team Performance</b>					
TP1	0.807	.018	0.905	0.906	0.580
TP2	0.789	.012			
TP3	0.796	.021			
TP4	0.741	.010			
TP5	0.718	.019			
TP6	0.777	.007			
TP7	0.695	.026			
<b>Team Efficacy</b>					
TE1	0.750	.006	0.904	0.905	0.577
TE2	0.729	.013			
TE3	0.721	.016			
TE4	0.745	.023			
TE5	0.775	.012			
TE6	0.714	.016			
TE7	0.792	.009			
<b>TL</b>					
TL1	0.792	.028	0.897	0.898	0.558
TL2	0.752	.020			
TL3	0.732	.013			
TL4	0.755	.014			
TL5	0.772	.013			
TL6	0.779	.026			
TL7	0.735	.012			

**Source:** Primary data.

**Notes:**  $N = 392$  individuals nested in 39 teams.

\* $p < .05$ .

**Table 3.** Descriptive Statistics and Inter-correlations.

Variable	1	2	3	4	5	6	7	8	9
Age	1.00								
Gender	-0.14**	1.00							
Experience	-0.05	0.02	1.00						
Qualification	0.12*	0.13*	0.08	1.00					
Firm size	0.08	0.07	0.03	-0.02	1.00				
CD	-0.06	-0.04	-0.03	0.04	0.05	(0.79)			
TP	0.02	-0.08	0.04	0.05	-0.00	0.26**	(0.76)		
TE	-0.02	-0.10*	0.02	0.02	0.00	0.25**	0.52**	(0.76)	
TL	-0.03	0.08	-0.00	-0.03	-0.09	0.08	0.35**	0.15**	(0.75)

**Source:** Primary data.

**Notes:**  $N = 392$ .

\* $p < .05$ , \*\* $p < .01$ .

Square roots of AVE are in parentheses.

$\alpha$  and CR values ranged from 0.871 to 0.906, confirming strong internal consistency across all constructs.

Convergent validity was evaluated using the average variance extracted (AVE), with values exceeding the recommended threshold of 0.50, indicating that constructs explained more than half of the variance in their indicators (Fornell & Larcker, 1981). AVE values ranged from 0.558 to 0.628, demonstrating satisfactory convergent validity. Discriminant validity was assessed using the Fornell–Larcker criterion, and results showed that the square root of each construct's AVE exceeded its inter-construct correlations, indicating adequate discriminant validity (Tables 2 and 3).

Taken together, these results indicate that the measurement model demonstrates strong reliability, convergent validity and discriminant validity, supporting its suitability for subsequent structural model analysis.

#### Robustness and Precision Checks

To assess the stability and reliability of the findings, given the team-level structure of the data ( $N = 39$  teams; 392 individuals), several robustness and precision checks were conducted. First, bootstrapping with 5,000 resamples was used to evaluate the indirect effects and the mediation mechanism. The bootstrapped 95% confidence interval for the mediation pathway (CD  $\rightarrow$  TE  $\rightarrow$  TP) was [0.071, 0.152], excluding zero and indicating a stable and statistically significant mediation effect. For the second-stage moderated mediation, conditional indirect effects were significant at low ([0.034, 0.104]), mean ([0.070, 0.150]) and high ([0.099, 0.208]) levels of TL, confirming the robustness of the moderation effect.

Second, Cohen's  $f^2$  effect sizes were computed to assess the practical significance of the structural paths. Effect sizes were small-to-medium for CD  $\rightarrow$  TP ( $f^2 = 0.09$ ), medium for CD  $\rightarrow$  TE ( $f^2 = 0.14$ ), large for TE  $\rightarrow$  TP ( $f^2 = 0.32$ ) and medium for the interaction effect (TE  $\times$  TL  $\rightarrow$  TP,  $f^2 = 0.11$ ). These values indicate that the hypothesized relationships possess meaningful explanatory power.

Third, multicollinearity diagnostics were examined using VIFs. All predictors exhibited low VIF values—CD (1.08), TE (1.15), TL (1.12) and TE  $\times$  TL (1.21)—well below the conservative threshold of 3.0 (Hair et al., 2014). Corresponding tolerance values (0.83–0.93) further indicate that multicollinearity does not threaten model stability.

Collectively, these robustness and precision checks demonstrate that the mediation, moderation and moderated mediation results are stable and reliable, and not attributable to sampling limitations or model misspecification, thereby supporting the integrity of the structural model.

#### Sensitivity Analyses

To assess model robustness and rule out alternative explanations, three sensitivity analyses were conducted.

##### ALTERNATIVE MODEL 1: DIRECT-EFFECTS-ONLY MODEL

When the mediator (TE) was excluded, the direct effect of CD on TP increased ( $\beta = 0.223$ ,  $p < .001$ ) relative to the partial mediation model ( $\beta = 0.113$ ,  $p = .005$ ). This pattern indicates that TE accounts for a substantial portion of the CD–TP relationship, supporting its role as a key explanatory mechanism.

##### ALTERNATIVE MODEL 2: EXCLUDING CONTROL VARIABLES

Removing demographic controls (age, gender, experience, education and firm size) did not materially alter the estimated path coefficients: CD  $\rightarrow$  TP ( $\beta = 0.116$  vs. 0.113), CD  $\rightarrow$  TE ( $\beta = 0.255$  vs. 0.253) and TE  $\rightarrow$  TP ( $\beta = 0.438$  vs. 0.436). These results indicate that the observed relationships are not driven by the inclusion of control variables and reflect substantive theoretical effects.

##### ALTERNATIVE MODEL 3: TL AS A PARALLEL MEDIATOR

Testing TL as an additional mediator alongside TE produced a non-significant indirect effect through TL (95% CI: [-0.012, 0.045]). This finding supports the theoretical specification of TL as a boundary condition (moderator) rather than a parallel mediation mechanism, reinforcing the conceptual distinction between TE as a psychological

translation mechanism and TL as a behavioural infrastructure that conditions the efficacy–performance relationship.

Collectively, these sensitivity analyses confirm the robustness of the proposed triadic model and support the specification of TE as the mediator and TL as the moderator.

### Evaluation of Structural Model

The structural model was evaluated using AMOS, following established goodness-of-fit guidelines (Hu & Bentler, 1999). The model included four constructs: CD, TE, TL and TP. Model fit was assessed through a series of confirmatory factor analyses. The results indicated a satisfactory and superior fit relative to alternative model specifications, as evidenced by the following indices: GFI = 0.892, CFI = 0.942, NFI = 0.898, CMIN/df = 2.192, SRMR = 0.05 and RMSEA = 0.055.

### Hypothesis Testing

#### Direct Effect and Indirect Effect

Structural equation modelling results indicate that CD is positively associated with both TP ( $\beta = 0.110, p < .005$ ) and TE ( $\beta = 0.247, p < .005$ ), supporting  $H_1$  and  $H_2$ . These findings are consistent with prior research documenting the performance benefits of cognitive heterogeneity in knowledge-intensive contexts (Ishikawa, 2025; Mathuki & Zhang, 2024). In addition, TE exhibited a significant positive relationship with TP ( $\beta = 0.435, p < .005$ ), providing support for  $H_3$  and aligning with meta-analytic evidence linking collective efficacy beliefs to team outcomes (Chen et al., 2025; Porter et al., 2004) (see Table 4).

The indirect effect of CD on TP through TE was significant ( $\beta = 0.124, 95\% \text{ CI } [0.071, 0.152], p < .005$ ), supporting the mediation hypothesis ( $H_4$ ). The bootstrapped confidence interval excluded zero, confirming the stability of the mediation pathway. This finding is consistent with SCT, which posits that collective efficacy beliefs function as psychological mechanisms translating diverse cognitive inputs into coordinated actions (Mastrorilli et al., 2025; Uraon et al., 2024) (see Table 4).

#### Results of Moderated Mediation

The moderated mediation hypothesis was tested using SPSS PROCESS Macro Model 14 (Hayes, 2018). As reported in Table 5, the indirect effect of CD on TP through TE was contingent on the level of TL. Specifically, the conditional indirect effect was significant at high ( $\beta = 0.150, 95\% \text{ CI } [0.097, 0.208]$ ) and mean ( $\beta = 0.108, 95\% \text{ CI } [0.069, 0.150]$ ) levels of TL, supporting  $H_5$  (see Table 5 and Figure 2).

### Discussion

This study examined how CD influences TP in India's banking sector by investigating the mediating role of TE and the moderating role of TL. The results demonstrate that CD enhances TP both directly and indirectly through TE and that TL strengthens the efficacy–performance relationship. Collectively, these findings advance SCT in three important ways. First, they establish TE as the psychological mechanism through which diverse cognitive inputs are translated into coordinated collective action. Second, they identify TL as a critical boundary condition that determines when efficacy beliefs are effectively

**Table 4.** Results of Direct and Indirect Effects.

Effect of Control Variables					
Paths		$\beta$	SE	t Value	p Value
Age → Team performance		0.019	0.046	0.417	.677
Gender → Team performance		−0.120	0.082	−1.464	.144
Experience → Team performance		0.028	0.036	0.781	.435
Education → Team performance		0.045	0.041	1.107	.269
Firm size → Team performance		0.034	0.047	0.729	.466
Direct Effects					
Hypothesis	Path	Estimate	SE	t Value	p Value
$H_1$	CDT → TP	0.110	0.041	2.663	.008
$H_2$	CDT → TE	0.247	0.049	5.007	*
$H_3$	TE → TP	0.435	0.041	10.493	*
Indirect Effect					
Hypothesis	Path	Estimate	LLCI	ULCI	p Value
$H_4$	CDT → TE → TP	0.124	0.080	0.169	.012

Source: Primary data.

Notes: N = 392 individuals nested in 39 teams.

\* $p < .005$ .

Bootstrapped samples = 5,000.

LLCI: Lower-level confidence interval; ULCI: Upper-level confidence interval.

**Table 5.** Results of Moderated Mediation.

Results of Moderated Mediation Team Efficacy (Mediator)							
Values of Moderator (Team Learning)	Conditional Indirect Effect	Boot SE	LLCI	ULCI	R <sup>2</sup>	R <sup>2</sup> Change	F
-SD	0.065	0.018	0.033	0.105	0.404	0.030	19.104
Mean	0.108	0.021	0.069	0.150			
+SD	0.150	0.029	0.097	0.208			

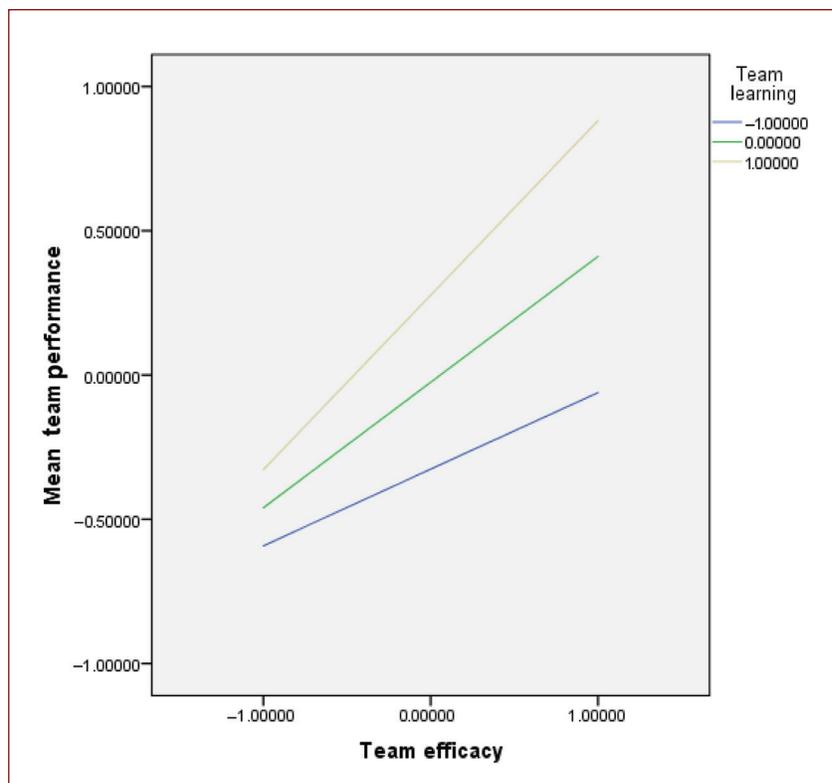
  

Index of moderated mediation					
Index	Boot SE	LLCI	ULCI		
Team learning	0.043	0.012	0.021	0.069	

**Source:** Primary data.

**Notes:** N = 392 individuals nested in 39 teams.

\*p < .005.



**Figure 2.** Moderating Effect of TL on the Relationship Between TE and TP.

**Source:** Primary data.

**Note:** Conditional slopes plotted at ±1 SD from the mean of team learning.

converted into performance outcomes. Third, they extend SCT to high-power-distance, collectivist contexts, highlighting how observational learning and hierarchical norms shape the functioning of cognitively diverse teams.

**Cognitive Diversity in the Indian Banking Context**

Consistent with prior research conducted in Western contexts (Martins & Sohn, 2022; Wallrich et al., 2024), CD

was positively associated with TP, indicating that heterogeneous thinking styles facilitate creativity, multidimensional problem-solving and adaptive flexibility. Importantly, the present study demonstrates that CD operates effectively within the Indian banking context, despite the presence of hierarchical norms, collectivist values and strong relational interdependence (Anand & Raghuvanshi, 2024; Vargas & Ali, 2022).

These findings suggest an evolving organizational orientation towards valuing divergent viewpoints,

particularly in environments characterized by digital transformation and high task complexity. Moreover, the results indicate that SCT's reciprocal determinism manifests differently across cultural contexts: in high-power-distance settings, observational learning and vicarious modelling, rather than direct debate, appear to be the primary mechanisms through which diverse perspectives are integrated. When supported by appropriate psychological and behavioural infrastructure, such teams can leverage CD to achieve meaningful performance benefits.

### *Team Efficacy as the Psychological Translation Mechanism*

The strong mediating role of TE reinforces SCT's core proposition that collective belief systems regulate behaviour and performance outcomes (Bandura, 1991). This study makes a distinct theoretical contribution by empirically establishing TE as the psychological mechanism through which CD enhances TP. Consistent with SCT, CD strengthens TE through four interrelated processes: mastery experiences, as teams successfully integrate diverse inputs; vicarious experiences, as members observe effective utilization of varied viewpoints; social persuasion, which reinforces recognition and acceptance of diverse strengths; and positive affective states, arising from collaborative problem-solving (Bandura, 1997).

These mechanisms explain why CD fosters shared confidence in collective capability rather than fragmentation. In hierarchical contexts, where authority structures may suppress voices and reinforce compliance-oriented behaviour, TE becomes particularly critical for overcoming coordination inertia. Strong efficacy beliefs reduce excessive reliance on formal ranks, legitimize cross-level participation and encourage team members to act on diverse insights even in the absence of explicit authorization. Consequently, TE functions as the channel through which diversity-driven cognitive resources are transformed into shared competence, coordinated action and sustained performance. In this way, TE not only mediates the CD–TP relationship but also serves as a psychological counterbalance to hierarchical rigidity, enabling CD to operate as a strategic asset rather than a source of tension.

### *Team Learning as the Conditional Activator*

TL adds critical nuance to the literature by functioning as a boundary condition within the CD–TE–TP pathway. Although TL is well established as a driver of reflective adaptation and collective competence (Edmondson & Harvey, 2025), its role in conditioning the efficacy–performance relationship has received limited empirical attention. The results indicate that TE alone is insufficient; its performance benefits depend on the team's learning orientation.

Teams with low learning may possess confidence yet rely on habitual routines, thereby underutilizing diverse cognitive inputs. In contrast, teams with high learning engage in feedback-seeking, error discussion and experimentation, which facilitate the integration of diverse perspectives and the translation of efficacy beliefs into adaptive performance strategies (Lam et al., 2017; Rauter et al., 2018). This finding refines SCT by demonstrating that TL activates the efficacy–performance relationship, creating conditions under which efficacy beliefs are continually recalibrated through mastery and vicarious learning (Bandura, 1997; Yoon & Kayes, 2016). Thus, TL regulates the strength of the reciprocal loop linking efficacy, behavioural modelling and performance.

### *Comparative Insights: Beyond Western Contexts*

Unlike studies that primarily replicate prior findings, this research offers contextual and comparative insights by demonstrating how the CD–TE–TL mechanism operates differently across cultural settings. Table 6 provides a structured comparison of these contextual distinctions.

These comparative insights indicate that while SCT's reciprocal determinism is universal, its manifestations vary across cultural settings. In high-power-distance, collectivist environments, hierarchical norms, social deference and relational interdependence shape how diverse viewpoints are expressed and integrated. Accordingly, TE develops less through an open debate typical of Western, low-power-distance teams and more through observational learning, modelling and collective problem-solving.

**Table 6.** Comparison of CD Mechanisms: Western Versus Indian Banking Contexts.

Insight	Western Evidence	Indian Banking Context (This Study)
CD → TP relationship	Supported, but often shows early-stage conflict before synergy emerges (Harrison et al., 2002; Martins & Sohn, 2022).	Supported, with positive effects strengthened by team efficacy despite hierarchical constraints
Mediation via TE	Rarely examined directly (Gully et al., 2002; Mathuki & Zhang, 2024).	Strong empirical mediator translating diverse cognitions into coordinated actions
Moderation via TL	Conceptually suggested but under-tested (Edmondson, 1999; Yoon & Kayes, 2016).	Empirically validated; emerges as a culturally critical boundary condition

Together, these findings enrich SCT by demonstrating that collective action is culturally embedded, emerging from the interaction of CD (personal factor), efficacy beliefs (behavioural regulator) and TL (environmental enabler). This culturally grounded pathway underscores that translating diversity into performance is not automatic, but contingent on the alignment of psychological and contextual mechanisms.

## Implications

### Theoretical Contributions

This study advances the theoretical understanding of CD and TP through SC in three important ways. First, by examining CD within India's banking sector, a high-power-distance, collectivist context, the findings extend diversity research beyond Western-centric assumptions. The results demonstrate that CD can enhance performance even in hierarchical settings (Anand & Raghuvanshi, 2024; Yadav & Lenka, 2020), challenging the view that diversity inevitably generates conflicts in such cultures. When appropriate psychological mechanisms are activated, CD functions as a source of collective strength rather than division.

Second, identifying TE as a mediating mechanism deepens SCT's application in team research. By empirically establishing TE as the psychological conduit linking CD to performance, the study shows that diverse perspectives improve outcomes only when teams internalize differences as collective capability. This extends SCT by demonstrating that collective agency emerges through shared mastery experiences and social modelling processes triggered by cognitive variation.

Third, demonstrating that TL moderates the efficacy–performance relationship introduces a conditional pathway within SCT. The findings indicate that efficacy alone is insufficient without a learning climate that supports reflection, experimentation and behavioural adaptation (Edmondson & Harvey, 2025). The moderated mediation model reveals that diversity-driven performance gains depend on teams' ability to translate shared confidence into adaptive action, thereby enriching SCT's reciprocal determinism by identifying TL as the environmental condition that activates and strengthens efficacy-based pathways.

### Implications for Practice

The moderated mediation results ( $H_3$ ) demonstrate that CD enhances TP primarily by strengthening TE and that this indirect effect becomes substantially stronger when TL is high. These findings indicate that diversity alone does not automatically yield performance benefits. Rather, banking institutions must intentionally cultivate shared efficacy and embed structured learning routines to ensure that diverse perspectives are translated into coordinated and effective actions. The framework presented in Table 7 offers actionable,

evidence-based guidance for banking leaders seeking to leverage diversity as a strategic performance capability.

Building on these insights, the following evidence-based practices offer actionable guidance for banking leaders seeking to translate CD into sustained performance gains.

1. *Strategic team composition*: Managers should move beyond demographic criteria and design teams for cognitive complementarity, incorporating analytical, intuitive and creative thinking styles through recruitment, internal mobility and targeted role rotation. Brief cognitive mapping sessions can help teams recognize and integrate these differences early. *Why it matters*: greater CD is associated with stronger innovation pipeline outcomes and improved compliance audit performance.
2. *Building TE through early wins*: Leaders should deliberately cultivate TE by assigning short-cycle, achievable projects, facilitating peer modelling of effective problem-solving and recognizing collective achievements. These practices generate early mastery experiences that strengthen shared confidence. *Why it matters*: higher TE is linked to faster customer complaint resolution and improved adherence to service-level agreements.
3. *Institutionalizing TL routines*: Banks should embed structured learning routines, such as after-action reviews following credit decisions or service failures and brief reflection huddles after key milestones, rather than relying on ad hoc learning. Allocating protected reflection time supports consistent knowledge integration. *Why it matters*: Strong learning routines reduce the time to competency for new processes and increase employee-driven improvement initiatives.
4. *Leadership development for inclusive dialogue*: In hierarchical banking environments, leaders should normalize their voices by using structured turn-taking, encouraging respectful disagreement and asking reflective questions that surface alternative viewpoints. These behaviours legitimize participation without undermining formal authority. *Why it matters*: Inclusive leadership improves decision quality and reduces operational errors.
5. *Aligning performance systems with collaborative learning*: Performance appraisal and reward systems should include criteria for leveraging diverse perspectives and contributing to TL, alongside individual targets. Modest weighting of team-based outcomes reinforces collective accountability. *Why it matters*: aligned incentives support higher customer satisfaction and stronger digital adoption.

Taken together, these interventions highlight the importance of treating CD as a dynamic strategic capability rather than a static structural attribute. Banking institutions that invest

**Table 7.** Managerial Diagnostic Dashboard for Leveraging CD in Banking Teams.

Construct	Diagnostic Indicators	Objective Performance Metrics (Banking KPIs)	Assessment Frequency	Action Threshold & Interventions
CD	<ul style="list-style-type: none"> <li>Variations in problem-solving styles across teams</li> <li>Functional background mix</li> <li>Balance of analytical/intuitive thinkers</li> </ul>	<ul style="list-style-type: none"> <li>Innovation pipeline (of new process improvements)</li> <li>Decision quality index (error rates in credit decisions)</li> </ul>	Quarterly	If < 3.5/5: <ul style="list-style-type: none"> <li>Review recruitment to increase cognitive mix</li> <li>Rotate staff across functions</li> <li>Cross-train specialists</li> </ul>
TE	<ul style="list-style-type: none"> <li>Shared confidence in handling complex tasks</li> <li>Belief in achieving collective goals</li> <li>Mutual trust in capability</li> </ul>	<ul style="list-style-type: none"> <li>Project success rate</li> <li>Customer complaint resolution time (avg. days)</li> <li>SLA compliance rate (%)</li> </ul>	Quarterly	If < 3.8/5: <ul style="list-style-type: none"> <li>Assign quick-win projects</li> <li>Facilitate peer-modelling sessions</li> <li>Recognize team achievements</li> </ul>
TL	<ul style="list-style-type: none"> <li>Frequency of reflection routines</li> <li>Openness in discussing errors</li> <li>Active knowledge sharing</li> <li>Cross-functional learning</li> </ul>	<ul style="list-style-type: none"> <li>Knowledge-sharing frequency (documented best practices)</li> <li>Time to competency for new processes (weeks)</li> <li>Training hours per quarter</li> </ul>	Biweekly	If < 3.7/5: <ul style="list-style-type: none"> <li>Mandate structured after-action reviews</li> <li>Allocate 10% project time for reflection</li> <li>Implement an error-logging system with focus on learning</li> </ul>
TP	<ul style="list-style-type: none"> <li>Decision quality</li> <li>Timeliness of task completion</li> <li>Stakeholder satisfaction</li> <li>Innovation outputs</li> </ul>	<ul style="list-style-type: none"> <li>Net promoter score (NPS)</li> <li>Avg. transaction processing time</li> <li>Error/rework rate (%)</li> <li>Customer satisfaction score</li> <li>Audit compliance rate</li> </ul>	Monthly	If declining: <ul style="list-style-type: none"> <li>Reassess CD–TE–TL alignment</li> <li>Identify coordination bottlenecks</li> <li>Adjust team composition or learning routines</li> </ul>

**Notes:** This dashboard integrates perceptual measures (left column) with objective banking performance metrics (centre column) to support comprehensive monitoring.

Thresholds are based on sample mean scores; organizations should calibrate according to their operational context.

in the psychological and structural enablers identified in this study are more likely to unlock the performance potential of cognitively diverse teams, yielding improvements in customer satisfaction, operational efficiency and regulatory compliance.

Managerial priorities emerging from this study are fourfold:

1. Design teams for cognitive complementarity, not merely demographic diversity.
2. Deliberately build TE through structured early wins, peer modelling and recognition.
3. Institutionalize TL routines (e.g., after-action reviews, reflection time, knowledge sharing) tied to performance metrics.
4. Align performance systems to reward collaborative learning and effective use of diverse perspectives.

## Limitations and Future Research Directions

This study advances the understanding of how CD translates into TP through TE and TL. Nevertheless, several

limitations delineate the boundaries of these findings and point to important avenues for future research.

### Sample Size and Generalizability

While the team-level sample is modest, robust ICC values, within-team agreement and bootstrapped confidence intervals provide strong statistical justification for the findings. More importantly, the study's focus on India's banking sector, characterized by high-power-distance and collectivist values (Hofstede, 2001; Pereira & Malik, 2015), provides a theoretically appropriate context for testing SCT but may limit transferability to low-hierarchy or individualist settings. Hierarchical norms in such contexts may suppress voice behaviours (Morrison, 2014) and shape how CD is expressed and integrated, potentially conditioning the applicability of the proposed model across cultures.

### Future Research Directions

Future studies should replicate the model using larger team samples (e.g.,  $n > 100$  teams) across diverse cultural contexts. Comparative research contrasting high-power-distance environments (e.g., China, Malaysia and India) with low-power-distance (e.g., Scandinavia, the

Netherlands and Australia) settings would clarify whether efficacy formation and learning-based moderation represent universal mechanisms or culturally contingent processes. Testing the framework in other regulated, high-interdependence sectors, such as healthcare (multidisciplinary surgical teams), defence (cross-functional military units) and public administration, would further establish the model's transportability beyond banking.

### *Research Design and Causality*

Although the three-wave, time-lagged design reduces concerns related to reverse causality and common method bias, it does not permit definitive causal inference. The design captures relationships at discrete measurement points but cannot reveal how TE and TL evolve across repeated performance cycles. Consequently, important temporal questions remain unresolved, such as whether CD initially generates friction before yielding synergy as shared mental models develop and whether learning routines strengthen or decay over time.

### *Future Research Directions*

Longitudinal designs tracking teams over 6–12 months would enable the examination of how TE and TL evolve through repeated mastery experiences (Bandura, 1997). Randomized controlled trials introducing efficacy-building interventions (e.g., structured mastery experiences or peer-modelling sessions) could provide a stronger causal evidence for TE's mediating role. Quasi-experimental field studies comparing organizations that institutionalize learning routines with matched controls would further demonstrate real-world effectiveness. Experience sampling methods capturing daily or weekly team interactions could illuminate when diverse perspectives are voiced or suppressed and how efficacy fluctuates during ongoing projects.

### *Measurement and Method Variance*

Despite procedural safeguards such as temporal separation and multiple respondents, the study relies primarily on perceptual measures. While TE and TL are inherently perceptual constructs (Bandura, 1997; Edmondson, 1999), the absence of objective performance indicators or behavioural observations limits measurement triangulation. This leaves open questions regarding how teams enact diversity, build confidence and engage in learning behaviours in real time.

### *Future Research Directions*

Future studies should adopt multi-method approaches that combine perceptual measures with objective indicators such as error rates, customer satisfaction scores (e.g., net promoter score), process cycle times, innovation outputs and archival performance data. Behavioural observations

(e.g., video-coded team interactions) could capture how dissenting views are expressed and integrated, while 360-degree assessments involving leaders, peers and team members would strengthen construct validity. Such designs would provide richer insights into how teams operationalize CD, efficacy and learning (Harvey et al., 2019).

### *Additional Mechanisms and Boundary Conditions*

Beyond the limitations noted above, future research should examine additional mechanisms and boundary conditions that may refine the proposed triadic model. For example, testing psychological safety as a complementary mediator could clarify its role in enabling interpersonal risk-taking, while examining leadership styles may reveal how efficacy formation and learning activation are jointly shaped. Conflict management norms may further determine whether diversity leads to constructive debate or relational strain.

Incorporating demographic and functional diversity would help assess whether an alignment across these dimensions creates faultlines that weaken efficacy (Lau & Murnighan, 1998) or whether CD acts as a bridging resource. Distinguishing deep-level versus surface-level diversity (Harrison et al., 2002) may also reveal how effects evolve as teams mature. Exploring higher-order interactions (e.g.,  $TL \times leadership \times TE$ ) would further clarify the conditional dynamics embedded in SCT.

### *Technology-mediated Collaboration*

With the growing prevalence of virtual and hybrid teams, future research should examine how technology-mediated collaboration shapes the CD–TE–TP pathway. AI-enabled collaboration tools that synthesize diverse inputs may alter how teams develop efficacy and engage in learning (Edmondson & Harvey, 2025). Digital platforms may facilitate observational learning differently than face-to-face interaction, particularly in high-power-distance contexts where direct challenge is culturally constrained.

### *Future Research Directions*

Scholars should investigate whether virtual collaboration tools amplify or attenuate the relationships in the triadic model, how asynchronous communication affects the expression of diverse viewpoints and whether AI-supported integration reduces or complements the need for structured learning routines. Such work would clarify how human-centred and technology-enabled mechanisms jointly shape team dynamics.

### *Summary and Forward Path*

By systematically pursuing these research directions, scholars can strengthen the CD–TE–TL framework and

advance it from a context-specific explanation to a broader theory of team dynamics. Each avenue addresses a clearly articulated limitation while opening new theoretical and methodological opportunities, ensuring that the framework evolves alongside changing organizational realities. Collectively, this research agenda reframes CD not as a static characteristic to manage, but as a dynamic capability that can be cultivated through deliberate attention to psychological mechanisms and environmental enablers. Ultimately, this line of inquiry promises deeper insights into how teams harness CD as a sustainable source of innovation, adaptability and competitive advantage in increasingly complex environments.

## Conclusion

This study demonstrates that CD functions as a strategic performance asset in complex organizational environments when supported by two critical enablers: TE and TL. Rather than treating diversity as inherently beneficial or inevitably conflict-inducing, the findings reveal a nuanced pathway in which cognitive heterogeneity enhances TP by strengthening shared confidence in collective capability, which translates into coordinated action only when teams possess structured learning routines that enable systematic integration of diverse perspectives.

This study makes three key contributions:

- First, it advances SCT by identifying TE as the mechanism and TL as the boundary condition through which CD affects TP.
- Second, it clarifies mixed findings in diversity and team research by showing that CD improves performance only when supported by shared efficacy and learning routines.
- Third, it extends this work to Indian banking, a high-power-distance, collectivist context, demonstrating how diversity is integrated through observational learning rather than direct debate.

From a managerial perspective, the findings indicate that organizations must move beyond symbolic diversity initiatives towards capability-oriented approaches. Managers should prioritize: (a) designing teams for cognitive complementarity, (b) deliberately building TE through structured mastery experiences and social modelling and (c) institutionalizing TL through reflection routines, after-action reviews and performance systems that reward collaborative learning. Without these enablers, CD remains an unrealized potential rather than an operational capability.

The proposed model is expected to operate most strongly in contexts characterized by high task interdependence, knowledge-intensive work, meaningful cognitive heterogeneity and minimal structural suppression of TL and voice. While the study's focus on Indian banking

and its modest team-level sample (39 teams) provides theoretically rich insights, future research should replicate these mechanisms across larger samples, diverse cultural contexts and other high-interdependence sectors and examine how virtual and hybrid collaboration technologies shape the diversity–efficacy–learning pathway.

Taken together, the evidence shows that CD is neither inherently beneficial nor problematic; its performance consequences depend fundamentally on whether organizations cultivate the psychological confidence and behavioural routines required to harness it effectively.

## Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

## Funding

The authors received no financial support for the research, authorship and/or publication of this article.

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## Appendix

### Measurement Items

(All items are measured on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree))

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#### Cognitive diversity (Van der Vegt & Janssen, 2003)

- CD1: Team members differ in the way they approach problems.
- CD2: Team members have different thinking styles.
- CD3: Team members have varied knowledge and skills.
- CD4: Team members approach tasks from different angles.

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#### Team efficacy (Mosley et al., 2008)

- TE1: Our team has confidence in itself.
- TE2: Our team believes it can be very productive.
- TE3: Our team can solve difficult problems.
- TE4: Our team expects to be known as a high-performing team.
- TE5: Our team feels it can accomplish any task.
- TE6: Our team believes that difficult assignments make us better.
- TE7: Our team is confident about working on challenging projects.

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#### Team performance (Zhang et al., 2011) (Leader-rated)

- TP1: This team meets its performance goals.
- TP2: This team accomplishes its tasks effectively.
- TP3: This team produces high-quality work.
- TP4: This team completes its work on time.
- TP5: This team is effective in coordinating members' efforts.
- TP6: This team demonstrates strong problem-solving capabilities.
- TP7: Overall, this team performs well.

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#### Team learning (Edmondson, 1999)

- TL1: We regularly take time to figure out ways to improve our work processes.
- TL2: Team members often speak up to test assumptions about issues under discussion.
- TL3: Team members ask each other questions to better understand different perspectives.
- TL4: We seek information from others outside the team.
- TL5: Team members discuss mistakes openly to learn from them.
- TL6: Team members provide each other with constructive feedback.
- TL7: The team frequently reflects on its performance.

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**Note:** Minor wording adaptations were made to fit the banking context while maintaining construct validity.