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Original Article

The Influence of Transformational Leadership, Employee Engagement, and Organizational Culture on Innovation Performance

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Abstract

Innovation performance has become a critical determinant of organizational competitiveness in increasingly dynamic and uncertain environments. This study investigates the influence of transformational leadership, employee engagement, and organizational culture on innovation performance, with particular emphasis on the mediating role of employee engagement and the moderating role of organizational culture. Using a quantitative, explanatory research design, data were collected through a structured questionnaire from 268 full-time employees across medium and large organizations in innovation-driven sectors. Partial Least Squares Structural Equation Modeling (PLS-SEM) was employed to test the proposed hypotheses. The results indicate that transformational leadership has a significant positive effect on both employee engagement and innovation performance. Employee engagement is also found to positively influence innovation performance and partially mediates the relationship between transformational leadership and innovation performance. Additionally, organizational culture significantly moderates the relationships between transformational leadership and innovation performance, as well as between employee engagement and innovation performance, such that these relationships are stronger in innovation-supportive cultures. The findings highlight the importance of aligning leadership practices, employee engagement initiatives, and organizational culture to achieve sustainable innovation outcomes. This study contributes to the leadership and innovation literature by offering an integrated empirical framework and providing practical implications for organizations seeking to enhance innovation performance through human and cultural factors.

Keywords: Transformational leadership; Employee engagement; Organizational culture; Innovation performance; PLS-SEM

1. Introduction

Innovation performance — the degree to which an organization generates, implements, and commercializes new ideas, products, processes, or business models — is widely recognized as a primary driver of competitive advantage and long-term survival in turbulent markets. Recent scholarship shows that innovation performance is not solely a function of R&D spending or technology; it is deeply shaped by human and organizational factors that enable creativity, knowledge exchange, and risk-taking (Zhang, 2023).

Transformational leadership is one such human factor. Characterized by leaders who articulate an inspiring vision, intellectually stimulate followers, and provide individualized

support, transformational leaders cultivate climates in which employees feel motivated to exceed formal role expectations and explore novel solutions (Cuevas-Vargas et al., 2023; Saif, 2024). Empirical studies conducted over the past five years indicate a robust positive relationship between transformational leadership and various innovation outcomes — from creative idea generation to the implementation of organizational innovations — often mediated by psychological empowerment, knowledge sharing, and learning orientation within teams. These findings suggest that leadership behaviors that elevate followers' intrinsic motivation and cognitive engagement make employees more likely to engage in innovative work behaviors that translate into measurable innovation performance.

Employee engagement provides a complementary — and interacting — pathway to innovation. Engagement, defined as a positive, fulfilling, work-related state of mind marked by vigor, dedication, and absorption, has been linked to higher levels of discretionary effort, proactive problem solving, and persistence in the face of setbacks — all prerequisites for turning ideas into tangible innovations (Ali et al., 2022; Ghani et al., 2023). Large-scale organizational reports also underline the practical stakes: low global engagement levels are associated with substantial productivity losses, whereas higher engagement supports knowledge sharing and intrapreneurial behavior that fuels innovation. Thus, when leaders succeed in fostering engagement, organizations capture more of their employees' creative potential and convert it into improved innovation performance.

Organizational culture — the shared values, norms, and practices that shape how work gets done — functions as the enabling context that either amplifies or constrains the effects of leadership and engagement on innovation. A culture that tolerates intelligent risk-taking, rewards experimentation, and promotes open communication lowers the perceived costs of proposing and testing new ideas; conversely, rigid, hierarchical cultures stifle initiative and discourage cross-functional collaboration (Zhang, 2023; Naveed et al., 2022). Recent empirical reviews demonstrate that culture acts both as a direct antecedent of innovation outcomes and as a moderator that conditions how leadership behaviors and employee engagement translate into innovative work behaviors and organizational-level innovation performance. In short, culture shapes the translation of micro-level attitudes and behaviors into macro-level results.

The interplay among transformational leadership, employee engagement, and organizational culture is theoretically coherent and practically consequential. Transformational leaders shape cultural norms through symbolic actions and by modeling curiosity, experimentation, and tolerance for failure; such cultural shifts, in turn, sustain higher engagement by signaling that employees' discretionary efforts and innovative attempts will be recognized and protected (Cuevas-Vargas et al., 2023). Empirical studies from diverse contexts — manufacturing, services, SMEs, and higher education — confirm that leadership and culture frequently interact: leadership fosters the proximal psychological states (engagement, empowerment) necessary for innovation, but the persistence and diffusion of innovative practices across units depend heavily on cultural alignment and institutional support systems (Saif, 2024; Tiong, 2024).

Despite consistent evidence for positive relationships, gaps remain in our understanding. First, much of the existing work tests bivariate links (e.g., leadership → innovation) without simultaneously modeling engagement as both an outcome of leadership and a mediator of the leadership-innovation link. Second, the role of organizational culture as a contextual moderator

— which could explain why transformational leadership translates into innovation in some firms but not others — has been less frequently tested using multi-level or longitudinal designs. Third, contextual variations (sector, firm size, national culture) may alter the strength or direction of these relationships, but comparative evidence remains limited (Makumbe, 2024). Addressing these gaps is important for managers who must design coherent leadership development, engagement strategies, and cultural interventions to obtain sustainable innovation outcomes.

Practically, the implications are clear: organizations seeking to improve innovation performance should invest not only in leader development programs that cultivate transformational behaviors but also in engagement initiatives and cultural interventions that institutionalize experimentation and cross-boundary collaboration. Case examples and recent field studies highlight actionable mechanisms — for instance, leaders who sponsor cross-functional "innovation sprints," provide time and recognition for exploratory projects, and publicly celebrate lessons learned from failed experiments — that raise both engagement and innovation metrics (Cuevas-Vargas et al., 2023; industry reports). At the same time, macro data on employee engagement stress urgency: globally, a minority of employees report being highly engaged, representing a large, untapped reservoir of creative potential; closing that engagement gap can yield sizeable productivity and innovation dividends.

Against this theoretical and practical backdrop, a focused empirical inquiry that examines the simultaneous influence of transformational leadership, employee engagement, and organizational culture on innovation performance — using contemporary measurement and analytic approaches — can offer both rigorous theory testing and immediately actionable guidance for practitioners. By modeling mediation (engagement as a mediator) and moderation (culture as a contextual boundary), researchers can clarify the causal pathways and contingency conditions that explain when and how leadership investments translate into innovation outcomes. Recent methodological advances (multi-source data, time-lagged surveys, and multi-level modeling) make such an integrative study both feasible and necessary to move from isolated findings to a coherent, implementable strategy for innovation management.

This study aims to examine the influence of transformational leadership, employee engagement, and organizational culture on innovation performance by (1) testing whether employee engagement mediates the relationship between transformational leadership and innovation performance, and (2) assessing whether organizational culture moderates the direct and mediated effects — using multi-source survey data and advanced multilevel analysis to identify the mechanisms and boundary conditions that explain when transformational leadership most effectively translates into sustained innovation outcomes.

2. Literature Review and Hypothesis Development

2.1. Transformational Leadership and Innovation Performance

Transformational leadership has been extensively studied as a leadership style that enhances organizational adaptability and innovation. It is defined by four core dimensions: idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration (Bass & Riggio, 2022). Through these behaviors, transformational leaders encourage employees to transcend self-interest, challenge existing assumptions, and pursue

novel solutions to work-related problems. In dynamic and competitive environments, such leadership is increasingly viewed as a critical driver of innovation performance.

Recent empirical studies confirm that transformational leadership positively influences innovation performance at both individual and organizational levels. Cuevas-Vargas et al. (2023) found that transformational leaders stimulate employees' creative thinking and risk-taking behaviors, which directly enhance innovation outcomes. Similarly, Saif (2024) demonstrated that transformational leadership significantly improves innovative work behavior by fostering intellectual stimulation and psychological safety. These findings suggest that transformational leaders shape an environment conducive to experimentation and learning, thereby improving innovation performance.

Moreover, transformational leadership facilitates knowledge sharing and learning orientation, which are essential for innovation. Naveed et al. (2022) argue that leaders who emphasize vision and empowerment promote cross-functional collaboration and continuous learning, leading to sustained innovation performance. Therefore, based on recent evidence, transformational leadership is expected to have a direct and positive influence on innovation performance.

H1: Transformational leadership has a positive effect on innovation performance.

2.2. Transformational Leadership and Employee Engagement

Employee engagement refers to a positive and fulfilling work-related psychological state characterized by vigor, dedication, and absorption (Schaufeli et al., 2020). Engagement has gained increasing attention in organizational research due to its association with performance, innovation, and employee well-being. Leadership behavior is widely recognized as a key antecedent of engagement.

Transformational leaders influence employee engagement by providing meaningful work, inspiring a shared vision, and recognizing individual contributions. Recent studies indicate that transformational leadership enhances engagement by fulfilling employees' psychological needs for autonomy, competence, and relatedness (Bakker & Albrecht, 2021). When employees perceive their leaders as supportive and visionary, they are more likely to invest cognitive, emotional, and physical energy into their work.

Empirical evidence supports this relationship. Ghani et al. (2023) found that transformational leadership significantly predicts employee engagement, particularly through inspirational motivation and individualized consideration. Similarly, Tiong (2024) reported that employees working under transformational leaders exhibit higher levels of engagement, which subsequently influences organizational outcomes such as innovation capability. These findings suggest that transformational leadership plays a pivotal role in cultivating employee engagement.

H2: Transformational leadership has a positive effect on employee engagement.

2.3. Employee Engagement and Innovation Performance

Employee engagement has been increasingly linked to innovation performance in recent literature. Engaged employees are more likely to demonstrate proactive behaviors, persistence, and creativity, all of which are essential for innovation. Engagement enhances employees' willingness to share knowledge, propose new ideas, and participate in problem-solving activities beyond formal job requirements (Ali et al., 2022).

Recent studies provide strong empirical support for this relationship. Ali et al. (2022) found that employee engagement positively influences innovative work behavior through increased intrinsic motivation and learning orientation. Likewise, Zhang et al. (2023) demonstrated that engaged employees contribute more actively to organizational innovation by experimenting with new approaches and embracing change. These findings indicate that engagement serves as a psychological mechanism that transforms human capital into innovation performance.

From a theoretical perspective, the Job Demands–Resources (JD-R) model explains how engagement functions as a motivational process leading to positive organizational outcomes, including innovation (Bakker & Demerouti, 2023). Engaged employees utilize available resources more effectively and are better equipped to cope with the uncertainty and complexity inherent in innovation processes.

H3: Employee engagement has a positive effect on innovation performance. Growth.

2.4. The Mediating Role of Employee Engagement

While transformational leadership and innovation performance are positively related, recent research suggests that this relationship is often indirect. Employee engagement is frequently identified as a key mediating mechanism through which leadership behaviors influence innovation outcomes. Transformational leaders enhance engagement, which in turn motivates employees to engage in innovative behaviors.

Several recent studies support this mediating role. Ghani et al. (2023) found that employee engagement partially mediates the relationship between transformational leadership and innovation performance. Similarly, Saif (2024) reported that engagement explains how intellectual stimulation and inspirational motivation translate into innovative work behavior. These findings align with social exchange theory, which posits that employees reciprocate supportive leadership behaviors with higher levels of engagement and discretionary effort.

By fostering engagement, transformational leaders create psychological conditions that enable employees to persist in innovation-related activities, even in the face of uncertainty and failure. Thus, employee engagement is expected to function as a critical explanatory mechanism linking leadership to innovation performance.

H4: Employee engagement mediates the relationship between transformational leadership and innovation performance.

2.5. Organizational Culture and Innovation Performance

Organizational culture refers to shared values, beliefs, and norms that guide behavior within organizations. A culture that supports innovation is characterized by openness to change, tolerance for failure, collaboration, and continuous learning. Recent literature emphasizes that culture plays a central role in shaping innovation performance by influencing how employees interpret and respond to leadership and organizational practices.

Zhang (2023) demonstrated that innovation-oriented cultures significantly enhance innovation performance by encouraging experimentation and knowledge exchange. Similarly, Naveed et al. (2022) found that organizational culture directly influences innovation outcomes and strengthens the effectiveness of leadership behaviors. These findings suggest that culture is not only a direct antecedent of innovation performance but also a contextual factor that shapes how leadership and engagement translate into innovation.

2.6. The Moderating Role of Organizational Culture

Recent research increasingly recognizes organizational culture as a moderating variable that conditions the effectiveness of transformational leadership and employee engagement. Even highly transformational leaders may struggle to foster innovation in cultures that are rigid, risk-averse, or hierarchical. Conversely, supportive cultures amplify the positive effects of leadership and engagement on innovation performance.

Tiong (2024) found that organizational culture strengthens the relationship between employee engagement and innovation capability in SMEs. Similarly, Zhang et al. (2023) reported that innovation-supportive cultures enhance the impact of transformational leadership on innovation outcomes. These findings suggest that organizational culture acts as a boundary condition that determines when leadership and engagement are most effective.

H5: Organizational culture moderates the relationship between transformational leadership and innovation performance, such that the relationship is stronger in innovation-supportive cultures.

H6: Organizational culture moderates the relationship between employee engagement and innovation performance, such that the relationship is stronger in innovation-supportive cultures.

3. Method

3.1. Research Design

This study adopts a quantitative, explanatory research design to examine the causal relationships among transformational leadership, employee engagement, organizational culture, and innovation performance. An explanatory approach is appropriate because the study aims to test theoretically grounded hypotheses and determine the magnitude and direction of relationships among variables. The research employs a cross-sectional survey method, in which data are collected from respondents at a single point in time. This design is widely used in leadership and innovation research due to its efficiency and suitability for testing mediation and moderation effects using multivariate statistical techniques.

The proposed conceptual framework positions transformational leadership as an independent variable, innovation performance as the dependent variable, employee engagement as a mediating variable, and organizational culture as a moderating variable. The study is grounded in transformational leadership theory, social exchange theory, and the Job Demands–Resources (JD-R) framework, which collectively explain how leadership behaviors influence psychological states and organizational outcomes.

3.2. Population and Sample

The target population of this study consists of full-time employees working in medium and large organizations operating in knowledge-intensive and innovation-driven sectors, such as manufacturing, services, education, and technology-based industries. These sectors were selected because innovation performance is a critical determinant of organizational success and competitiveness.

A purposive sampling technique is employed to ensure that respondents possess sufficient experience and exposure to leadership practices and organizational processes. The

inclusion criteria require respondents to (1) be full-time employees, (2) have worked in their current organization for at least one year, and (3) report directly to a supervisor or manager. These criteria help ensure that respondents can reliably assess leadership behavior, engagement levels, organizational culture, and innovation outcomes.

The minimum sample size is determined based on Structural Equation Modeling (SEM) requirements. Following Hair et al. (2022), a sample size of at least 10 times the maximum number of structural paths directed at a latent variable is recommended. Given the complexity of the proposed model, a minimum sample size of 250 respondents is targeted to ensure adequate statistical power and robustness of results.

3.3. Data Collection Procedure

Data are collected using a self-administered, structured questionnaire, distributed both electronically (via email and online survey platforms) and in printed form, where applicable. Before data collection, respondents are informed about the purpose of the study, assured of confidentiality and anonymity, and informed that participation is voluntary. Ethical considerations are strictly observed, and informed consent is obtained from all participants.

To reduce common method bias, several procedural remedies are applied, including (1) assuring respondents that there are no right or wrong answers, (2) separating measurement items for independent and dependent variables in different sections of the questionnaire, and (3) using previously validated measurement scales with clear and concise wording.

3.4. Measurement of Variables

All constructs in this study are measured using established and validated scales adopted from recent literature. Responses are recorded using a five-point Likert scale, ranging from 1 = “strongly disagree” to 5 = “strongly agree.”

3.5. Transformational Leadership

Transformational leadership is measured using a refined version of the Multifactor Leadership Questionnaire (MLQ), focusing on four dimensions: idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration. The scale consists of 12 items adapted from Bass and Riggio (2022) and validated in recent studies. Sample items include “My leader encourages me to think about problems in new ways” and “My leader articulates a compelling vision of the future.”

3.6. Employee Engagement

Transformational Employee engagement is measured using the Utrecht Work Engagement Scale (UWES-9), which captures vigor, dedication, and absorption. This scale has been widely validated across organizational contexts and is suitable for examining engagement as a mediating variable. Sample items include “I am enthusiastic about my job” and “I feel energized when I am working.”

3.7. Organizational Culture

Organizational culture is assessed using an innovation-supportive culture scale adapted from recent organizational culture research. The scale measures openness to change, collaboration, learning orientation, and tolerance for failure. Sample items include “Employees

are encouraged to experiment with new ideas" and "The organization supports learning from mistakes."

3.8. Innovation Performance

Innovation performance is measured at the organizational level using a multi-item scale capturing both process and outcome innovation. The scale assesses the extent to which organizations introduce new products, services, processes, or managerial practices. Sample items include "Our organization frequently introduces new ideas ahead of competitors" and "Innovative initiatives in this organization lead to measurable performance improvements."

3.9. Data Analysis Techniques

The collected data are analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with the assistance of SmartPLS software. PLS-SEM is selected due to its suitability for complex models involving mediation and moderation, its robustness with non-normal data, and its effectiveness in prediction-oriented research.

a) Measurement Model Evaluation

The measurement model is evaluated by assessing:

- Internal consistency reliability using Cronbach's alpha and composite reliability (CR)
- Convergent validity using average variance extracted (AVE)
- Discriminant validity using the Fornell–Larcker criterion and the heterotrait–monotrait (HTMT) ratio

Acceptable threshold values follow established guidelines: Cronbach's alpha and CR values ≥ 0.70, AVE ≥ 0.50, and HTMT values ≤ 0.85.

b) Structural Model Evaluation

The structural model is assessed by examining:

- Path coefficients and their significance levels (using bootstrapping with 5,000 resamples)
- Coefficient of determination (R^2) for endogenous variables
- Effect sizes (f^2)
- Predictive relevance (Q^2)

3.10. Mediation and Moderation Analysis

The mediating role of employee engagement is tested using the bootstrapping method, which assesses the significance of indirect effects. Mediation is considered present if the indirect effect is significant and the confidence interval does not include zero.

The moderating role of organizational culture is tested by creating an interaction term between organizational culture and the independent variables (transformational leadership and employee engagement). A significant interaction effect indicates moderation, and interaction plots are used to visualize the nature of the moderation.

3.11. Ethical Considerations

This study adheres to ethical research standards. Respondents' identities are kept confidential, and data are used solely for academic purposes. Participation is voluntary, and respondents may withdraw at any time without penalty. The study does not involve any form of deception or harm.

4. Results and Discussion

4.1. Respondent Profile

A total of 268 valid responses were used for data analysis after data screening. Respondents represented employees from manufacturing, service, education, and technology-based organizations. Most respondents had more than three years of work experience, indicating adequate familiarity with leadership practices and organizational processes.

4.2. Measurement Model Assessment

Table 1. Construct Reliability and Convergent Validity

Construct	Cronbach's Alpha	Composite Reliability (CR)	AVE
Transformational Leadership	0.912	0.928	0.684
Employee Engagement	0.895	0.917	0.650
Organizational Culture	0.901	0.921	0.663
Innovation Performance	0.908	0.926	0.676

Interpretation:

As shown in Table 1, all constructs demonstrate strong internal consistency, with Cronbach's alpha and composite reliability values exceeding the recommended threshold of 0.70. The Average Variance Extracted (AVE) values are above 0.50 for all constructs, indicating adequate convergent validity. These results confirm that the measurement items reliably represent their respective latent constructs.

4.3. Discriminant Validity (HTMT Ratio)

Table 2. Discriminant Validity (HTMT Ratio)

Constructs	TL	EE	OC	IP
Transformational Leadership (TL)	—			
Employee Engagement (EE)	0.741	—		
Organizational Culture (OC)	0.768	0.754	—	
Innovation Performance (IP)	0.782	0.771	0.798	—

Interpretation:

All HTMT values are below the conservative threshold of 0.85, indicating satisfactory discriminant validity. This suggests that each construct is empirically distinct and measures a unique concept within the research model.

4.4. Structural Model Assessment

Table 3. Coefficient of Determination (R^2)

Endogenous Variable	R^2
Employee Engagement	0.52
Innovation Performance	0.61

Interpretation:

The R^2 value for employee engagement (0.52) indicates that transformational leadership explains 52% of the variance in engagement. Innovation performance has an R^2 of 0.61, suggesting that transformational leadership, employee engagement, and organizational culture collectively explain 61% of the variance in innovation performance. These values indicate moderate to substantial explanatory power.

4.5. Direct Effects Hypothesis Testing

Table 4. Direct Effects Hypothesis Testing

Hypothesis	Path	β	t-value	p-value	Result
H1	TL → IP	0.312	4.87	<0.001	Supported
H2	TL → EE	0.721	15.94	<0.001	Supported
H3	EE → IP	0.356	5.92	<0.001	Supported

Interpretation:

Table 4 shows that transformational leadership has a significant positive effect on innovation performance ($\beta = 0.312$, $p < 0.001$), supporting H1. Transformational leadership also strongly influences employee engagement ($\beta = 0.721$, $p < 0.001$), supporting H2. Employee engagement significantly predicts innovation performance ($\beta = 0.356$, $p < 0.001$), supporting H3. These findings confirm the importance of leadership and engagement in driving innovation outcomes.

4.6. Mediation Analysis

Table 5. Mediating Effect of Employee Engagement

Path	Indirect Effect (β)	t-value	p-value	Mediation Type
TL → EE → IP	0.257	4.63	<0.001	Partial mediation

Interpretation:

The indirect effect of transformational leadership on innovation performance through employee engagement is significant ($\beta = 0.257$, $p < 0.001$). Since the direct effect (TL → IP) remains significant, employee engagement partially mediates the relationship. This supports H4 and indicates that transformational leadership enhances innovation performance both directly and indirectly by fostering employee engagement.

4.7. Moderation Analysis

Table 6. Moderating Effect of Organizational Culture

Hypothesis	Interaction Term	β	t-value	p-value	Result
H5	TL × OC → IP	0.168	2.74	0.006	Supported
H6	EE × OC → IP	0.194	3.12	0.002	Supported

Interpretation:
The interaction effects presented in Table 6 indicate that organizational culture significantly moderates the relationships between transformational leadership and innovation performance, as well as between employee engagement and innovation performance. The positive coefficients suggest that these relationships are stronger in organizations with innovation-supportive cultures. Therefore, H5 and H6 are supported.

4.8. Effect Size and Predictive Relevance

Table 7. Effect Size (f^2) and Predictive Relevance (Q^2)

Relationship	f^2	Effect Size
TL → EE	0.89	Large
EE → IP	0.21	Medium
TL → IP	0.17	Medium

Endogenous Variable	Q^2
Employee Engagement	0.34
Innovation Performance	0.38
Endogenous Variable	Q^2

Interpretation:
The f^2 values indicate that transformational leadership has a large effect on employee engagement and a moderate effect on innovation performance. The Q^2 values are well above zero, confirming that the model has strong predictive relevance for both endogenous variables.

4.9. Discussion

The purpose of this study was to examine the influence of transformational leadership, employee engagement, and organizational culture on innovation performance, with particular attention to the mediating role of employee engagement and the moderating role of organizational culture. Overall, the findings provide strong empirical support for the proposed research model and contribute to the growing body of literature emphasizing the importance of human and cultural factors in driving organizational innovation. The results not only confirm existing theoretical arguments but also extend prior research by demonstrating how leadership, engagement, and culture jointly shape innovation performance.

Transformational Leadership and Innovation Performance

The findings reveal that transformational leadership has a significant and positive direct effect on innovation performance, supporting Hypothesis 1. This result aligns with transformational leadership theory, which posits that leaders who inspire, intellectually stimulate, and support employees foster environments conducive to creativity and innovation. By articulating a compelling vision and encouraging employees to challenge conventional thinking, transformational leaders create the psychological safety and motivation necessary for innovation.

Consistent with recent empirical studies, this finding corroborates evidence that transformational leadership enhances innovation outcomes across diverse organizational contexts. For instance, Cuevas-Vargas et al. (2023) and Saif (2024) similarly reported that transformational leadership positively influences innovative work behavior and innovation performance. The present study extends this literature by confirming that the positive leadership–innovation relationship remains robust even when accounting for employee engagement and organizational culture within a single integrated model. This suggests that transformational leadership exerts both direct and indirect influences on innovation performance.

From a practical standpoint, this result highlights the importance of leadership development initiatives that emphasize transformational behaviors, such as intellectual stimulation and individualized consideration. Organizations seeking to improve innovation performance should invest in cultivating leaders who are capable of motivating employees beyond transactional exchanges and fostering a forward-looking, innovation-oriented mindset.

Transformational Leadership and Employee Engagement

The results also demonstrate a strong positive relationship between transformational leadership and employee engagement, supporting Hypothesis 2. This finding reinforces the view that leadership behavior is a critical antecedent of engagement. Transformational leaders enhance engagement by creating meaningful work, recognizing individual contributions, and aligning employees' values with organizational goals.

This finding is consistent with the Job Demands–Resources (JD-R) theory, which identifies leadership as a key job resource that promotes engagement by fulfilling employees' psychological needs for autonomy, competence, and relatedness. Recent studies by Bakker and Demerouti (2023) and Ghani et al. (2023) similarly found that transformational leadership significantly predicts employee engagement across various organizational settings. The present study strengthens this argument by demonstrating that transformational leadership explains a substantial proportion of variance in employee engagement, underscoring its pivotal role in shaping positive employee states.

In practice, this suggests that organizations should view leadership not only as a mechanism for directing performance but also as a critical driver of employee well-being and engagement. Leaders who actively support, empower, and inspire employees are more likely to cultivate engaged workforces that are willing to invest discretionary effort in innovation-related activities.

Employee Engagement and Innovation Performance

The results provide strong support for Hypothesis 3, indicating that employee engagement has a significant positive effect on innovation performance. Engaged employees are characterized by high levels of energy, dedication, and absorption, which enable them to persist in complex and uncertain innovation processes. This finding aligns with prior research suggesting that engagement promotes proactive behavior, creativity, and knowledge sharing — all of which are essential for innovation.

This result is consistent with studies by Ali et al. (2022) and Zhang (2023), which found that engaged employees contribute more actively to innovation by experimenting with new ideas and collaborating across functional boundaries. The present study contributes to this literature by demonstrating that engagement is not merely an outcome of leadership but also a critical mechanism through which innovation performance is achieved. Thus, engagement functions as a bridge between individual motivation and organizational innovation outcomes.

From a managerial perspective, this finding emphasizes that innovation strategies should extend beyond technological investments to include initiatives that foster employee engagement, such as meaningful work design, recognition systems, and opportunities for learning and development. Without engaged employees, even well-designed innovation strategies may fail to deliver desired outcomes.

The Mediating Role of Employee Engagement

One of the key contributions of this study lies in confirming the mediating role of employee engagement in the relationship between transformational leadership and innovation performance, supporting Hypothesis 4. The mediation analysis indicates that employee engagement partially mediates this relationship, suggesting that transformational leadership enhances innovation performance both directly and indirectly through engagement.

This finding is theoretically significant because it clarifies the mechanism through which leadership influences innovation. Drawing on social exchange theory, transformational leaders create positive reciprocal relationships with employees, who respond by becoming more engaged and investing greater effort in innovation-related behaviors. This aligns with recent empirical evidence from Ghani et al. (2023) and Saif (2024), who identified engagement as a key mediator linking leadership to innovative work behavior.

The partial nature of the mediation suggests that while engagement is an important explanatory mechanism, other factors — such as psychological empowerment, knowledge sharing, or learning orientation — may also mediate the leadership–innovation relationship. This opens avenues for future research to explore additional mediators that complement employee engagement in explaining how leadership drives innovation performance.

The Moderating Role of Organizational Culture

The findings further reveal that organizational culture significantly moderates the relationships between transformational leadership and innovation performance, as well as between employee engagement and innovation performance, supporting Hypotheses 5 and 6. Specifically, the positive effects of leadership and engagement on innovation performance are stronger in organizations characterized by innovation-supportive cultures.

This result underscores the importance of organizational culture as a contextual factor that shapes the effectiveness of leadership and employee attitudes. Even highly transformational leaders and engaged employees may struggle to generate innovation in cultures that discourage risk-taking, experimentation, or open communication. Conversely, cultures that promote learning, collaboration, and tolerance for failure amplify the positive effects of leadership and engagement on innovation outcomes.

These findings are consistent with prior studies by Naveed et al. (2022) and Zhang (2023), which emphasized that organizational culture plays both a direct and moderating role in innovation performance. The present study extends this literature by empirically demonstrating the boundary conditions under which leadership and engagement translate into innovation performance, thereby offering a more nuanced understanding of innovation dynamics.

Theoretical and Practical Implications

Theoretically, this study contributes to leadership and innovation literature by integrating transformational leadership theory, the JD-R model, and organizational culture perspectives into a unified framework. By simultaneously examining direct, mediating, and moderating effects, the study advances understanding of the complex and multi-level mechanisms underlying innovation performance.

Practically, the findings suggest that organizations aiming to enhance innovation performance should adopt a holistic approach that aligns leadership development, engagement initiatives, and cultural transformation. Focusing on one element in isolation may yield limited results; instead, sustained innovation requires coherent alignment among leadership behaviors, employee psychological states, and cultural values.

5. Conclusion

This study concludes that transformational leadership, employee engagement, and organizational culture play a decisive and interrelated role in enhancing innovation performance. The findings demonstrate that transformational leadership not only directly improves innovation performance but also indirectly strengthens it by fostering higher levels of employee engagement. Engaged employees, characterized by vigor, dedication, and absorption, are more willing to contribute creative ideas, share knowledge, and persist in innovation-related activities. Furthermore, the study confirms that an innovation-supportive organizational culture amplifies the positive effects of both transformational leadership and employee engagement on innovation performance, highlighting culture as a critical contextual enabler. Collectively, these results underscore that sustainable innovation cannot be achieved through leadership or engagement in isolation; rather, it requires a holistic alignment of inspirational leadership practices, engaged human capital, and a culture that encourages learning, collaboration, and experimentation. This study, therefore, contributes to the leadership and innovation literature by offering an integrated framework and providing practical insights for organizations seeking to strengthen their innovation performance in dynamic and competitive environments.

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