

THE PREDICTIVE POWER OF LEADERSHIP TOWARDS INNOVATIVE BEHAVIOUR: BRIDGING ROLE OF ORGANIZATIONAL CULTURE

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Abstract

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In the present era, leadership and organizational culture contribute significantly to innovative behaviour. The present paper predicts the impact of leadership on innovative behaviour directly and indirectly through organizational culture in Egypt's construction industry, targeting project managers. The researchers followed the domain researchers like Zheng et al. (2019), and Zhao and Sun (2024) to develop the conceptualization of the study. The researchers applied quantitative methods, where the data were collected using a survey questionnaire with a convenience sample technique. Finally, the study derived the results based on 336 valid cases. The results demonstrate a positive effect of transformational and transactional leadership on organizational culture and innovative behaviour. On the other hand, the organizational culture negatively affects innovative behaviour. Finally, the organizational culture mediates the connection between transformational, transactional leadership and innovative behaviour. The findings would navigate and mitigate challenges arising from the connection between organizational culture and innovative behaviour by establishing innovative capabilities platforms that contribute to an inclusive consideration of the intricate interconnections between leadership, organizational culture, and innovation in the construction sector. Finally, the study's findings would enrich the depth of the literature by adding more empirical evidence from a developing context.

Keywords: Transactional Leadership, Transformational Leadership, Organizational Culture, Innovative Behaviour, Construction Industry, Project Managers

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1. INTRODUCTION

In the present time, fostering employees' innovative behaviour has emerged as a critical imperative for organizations seeking survival and sustained success (Zheng et al., 2019). Cultivating innovative thinking among employees can be significantly fortified and elevated through robust leadership strategies, a conducive work environment, and a progressive organizational culture (Al-Shibami et al., 2019). As organizations strive to navigate the complexities of the present era, the ability to instil and nurture a culture of innovation has become a cornerstone for achieving competitive advantage and ensuring long-term viability (de Amorim Cantermi & Lizote, 2023; Zhao & Sun, 2024). Leadership (transformational and transactional) has a robust and meaningful role in enhancing innovative behaviour and organizational performance (Rizki et al., 2019; Lazarević-Moravčević & Ružičić, 2023). Transformational leadership is a leadership style characterized by a focus on giving individual consideration to team members, positive reinforcement of project goals and values to foster team spirit, inspiring others through work passion, asking thought-provoking questions to stimulate team members' thinking, and actively participating alongside the team in the project's construction process (Chen et al., 2012; Li & Shi, 2008). Likewise, a focus on explicit exchanges between the leader and team members characterizes transactional leadership. The leader emphasizes what project members stand to gain by completing tasks, reinforces the connection between goal attainment and rewards, directs attention towards preventing deviations from expectations, and discusses potential special commendations or promotions for exemplary performance. This transactional approach emphasizes a structured and reward-based relationship between the leader and followers (Waldman et al., 2001; Yang & Yang, 2019). With regard to organizational culture refers to the shared values, beliefs, and behaviours within an organization, characterized by a focus on team building, cooperative spirit, promoting employee engagement and sharing, emphasizing both economic and social profits, demonstrating social responsibility in construction projects, encouraging societal development through projects, fostering innovation, accepting change, and boldly adopting new technology (Tsui et al., 2006).

In the literature, several factors such as risk-taking and decision-making, leadership (transformational and transactional), organizational culture, knowledge sharing, innovation climate, work engagement, commitment, compensation, work satisfaction, psychological mechanisms, organizational attractiveness, attitudes are found to be effective predictors of innovative behaviour and organizational performance in the diverse context (Reuvers et al., 2008; Mohammed & Al-Abrow, 2024; Mayastinasari & Suseno, 2023; Zhao, 2024). However, the literature still lacks the empirical investigation in which organizational culture factors, directly and indirectly, predict innovative behaviour in the presence of both transformational and transactional leadership, specifically among project managers of the construction industry in Egypt (Nurlina, 2022; Adriansyah et al., 2020; Avci, 2016; Sürücü & Yeşilada, 2017; Nam Nguyen & Mohamed, 2011; de Amorim Cantermi

& Lizote, 2023). Notwithstanding, the Egyptian construction industry is one of the pillars of economic growth. This is due to the country's large-scale projects and the continuous development of the technology sector (ElSafty et al., 2012; Khamis & Ismail, 2022). A project manager's role in construction is complex. Based on these gaps and importance, we raised the following questions:

RQ1: What is the role of leadership (transformational and transactional) in developing organizational culture and innovative behaviour?

RQ2: How does organizational culture mediate the connection between leadership and innovative behaviour?

By addressing these critical aspects of the association between leadership, organizational culture, and innovation, the study's outcome would help in understanding these dynamics. It can provide valuable insights for leaders and organizations seeking to enhance their innovative capabilities.

The structure of this paper is as follows. Section 2 reviews the relevant literature and develops the hypotheses. Section 3 provides the details of the methods employed in the study. Section 4 offers the data analysis and Section 5 — the discussion. Finally, Section 6 presents the conclusion of the study.

2. LITERATURE REVIEW AND DERIVATION OF HYPOTHESES

Developing innovative behaviour is necessary for every organization to provide psychological safety for producing ideas. Organizational culture and leadership are the supportive constructs of innovative behaviour that encourage risk-taking and decision-making participation. The literature confirms the positive effect of leadership (transformational and transactional) on organizational culture and innovative behaviour (Zheng et al., 2019; ElKordy, 2013; Al-Shibami et al., 2019). Leadership and culture can enhance the behaviour (Zheng et al., 2019). Transformational leaders are regarded as significant cultivators of innovation and organizational culture (Lasrado & Kassem, 2021). According to Al Amin et al. (2023) and Aristarini et al. (2024), transformational leadership and organizational culture positively enhance the innovative behaviours of employees in the organizations. The studies of Mohammed and Al-Abrow (2024) and Amankwaa et al. (2019) suggest the substantial contribution of transformational leadership in developing positive, innovative behaviour. There is a positive connection between transformational leadership, innovation climate, work engagement, knowledge sharing, and innovative behaviour with each other (Reuvers et al., 2008; Mayastinasari & Suseno, 2023; Zhao, 2024).

The role of transactional leadership in organizational culture is positive and significant (Khan et al., 2021). According to Nurlina (2022), work satisfaction, organizational culture, commitment, compensation and transactional leadership positively predict innovation and performance. Avci (2016) suggests the positive influence of transactional leadership styles on organizational culture. The leadership styles, including transactional leadership, have a direct impact on organizational culture, as indicated by Sürücü and Yeşilada (2017).

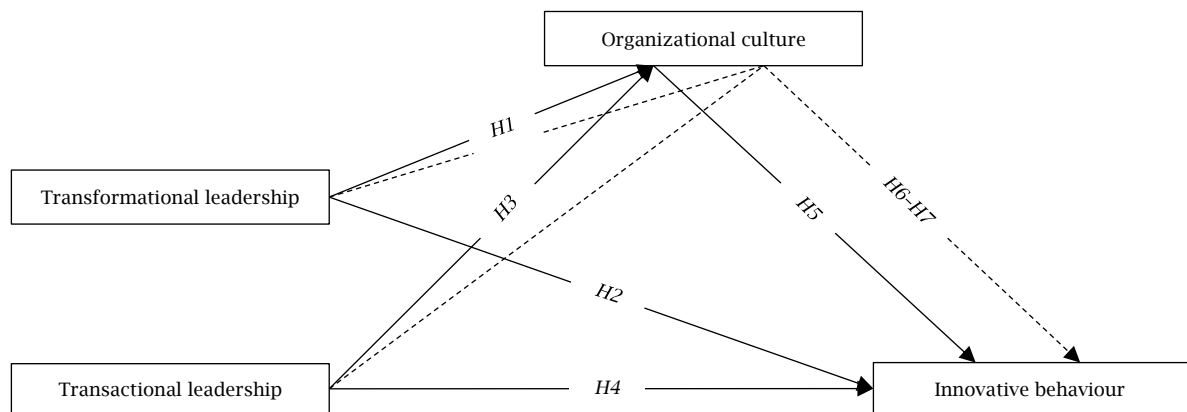
In small and medium enterprises (SMEs), organizational culture is predicted by leadership and transactional styles (de Amorim Cantermi & Lizote, 2023). Work motivation, job satisfaction, workplace learning, and green knowledge management positively affect employees' innovative behaviour (Kim & Lee, 2011; Cai et al., 2024).

The cultural factor also has enormous significance in enhancing innovative behaviour. The studies of Zheng et al. (2019) and Mutonyi et al. (2022) suggest a positive effect of organizational culture on organizational attractiveness and innovative behaviour. The innovative orientation is also reinforced by (Naranjo-Valencia et al., 2011; Li et al., 2018; Lazarević-Moravčević & Ružičić, 2023). According to Rizki et al. (2019), leadership and cultural values forecast employees' innovative behaviour.

The existing literature extensively elucidates the interconnectedness among leadership styles, innovative behaviour and organizational culture within organizational settings. Nevertheless, there are discernible gaps in the current body of knowledge that warrant attention and further

exploration. Specifically, there is a need to investigate the combined impact of leadership on innovative behaviour and organizational culture concurrently. Furthermore, the literature should delve into organizational culture's direct and mediating roles in a more integrated manner. In addressing these gaps, it is crucial to focus on the contextual nuances, particularly within the project management domain in construction sites in Egypt. The examination should focus on project managers, considering their unique role and influence in this context. In light of the identified existing knowledge and contextual gaps, we propose a comprehensive model (refer to Figure 1) to substantiate these relationships among project managers operating in construction sites in Egypt. This model seeks to advance understanding and practice in the field by observing the simultaneous influences of leadership on organizational culture and innovative behaviour, explicitly emphasizing the mediating role of organizational culture.

Figure 1. Model of the study



Source: Authors' elaboration.

2.1. Transformational leadership, organizational culture and innovative behaviour

Transformational leadership predicts organizational culture, as demonstrated by the literature (Zheng et al., 2019; ElKordy, 2013; Al-Shibami et al., 2019). These studies emphasize the pivotal role of transformational leaders in cultivating a positive and innovative organizational culture, contributing to enhanced employee performance, attitudinal outcomes, and overall organizational excellence (Lasrado & Kassem, 2021; Tipu et al., 2012). The scholars like Al Amin et al. (2023) and Aristarini et al. (2024) recognized the mediation role of the work environment in developing the association between transformational leadership and organizational culture.

The literature demonstrates the substantial association between innovative behaviour and transformational leadership across diverse backgrounds. Bednall et al. (2018) emphasize the pivotal contribution of leadership in fostering innovation, while Ismail and Mydin (2019) highlight the influence of transformational leadership and commitment on teachers' innovative behaviour.

Among nurses, there is a positive stimulus of transformational leadership on nurse innovation behaviour (Weng et al., 2013). According to Amankwaa et al. (2019), transformational leadership contributes too positively towards innovative outcomes. In the perception of Reuvers et al. (2008), transformational leadership, work engagement, and innovative behaviour are positively connected. Employees' innovative behaviour. In the same direction, Mohammed and Al-Abrow (2024) recognize the mediating contribution of psychological empowerment in the connection of empowering and transformational leadership on innovative behaviour in the healthcare sector. More recently, scholars like Mayastinasari and Suseno (2023) and Zhao (2024) also recognize the critical role of transformational leadership, innovation climate and knowledge sharing in the development of innovative work behaviour.

Consequently, a substantial body of literature highlights transformational leadership's constructive and positive impact on developing organizational culture and stimulating innovative behaviour across diverse contexts. Nevertheless, when considering the unique dynamics within the project management domain at construction sites in Egypt, there is

a discernible gap in empirical evidence. Therefore, to bridge this gap and contribute to the existing knowledge base, we propose:

H1: Transformational leadership is positively related to organizational culture in construction projects.

H2: Transformational leadership is positively related to innovative behaviour in construction projects.

2.2. Transactional leadership, organizational culture and innovative behaviour

Transactional leadership plays a pivotal contribution in shaping organizational culture. Khan et al. (2021) suggest the positive influence of organizational culture on leadership styles. Similarly, Nurlina (2022) explores the interconnections between performance, commitment, compensation, organizational culture, transactional leadership and work satisfaction. The association between work motivation and performance is mediated by transactional leadership (Adriansyah et al., 2020). According to Avci (2016), the effect of transactional leadership styles of school principals on organizational culture is substantial. In the perception of Sürücü and Yeşilada (2017), leadership styles, including transactional leadership, have a direct impact on organizational culture. The empirical assessment of Nam Nguyen and Mohamed (2011) offers a broader perspective, exploring the substantial connection between leadership behaviours, knowledge management practices and organizational culture. In SMEs, the contribution of leadership, including transactional styles, is robust and substantial in shaping organizational culture (de Amorim Cantermi & Lizote, 2023).

With regard to the association of transactional leadership with innovative behaviour, it was also found to be positive and significant. According to scholars like Sethibe and Steyn (2017), transactional leadership directly influence work behaviour. Renowned scholars like Udin et al. (2022) and Zhao and Sun (2024) demonstrate a direct and mediating role of knowledge sharing and the influence on employees' innovation ability and transactional leadership. The studies by Kim and Lee (2011) and Cai et al. (2024) introduce additional dimensions by investigating the mediating effects of work motivation, job satisfaction, workplace learning, and green knowledge management, illustrating the multifaceted nature of the relationship.

In consequence, the argument is grounded in the established positive effects of transactional leadership on organizational culture and innovation, with the exception noted for construction site managers in Egypt. Hence, we suggest:

H3: Transactional leadership is positively related to organizational culture in construction projects.

H4: Transactional leadership is positively related to innovative behaviour in construction projects.

2.3. Organizational culture and innovative behaviour

The role of organizational culture is positive towards innovative behaviour, as demonstrated by the domain literature. According to Rizki et al. (2019), leadership and cultural values affect employees' innovative behaviour. Hartmann (2006) narrows the focus to the construction industry and

claims the motivating role of organizational culture in driving innovation. Well-known scholars like Sardar and Mahdi (2020) broaden the scope by confirming the positive impact of organizational culture on innovative work behaviour. According to Mutonyi et al. (2022) and Zheng et al. (2019), factors such as leadership climate and organizational culture positively predict innovative behaviour and organizational attractiveness in Norwegian hospital employees. Similarly, the study of Naranjo-Valencia et al. (2011) demonstrates the positive effect of organizational culture on innovative orientation, while Li et al. (2018) highlight the pivotal roles of leadership and organizational culture in raising organizational innovation. Lazarević-Moravčević and Ružičić (2023) consider the effect of organizational structure and culture on the innovative behaviour of the organization.

To sum it up, the literature suggests the positive effect of organizational culture on innovative behaviour. However, in the presence of leadership (transformational and transactional), this relationship is explicitly avoided among project managers of construction sites in Egypt. Hence, we suggest:

H5: Organizational culture is positively related to innovative behaviour in construction projects.

2.4. Mediating contribution of organizational culture

The domain literature comprehensively considers the elaborative association between leadership styles, organizational culture, and innovative behaviour across diverse organizational contexts directly and indirectly. In the healthcare sector, the impact of organizational culture and leadership climate is positive (Mutonyi et al., 2022). In the study of Khan et al. (2020), the exploration offers a positive connection between citizenship behaviour and leadership through organizational culture. Likewise, Li et al. (2018) demonstrate a direct and indirect relationship between leadership, organizational culture and organizational innovation. Innovativeness also mediates in connecting organizational culture, leadership, and performance (Zheng et al., 2019). According to Suifan (2021) and Jung et al. (2021), an organizational learning culture moderates and mediates authentic leadership and leader-member exchange. Kim and Kang's (2015) study claims the effect of professional staff's innovative behaviour and leadership through corporate culture. Recently, Budur et al. (2024) brought in knowledge sharing and quality of work life as mediating factors' positive role in fostering innovative behaviours among academicians.

The existing body of literature consistently establishes a correlation between leadership and innovative behaviour within the framework of organizational culture, considering various constructs and contexts. Nevertheless, the mediating contribution of organizational culture requires further validation, especially in the context of construction sites in Egypt, hence:

H6: Organizational culture mediates the connection between transformational leadership and innovative behaviour in construction projects.

H7: Organizational culture mediates the connection between transactional leadership and innovative behaviour in construction projects.

3. RESEARCH METHODOLOGY

3.1. Approach and respondents

We applied quantitative assessment following the domain researchers like Zheng et al. (2019), Mutonyi et al. (2022), Naranjo-Valencia et al. (2011), Li et al. (2018), Lazarević-Moravčević and Ružičić (2023) and Rizki et al. (2019) who applied the same strategy to explore the leadership, organizational culture and innovative behaviour in several organizations. This highly reputable technique enhances the reliability of facts by providing authentic results with numbers. The study context is Egypt's construction industry, it is the largest and an essential part of the economy of Egypt. This is due to the country's massive infrastructure program and continuous growth in business technology (ElSafty et al., 2012; Khamis & Ismail, 2022). The researchers collected data from project managers who were involved in different projects at construction sites in Egypt. The role of a project manager in construction is meaningful, and it entails an amalgamation of leadership competencies, skills, effective communication and technical knowledge to ensure the successful completion of projects on time, within budget, and of high quality.

3.2. Survey tools and sample size

The researchers used a survey questionnaire as a significant tool for data collection. The questionnaire is considered the most feasible and accessible for researchers and respondents. This provides several choices that offer more comfort and ease to respondents (Slattery et al., 2011). We applied the convenience sample strategy due to its diverse advantages to both modes of data collection, such as online and offline. Still, it limits generalizability as previous researchers may have opted for probability sampling methods such as random or stratified sampling. However, this method is more suitable for researchers as many researchers employed this with great precision and confidence (Lazarević-Moravčević & Ružičić, 2023; Rizki et al., 2019). As a result, we succeed in collecting 342 raw samples. After data cleaning and screening, we utilized 336 valid samples to infer the final results.

3.3. Respondents' ethical protocols

We collect information using personal visits, emails, WhatsApp groups and online surveys. We obtained permission from participants that they wanted to contribute to the research before collecting their responses. The aims and objectives of data

collection were explained to participants in an email, and participants were instructed to return and complete the survey. We followed the participants using ethical protocols. We ensured their privacy and confidentiality in their responses. We ensured they were free to withdraw from the study without mentioning any reason. Finally, we got a signed consent form and handed over the survey questionnaire.

3.4. Measures

We assessed all the items of scale from the literature. More precisely, we assessed transformational leadership (TFL) on five items. These items are adopted from Chen et al. (2012) and Li and Shi (2008). The sample content of scale is "The leader focuses on giving individual consideration to each member of the project". Likewise, we adopted four items from Waldman et al. (2001) and Yang and Yang (2019) to assess transactional leadership (TSL). The taster item is "The leader points out what the project members would receive if they do what needs to be done". We gauged organizational culture (OC) based on nine items of Tsui et al. (2006). The sample content of the scale is "My organization emphasizes team building". Finally, innovative behaviour (IB, dependent variable) is measured on five items, which are adapted from Liu (2011), Hu (2023) and Scott and Bruce (1994). The taster content of the item is "I would generate creative ideas in the work process". Importantly, we measured all the items on a five-point Likert scale (where 1 = strongly agree; 5 = strongly disagree).

4. ANALYSIS AND RESULTS

4.1. Measurement of reliability and validity

To gauge the validity and reliability, the researchers applied the confirmatory factor analysis (CFA). As presented in the findings in Table 1, we measured internal consistency (reliability) through Cronbach's alpha. The alpha scores range from 0.789 to 0.862, above the threshold of 0.7, as Bryant et al. (1999) recommended. Moreover, the factor loadings scores are found to range from 0.777 (IB5) to 0.877 (TFL1), which are also within fair ranges (Hair et al., 2020), except the items OC3 and OC6 (deleted due to low loading of < 0.70). Likewise, the average variance extracted (AVE) is found to be from 0.662 (OC) to 0.702 (TFL), which is above the threshold value (0.50) (Hair et al., 2020). In the last, the composite reliability (CR) scores were found to be 0.891 (TSL) to 0.932 (OC), which are also above the threshold value (0.70) (Hair et al., 2020).

Table 1. Confirmatory factor analysis for the measurement model (Part 1)

Construct	Item code	Loadings scores	CR	AVE	α
Transformational leadership	TFL1	0.877	0.922	0.702	0.862
	TFL2	0.866			
	TFL3	0.827			
	TFL4	0.818			
	TFL5	0.799			
Transactional leadership	TSL1	0.847	0.891	0.671	0.822
	TSL2	0.821			
	TSL3	0.807			
	TSL4	0.800			

Table 1. Confirmatory factor analysis for the measurement model (Part 2)

Construct	Item code	Loadings scores	CR	AVE	α
Organizational culture	OC1	0.876	0.932	0.662	0.789
	OC2	0.851			
	OC4	0.832			
	OC5	0.817			
	OC7	0.787			
	OC8	0.768			
	OC9	0.755			
Innovative behaviour	IB1	0.862	0.909	0.668	0.819
	IB2	0.838			
	IB3	0.807			
	IB4	0.799			
	IB5	0.777			

Note: Deleted items: OC3, OC6. CR – composite reliability.

Source: Authors' elaboration.

In the second stage, we confirmed the discriminant validity (DV) and compared the squared correlations of the factors for the variance extracted. Table 2

demonstrates the squared correlations and suggests adequate DV (Hair et al., 2020). Hence, the measurement model and DV ensured the ideal values.

Table 2. Discriminant validity

Constructs	Innovative behaviour (IB)	Transformational leadership (TFL)	Transactional leadership (TSL)	Organizational culture (OC)
Innovative behaviour (IB)				
Transformational leadership (TFL)	0.078			
Transactional leadership (TSL)	0.139	0.059		
Organizational culture (OC)	0.131	0.137	0.088	

Note: Diagonals represent the AVE while the other entries represent the squared correlations.

Source: Authors' elaboration.

4.2. Structural model

We applied structural equation modelling (SEM), which is regarded as a strong and powerful multivariate analysis technique (González et al., 2008). This is a frequent practice used by social, management and business researchers as it is favourable in dealing with complex analyses of measurement (Hershberger, 2003). Moreover, SEM offers a flexible framework for evolving and examining multifaceted associations among multiple variables, allowing researchers to test the theory's validity using empirical models. In this way, the researchers applied the maximum likelihood

estimate (MLE) through AMOS software version 27.0 to ensure the structural paths (Lo & Ramayah, 2011). As presented in Figure 2 and Table 3, the direct path suggests a significant effect of transformational leadership on organizational culture and innovative behaviour ($H1 = \beta = 0.570$; $p < 0.01$; $H2 = \beta = 0.352$; $p < 0.01$), which accepted the $H1$ and $H2$. Likewise, transactional leadership positively affects organizational culture and innovative behaviour ($H3 = \beta = 0.318$; $p < 0.01$; $H4 = \beta = 0.326$; $p < 0.01$). As a result, $H3$ and $H4$ were also accepted. On the other hand, the impact of organizational culture on innovative behaviour is negative ($H5 = \beta = -0.023$; $p > 0.01$). Hence, $H5$ is not supported.

Table 3. Structural equation modelling estimations (direct path)

No.	Effects	Estimate	SE	CR	p	Decision
H1	Transformational leadership (TFL) → Organizational culture (OC)	0.570	0.053	10.789	0.000	Supported
H2	Transformational leadership (TFL) → Innovative behaviour (IB)	0.352	0.041	8.629	0.000	Supported
H3	Transactional leadership (TSL) → Organizational culture (OC)	0.318	0.059	5.347	0.000	Supported
H4	Transactional leadership (TSL) → Innovative behaviour (IB)	0.326	0.068	4.798	0.000	Supported
H5	Organizational culture (OC) → Innovative behaviour (IB)	-0.023	0.05	0.459	0.646	Not supported

Note: SE – standard error, CR – critical ratio, p – significance level. *** $p < 0.05$.

Source: Authors' elaboration.

With regard to mediating effects, the analysis exerts a positive mediating impact on organizational culture in developing an association between transformational leadership and innovative behaviour and transactional leadership and innovative

behaviour ($H6 = \beta = 0.112$; $p < 0.01$; $H7 = \beta = 0.115$; $p < 0.01$) (Table 4 and Figure 2). Henceforth, $H6$ - $H7$ are also supported.

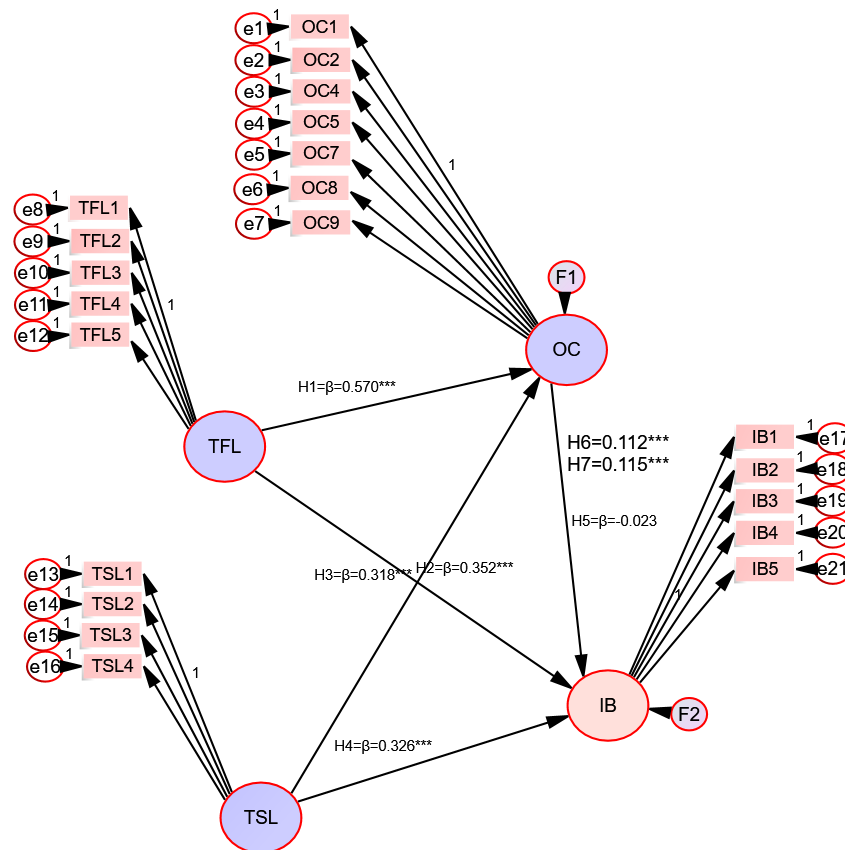
Table 4. Structural equation modelling estimations (indirect path)

No.	Effects	Estimate	SE	CR	p	Decision
H6	Transformational leadership (TFL) → Organizational culture (OC) → Innovative behaviour (IB)	0.112	0.026	4.332	0.000	Supported
H7	Transactional leadership (TSL) → Organizational culture (OC) → Innovative behaviour (IB)	0.115	0.029	4.014	0.000	Supported

Note: SE – standard error, CR – critical ratio, p – significance level. *** $p < 0.05$.

Source: Authors' elaboration.

Figure 2. Structural equation modelling estimates



Note: $*** p < 0.01$.

Source: Authors' elaboration.

5. DISCUSSION

The study proposed the exploration of innovative behaviour through the leadership and organizational culture of Egyptian project managers at construction sites. The study confirmed the positive impact of transformational leadership on innovative behaviour and organizational culture. These findings are in line with prior studies (Zheng et al., 2019; Al-Shibami et al., 2019; Lasrado & Kassem, 2021; Tipu et al., 2012; Al Amin et al., 2023; Aristarini et al., 2024; Mohammed & Al-Abrow, 2024), who claimed the same results. These results suggest that transformational leadership positively impacts organizational culture and innovative behaviour. By focusing on individual consideration, leaders cultivate a sense of belonging and commitment among team members, raising a personalized and substantial organizational culture. Emphasizing project goals and values contributes to a shared team attitude, aligning individual efforts with collective objectives and promoting a collaborative culture. Inspiring work passion energizes the organizational environment, motivating employees to engage in innovative activities. Leaders who pose stimulating questions encourage critical thinking and open communication, shaping a culture that values creative problem-solving. Actively participating in the construction process and sharing work responsibilities strengthens teamwork and unity, enhancing the exchange of ideas among project members. Moreover, when an organization emphasizes team building, cooperative spirit, and

social responsibility, it further supports a positive culture that encourages employees to explore new ideas and actively contribute to innovation. This, in turn, translates into a proactive attitude toward generating and implementing creative ideas, reinforcing the organization's overall capacity for innovation.

Moreover, the study confirmed the positive impact of transactional leadership on organizational culture and innovative behaviour. These results are accorded with the domain literature (Adriansyah et al., 2020; Avci, 2016; Nam Nguyen & Mohamed, 2011; de Amorim Cantermi & Lizote, 2023; Udin et al., 2022; Zhao & Sun, 2024; Cai et al., 2024). The results may reflect that transactional leaders instil clarity by providing clear expectations and guidelines, which is essential in the precision-demanding construction industry. The use of a reward system by transactional leaders motivates project managers to meet deadlines and maintain quality work, fostering a culture of achievement. Furthermore, the risk-mitigating focus of transactional leadership aligns well with the unpredictable nature of construction projects, contributing to a stable organizational culture. Emphasizing compliance with industry standards promotes a sense of responsibility and professionalism. While transactional leadership traditionally prioritizes task-oriented approaches, its structured environment allows for innovation within established parameters. Moreover, the regular performance monitoring and feedback characteristic of transactional leaders contributes to continuous improvement and professional

development, enhancing the positive impact on organizational culture and innovative behaviour among project managers in Egyptian construction settings.

On the other hand, the results demonstrate a negative impact of organizational culture on innovative behaviour. These outcomes contradict the field literature (Sardar & Mahdi, 2020; Zheng et al., 2019; Mutonyi et al., 2022; Naranjo-Valencia et al., 2011). The negative impact of organizational culture on innovative behaviour among project managers in Egyptian construction sites could be attributed to a confluence of factors. A hierarchical and bureaucratic organizational structure may impede the agility needed for creative problem-solving. Moreover, a risk-averse culture prevalent in the construction industry may encourage managers to explore innovative solutions, given the sector's inherent safety and financial stability concerns. A lack of explicit support for innovation within the organizational culture, coupled with insufficient human and financial resources, may hinder the development and implementation of novel ideas. Communication barriers and a traditional mindset that values the preservation of established practices could also contribute to the observed negativity. Besides, external factors like regulatory constraints and market conditions may further limit the scope for innovation. Ultimately, a nuanced understanding of these interconnected elements is crucial for comprehending the intricate dynamics between organizational culture and innovation among project managers in Egyptian construction contexts.

Finally, the organizational culture mediates the connection between leadership (transformational and transactional) and innovative behaviour and is supported by the literature (Mutonyi et al., 2022; Khan et al., 2020; Li et al., 2018; Zheng et al., 2019; Suifan, 2021; Jung et al., 2021). This can be attributed to several factors. Through their inspirational vision and intellectual stimulation, transformational leaders foster an environment that encourages creative thinking and risk-taking, contributing to innovative practices. Transactional leaders, focusing on clear expectations and rewards, may motivate project managers to seek innovative solutions to meet performance goals. The mediating role of organizational culture implies that a positive and innovative culture, characterized by shared values, open communication, and collaboration, amplifies the impact of leadership styles on individual behaviour. Contextual factors, including the cultural and industry-specific dynamics of Egypt's construction environment, significantly influence how leadership styles are perceived and how they translate into innovative outcomes. In addition, individual and team characteristics and the quality of measurement tools and research methodology contribute to the nuanced understanding of how leadership, organizational culture, and innovation intersect in the context of construction project management in Egypt.

6. CONCLUSION

The overall findings of this research underscore the positive impact of leadership (transformational and transactional) on fostering organizational culture and encouraging innovative behaviour

among project managers within construction sites in Egypt. Interestingly, the research also reveals a nuanced aspect of the interplay between organizational culture and innovative behaviour, indicating a negative correlation. Notably, organizational culture emerges as a crucial mediator, elucidating its pivotal role in shaping the connection between leadership and the innovative behaviours exhibited by project managers. These insights contribute to a comprehensive understanding of the dynamics influencing organizational success within the construction sector, emphasizing the intricate interconnections between leadership, organizational culture, and innovation.

With regard to practical implications, pursuing the results of the study, organizational success within the construction sector in Egypt can cultivate transformational and transactional leadership skills among project managers, ensuring strategic alignment with the desired organizational culture. Recognizing organizational culture as a crucial mediator, initiatives should be implemented to shape and reinforce a positive and innovation-friendly environment intentionally. Performance metrics and recognition systems need adaptation to appreciate and reward innovative behaviours, fostering motivation among project managers. Emphasizing effective communication and collaboration within leadership styles is essential to bridge potential gaps. Continuous monitoring, feedback mechanisms, and adaptability in leadership approaches are critical for addressing evolving organizational needs. Besides, training programs should be established to navigate and mitigate challenges arising from the nuanced negative correlation between organizational culture and innovative behaviour. Establishing knowledge-sharing platforms further enhances the innovative capabilities of project managers, contributing to meaningful knowledge of the connections between leadership, organizational culture, and innovation in the construction sector in Egypt.

The theoretical implications of the study's findings contribute valuable insights to the existing knowledge in organizational behaviour, leadership, and innovation within the context of the construction sector in Egypt. Firstly, the research underscores the relevance of integrating transformational and transactional leadership styles in understanding their combined impact on organizational culture and innovative behaviour. This enriches leadership theory by emphasizing leaders' multifaceted role in shaping the work environment and fostering innovation. Secondly, identifying organizational culture as a crucial mediator highlights the intricate dynamics between leadership styles and innovative behaviour. This insight advances organizational culture theory, providing a nuanced understanding of how cultural elements mediate the association between leadership and innovation. The study's revelation of a negative association between organizational culture and innovation adds complexity to the theoretical discourse, prompting further exploration into the contextual factors influencing this relationship. Overall, these theoretical implications contribute to the interdependencies between leadership, organizational culture, and innovation in the unique context of construction projects in Egypt,

offering a foundation for future research and theoretical development in organizational studies.

The study is limited to a few constructs, i.e., innovative behaviour, leadership (transformational and transactional) and organizational culture. The context of the study is based on the Egyptian construction industry, where we targeted the project managers. The study is restricted to a convenience sampling strategy; this may create an issue of the generalization of the results. The conclusion is based on a total of 336 samples. Finally, the study did not apply the theory to support the study's framework.

Future research in the field could explore the limitations identified in the study to enrich our understanding of leadership, organizational culture, and innovative behaviour within the Egyptian construction industry. One avenue for improvement involves expanding the scope of constructs considered, incorporating elements such as organizational structure and communication patterns. Additionally, researchers may benefit from diversifying

the industry contexts studied or comparing findings across different countries to enhance external validity. A more nuanced analysis of leadership styles, focusing on specific behaviours within the transformational and transactional frameworks, could deepen insights. To address concerns about generalizability, adopting a more representative sampling strategy, possibly through random or stratified sampling, would strengthen the study's applicability. Increasing the sample size would improve statistical power while integrating established theoretical frameworks could provide a more solid foundation for the study. Longitudinal research designs may uncover the dynamic nature of relationships over time, and combining quantitative data with qualitative insights through a mixed-methods approach could offer a more comprehensive understanding. Cross-cultural comparisons and intervention studies could further contribute to refining strategies for fostering innovative behaviour in the Egyptian construction industry.

REFERENCES

- Adriansyah, M. A., Setiawan, M., & Yuniarinto, A. (2020). The influence of transactional leadership style and work culture on work performance mediated by work motivation. *Jurnal Aplikasi Manajemen*, 18(3), 563–571. <https://doi.org/10.21776/ub.jam.2020.018.03.17>
- Al Amin, R., Prahawan, W., Ramdanyah, A. D., & Haryadi, D. (2023). Employee performance under organizational culture and transformational leadership: A mediated model. *Jurnal Mantik*, 7(2), 719–728. <https://iocscience.org/ejournal/index.php/mantik/article/view/3879>
- Al-Shibami, A. H., Alateibi, N., Nusari, M., Ameen, A., Khalifa, G. S. A., & Bhaumik, A. (2019). Impact of organizational culture on transformational leadership and organizational performance. *International Journal of Recent Technology and Engineering*, 8(2), 653–664. <https://doi.org/10.35940/ijrte.B1116.0982S1019>
- Amankwaa, A., Gyensare, M. A., & Susomrith, P. (2019). Transformational leadership with innovative behaviour: Examining multiple mediating paths with PLS-SEM. *Leadership & Organization Development Journal*, 40(4), 402–420. <https://doi.org/10.1108/LODJ-10-2018-0358>
- Aristarini, C. C., Riyadi, S., & Halik, A. (2024). The effect of transformational leadership and organizational culture on employee performance with work environment as mediation variable (Study at PT Japura Inti Pangan). *International Journal of Economics*, 3(1), 98–108. <https://ejournal.ipinternasional.com/index.php/ijec/article/view/574>
- Avci, A. (2016). Okul müdürlerinin dönüştürücü ve işlemci liderlik stillerinin örgüt kültürüne etkisi [Effect of transformational and transactional leadership styles of school principals on organizational culture]. *International Journal of Human Sciences*, 13(3), 4780–4807. <https://www.j-humansciences.com/ojs/index.php/IJHS/article/view/4160>
- Bednall, T. C., Rafferty, A. E., Shipton, H., Sanders, K., & Jackson, C. J. (2018). Innovative behaviour: How much transformational leadership do you need? *British Journal of Management*, 29(4), 796–816. <https://doi.org/10.1111/1467-8551.12275>
- Bryant, F. B., Yarnold, P. R., & Michelson, E. A. (1999). Statistical methodology: VIII. Using confirmatory factor analysis (CFA) in emergency medicine research. *Academic Emergency Medicine*, 6(1), 54–66. <https://doi.org/10.1111/j.1553-2712.1999.tb00096.x>
- Budur, T., Demirer, H., & Rashid, C. A. (2024). The effects of knowledge sharing on innovative behaviours of academicians; mediating effect of innovative organization culture and quality of work life. *Journal of Applied Research in Higher Education*, 16(2), 405–426. <https://doi.org/10.1108/JARHE-08-2022-0257>
- Cai, X., Khan, N. A., & Egorova, O. (2024). Transactional leadership matters in green creative behaviour through workplace learning and green knowledge management: Moderating role of social network sites use. *Personnel Review*, 53(2), 317–335. <https://doi.org/10.1108/PR-12-2020-0894>
- Chen, X., Wang, S., & Yang, L. (2012). The impact mechanism of transformational leadership on firm performance: Based on a survey of SMEs' leaders. *Science of Science and Management of S&T*, 11, 160–171. http://caod.oriprobe.com/articles/31109412/The_Impact_Mechanism_of_Transformational_Leadership_on_Firm_Performanc.htm
- de Amorim Cantermi, B., & Lizote, S. A. (2022). Leadership and organizational culture in small companies. *Revista de Administração da UFSM*, 15(4), 634–656. <https://doi.org/10.5902/1983465970384>
- ElKordy, M. (2013). Transformational leadership and organizational culture as predictors of employees attitudinal outcomes. *Business Management Dynamics*, 3(5), 15–26. https://www.academia.edu/70760771/Transformational_Leadership_and_Organizational_Culture_as_Predictors_of_Employees_Attitudinal_Outcomes
- ElSafty, A., ElSafty, A., & Malek, M. (2012). Construction safety and occupational health education in Egypt, the EU, and US firms. *Open Journal of Civil Engineering*, 2(3), 174–182. <http://doi.org/10.4236/ojce.2012.23023>
- González, J., De Boeck, P., & Tuerlinckx, F. (2008). A double-structure structural equation model for three-mode data. *Psychological Methods*, 13(4), 337–353. <https://doi.org/10.1037/a0013269>

- Hair, J. F., Jr., Howard, M. C., & Nitzl, C. (2020). Assessing measurement model quality in PLS-SEM using confirmatory composite analysis. *Journal of Business Research*, 109, 101-110. <https://doi.org/10.1016/j.jbusres.2019.11.069>
- Hartmann, A. (2006). The role of organizational culture in motivating innovative behaviour in construction firms. *Construction Innovation*, 6(3), 159-172. <https://doi.org/10.1108/14714170610710712>
- Hershberger, S. L. (2003). The growth of structural equation modeling: 1994-2001. *Structural Equation Modeling*, 10(1), 35-46. https://doi.org/10.1207/S15328007SEM1001_2
- Hu, C. (2023). Study on the relationship between innovation self-efficacy and innovation behavior. *Academic Journal of Management and Social Sciences*, 2(1), 89-93. <https://www.researchgate.net/publication/370217947>
- Ismail, A., & Mydin, A. A. (2019). The impact of transformational leadership and commitment on teachers' innovative behaviour. In *Proceedings of the 4th ASEAN Conference on Psychology, Counselling, and Humanities (ACPCH 2018)* (pp. 426-430). Atlantis Press. <https://doi.org/10.2991/acpch-18.2019.100>
- Jung, K. B., Ullah, S. M. E., & Choi, S. B. (2021). The mediated moderating role of organizational learning culture in the relationships among authentic leadership, leader-member exchange, and employees' innovative behavior. *Sustainability*, 13(19), Article 10802. <https://doi.org/10.3390/su131910802>
- Khamis, N. I., & Ismail, W. K. W. (2022). The impact of corporate social responsibility on corporate image in the construction industry: A case of SMEs in Egypt. *Journal of Sustainable Finance & Investment*, 12(1), 128-146. <https://doi.org/10.1080/20430795.2021.1930992>
- Khan, I. U., Khan, M. S., & Idris, M. (2021). Investigating the support of organizational culture for leadership styles (transformational & transactional). *Journal of Human Behavior in the Social Environment*, 31(6), 689-700. <https://doi.org/10.1080/10911359.2020.1803174>
- Khan, M. A., Ismail, F. B., Hussain, A., & Alghazali, B. (2020). The interplay of leadership styles, innovative work behavior, organizational culture, and organizational citizenship behavior. *Sage Open*, 10(1). <https://doi.org/10.1177/2158244019898264>
- Kim, H. S., & Kang, K. H. (2015). Influence of types of leadership and organizational culture on innovative behavior of professional staff of a general hospital. *Journal of Korean Academy of Nursing Administration*, 21(4), 447-456. <https://doi.org/10.1111/jkana.2015.21.4.447>
- Kim, J.-G., & Lee, S.-Y. (2011). Effects of transformational and transactional leadership on employees' creative behaviour: Mediating effects of work motivation and job satisfaction. *Asian Journal of Technology Innovation*, 19(2), 233-247. <https://doi.org/10.1080/19761597.2011.632590>
- Lasrado, F., & Kassem, R. (2021). Let's get everyone involved! The effects of transformational leadership and organizational culture on organizational excellence. *International Journal of Quality & Reliability Management*, 38(1), 169-194. <https://doi.org/10.1108/IJQRM-11-2019-0349>
- Lazarević-Moravčević, M., & Ružičić, M. M. (2023). Organizational structure and organizational culture — Impact on innovative behavior of the organization. *Economic Analysis*, 56(2), 39-53. <https://doi.org/10.28934/ea.23.56.2.pp39-53>
- Li, C., & Shi, K. (2008). The structure and measurement of transformational leadership in China. *Frontiers of Business Research in China*, 2, 571-590. <https://doi.org/10.1007/s11782-008-0032-5>
- Li, W., Bhutto, T. A., Nasiri, A. R., Shaikh, H. A., & Samo, F. A. (2018). Organizational innovation: The role of leadership and organizational culture. *International Journal of Public Leadership*, 14(1), 33-47. <https://doi.org/10.1108/IJPL-06-2017-0026>
- Liu, Y. (2011). An empirical study on the relationship between self-leadership and employee innovative behavior: The mediating effect of psychological empowerment. *Studies in Science of Science*, 10, 1584-1593. http://caod.oriprobe.com/articles/29548578/An_empirical_study_on_the_relationship_between_self_leadership_and_em.htm
- Lo, M. C., & Ramayah, T. (2011). Mentoring and job satisfaction in Malaysian SMEs. *Journal of Management Development*, 30(4), 427-440. <https://doi.org/10.1108/02621711111126891>
- Mayastinasari, V., & Suseno, B. (2023). The role of transformational leadership, and knowledge sharing on innovative work behavior of public organization in the digital era. *International Journal of Professional Business Review*, 8(7), Article e02977. <https://doi.org/10.26668/businessreview/2023.v8i7.2977>
- Mohammed, A. A., & Al-Abrow, H. (2024). The impact of empowering and transformational leadership on innovative behaviour: The mediating role of psychological empowerment in health-care sector. *Leadership in Health Services*, 37(2), 231-246. <https://doi.org/10.1108/LHS-05-2023-0036>
- Mutonyi, B. R., Slåtten, T., Lien, G., & González-Piñero, M. (2022). The impact of organizational culture and leadership climate on organizational attractiveness and innovative behavior: A study of Norwegian hospital employees. *BMC Health Services Research*, 22, Article 637. <https://doi.org/10.1186/s12913-022-08042-x>
- Nam Nguyen, H., & Mohamed, S. (2011). Leadership behaviors, organizational culture and knowledge management practices: An empirical investigation. *Journal of Management Development*, 30(2), 206-221. <https://doi.org/10.1108/026217111111105786>
- Naranjo-Valencia, J. C., Jiménez-Jiménez, D., & Sanz-Valle, R. (2011). Organizational culture effect on innovative orientation. *Management Decision*, 49(1), 55-72. <https://doi.org/10.1108/00251741111094437>
- Nurlina, N. (2022). Examining linkage between transactional leadership, organizational culture, commitment and compensation on work satisfaction and performance. *Golden Ratio of Human Resource Management*, 2(2), 108-122. <https://doi.org/10.52970/grhrm.v2i2.182>
- Reuvers, M., Van Engen, M. L., Vinkenburg, C. J., & Wilson-Evered, E. (2008). Transformational leadership and innovative work behaviour: Exploring the relevance of gender differences. *Creativity and Innovation Management*, 17(3), 227-244. <https://doi.org/10.1111/j.1467-8691.2008.00487.x>
- Rizki, M., Parashakti, R. D., & Saragih, L. (2019). The effect of transformational leadership and organizational culture towards employees' innovative behaviour and performance. *International Journal of Economics and Business Administration*, 7(1), 227-239. <https://doi.org/10.35808/ijeba/208>
- Sardar, M., & Mahdi, T. (2020). Impact of organizational culture on innovative work behavior. *Black Sea Journal of Management and Marketing*, 1(2), 11-20. <https://scholar.archive.org/work/74gea4qxtjfn70kqnj6yd712dm/access/wayback/https://www.bsimm.com/index.php/bsimm/article/download/57/13>

- Scott, S. G., & Bruce, R. A. (1994). Determinants of innovative behavior: A path model of individual innovation in the workplace. *Academy of Management Journal*, 37(3), 580-607. <https://www.jstor.org/stable/256701>
- Sethibe, T., & Steyn, R. (2017). The impact of leadership styles and the components of leadership styles on innovative behaviour. *International Journal of Innovation Management*, 21(2), Article 1750015. <https://doi.org/10.1142/S1363919617500153>
- Slattery, E. L., Voelker, C. C. J., Nussenbaum, B., Rich, J. T., Paniello, R. C., & Neely, J. G. (2011). A practical guide to surveys and questionnaires. *Otolaryngology — Head and Neck Surgery*, 144(6), 831-837. <https://doi.org/10.1177/0194599811399724>
- Suifan, T. (2021). How innovativeness mediates the effects of organizational culture and leadership on performance. *International Journal of Innovation Management*, 25(2), Article 2150016. <https://doi.org/10.1142/S136391962150016X>
- Sürücü, L., & Yeşilada, T. (2017). The impact of leadership styles on organizational culture. *International Journal of Business and Management Invention*, 6(8), 31-39. <https://www.researchgate.net/publication/319135951>
- Tipu, S. A. A., Ryan, J. C., & Fantazy, K. A. (2012). Transformational leadership in Pakistan: An examination of the relationship of transformational leadership to organizational culture and innovation propensity. *Journal of Management & Organization*, 18(4), 461-480. <https://doi.org/10.5172/jmo.2012.18.4.461>
- Tsui, A. S., Wang, H., & Xin, K. R. (2006). Organizational culture in China: An analysis of culture dimensions and culture types. *Management and Organization Review*, 2(3), 345-376. <https://doi.org/10.1111/j.1740-8784.2006.00050.x>
- Udin, U., Dananjoyo, R., & Isalman, I. (2022). Transactional leadership and innovative work behavior: Testing the mediation role of knowledge sharing in distribution market. *Journal of Distribution Science*, 20(1), 41-53. <https://doi.org/10.15722/jds.20.01.202201.41>
- Waldman, D. A., Ramirez, G. G., House, R. J., & Puranam, P. (2001). Does leadership matter? CEO leadership attributes and profitability under conditions of perceived environmental uncertainty. *Academy of Management Journal*, 44(1), 134-143. <https://www.jstor.org/stable/3069341>
- Weng, R.-H., Huang, C.-Y., Chen, L.-M., & Chang, L.-Y. (2013). Exploring the impact of transformational leadership on nurse innovation behaviour: A cross-sectional study. *Journal of Nursing Management*, 23(4), 427-439. <https://doi.org/10.1111/jonm.12149>
- Yang, H., & Yang, J. (2019). The effects of transformational leadership, competitive intensity and technological innovation on performance. *Technology Analysis & Strategic Management*, 31(3), 292-305. <https://doi.org/10.1080/09537325.2018.1498475>
- Zhao, W., & Sun, X. M. (2024). The influence of transactional leadership style on employees' innovation ability. *Nurture*, 18(1), 139-160. <https://doi.org/10.55951/nurture.v18i1.550>
- Zhao, X. (2024). Study on the impact mechanism of transformational leadership on employee innovative behavior. *International Journal of Interdisciplinary Studies in Social Science*, 1(1), 12-20. <https://doi.org/10.62309/7p8rme49>
- Zheng, J., Wu, G., Xie, H., & Li, H. (2019). Leadership, organizational culture, and innovative behavior in construction projects: The perspective of behavior-value congruence. *International Journal of Managing Projects in Business*, 12(4), 888-918. <https://doi.org/10.1108/IJMPB-04-2018-0068>