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Sereyath Em,  
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REVIEWED BY  
Rany Sam,  
National University of Battambang,  
Cambodia  
Sovanna Huot,  
University of Delhi, India

**\*CORRESPONDENCE**

Said Rashid Ali Alshuhumi  
✉ saidphdm@gmail.com

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# Transformational leadership, innovation-oriented organizational culture, and organizational commitment among primary school teachers in Oman: a PLS-SEM analysis

Said Rashid Ali Alshuhumi\*,  
Dawood Abdul Malek Yahya Al-Hidabi and  
Akinbode Ismaila Akinbode

Kulliyah of Education, International Islamic University Malaysia, Kuala Lumpur, Malaysia

This study investigates the relationship between transformational leadership (TL) and organizational commitment (OC) among primary school teachers in Oman, with innovation-oriented organizational culture (IOC) examined as both a direct predictor and a moderating variable. Drawing on transformational leadership theory and social exchange theory, the study proposes a structural model tested using Partial Least Squares Structural Equation Modeling (PLS-SEM) with data collected from 368 teachers. The results reveal a complex relationship between leadership, culture, and commitment. Transformational leadership demonstrates a significant positive effect on innovation-oriented organizational culture, indicating its role in shaping supportive and innovative school environments. However, contrary to theoretical expectations, transformational leadership exhibits a negative direct effect on organizational commitment, suggesting that leadership behaviors do not directly translate into increased teacher commitment within this context. In contrast, innovation-oriented organizational culture emerges as the strongest predictor of organizational commitment, highlighting the central role of organizational environment in shaping teachers' psychological attachment to their schools. Furthermore, the moderating effect of innovation-oriented organizational culture on the relationship between transformational leadership and organizational commitment is not supported, indicating that leadership and culture function as independent rather than interactive predictors in this setting. Overall, the findings support a culture-dominant explanatory model of organizational commitment, where transformational leadership influences commitment indirectly through cultural development rather than direct attitudinal pathways. These results contribute to leadership and organizational behavior literature by challenging the universality of transformational leadership effects and emphasizing the critical role of organizational culture in shaping employee commitment in centralized educational systems.

**KEYWORDS**

educational leadership, innovation-oriented culture, Oman, organizational commitment, PLS-SEM, transformational leadership

## 1 Introduction

Educational systems across the globe face unprecedented pressure from multiple stakeholders—governments, employers, parents, and even students—to deliver high-quality learning outcomes (Akinbode and Alshuhumi et al., 2025; OECD, 2019). At the same time, these systems must respond to rapid societal, technological, and economic changes (World Bank, 2020). In the Sultanate of Oman, the national strategy with a focus on achieving Vision 2040 emphasizes innovation, technology development, teacher engagement, and the transformation of educational institutions (Al-Harathi, 2022; Khalid Salim and Abdul Wahab, 2024). Considering this evolving context, leadership at the school level—particularly in primary schools, which form the foundational structure underpinning the entire education system—must move beyond operational oversight. School leadership must act as a catalyst for pedagogical innovation, transformation, and teacher commitment, providing a base for sustainable organizational effectiveness. Schools bereft of such leadership risk stagnation, retrogression, teacher burnout, and suboptimal student outcomes (Alshuhumi et al., 2025).

Transformational leadership (TL), one of the most effective leadership practices, is characterized by behaviors such as articulating an inspiring vision, intellectual stimulation, individualized consideration, and modeling ethical conduct (Bass, 1985; Bass and Riggio, 2006; Leithwood and Jantzi, 2005). Transformational leadership has been extensively studied as a key driver of employee motivation and organizational performance (Bass, 1985, 1997; Bass and Avolio, 1994; Bass and Riggio, 2006). The foundational concept of transformational leadership originates from Burns' seminal work, which emphasizes leaders' role in inspiring and transforming followers (Burns, 1978). Transformational leadership theory provides a robust framework for examining leader behaviors in diverse organizational contexts (Northouse, 2007).

Prior research links TL to positive organizational outcomes and higher employee commitment across educational settings (Gyensare et al., 2016; Kareem et al., 2023; Khalid Salim and Abdul Wahab, 2024; Promchart and Potipiroon, 2020). Empirical evidence from Oman shows that TL practices are well-established within the Ministry of Education and positively associated with teacher engagement and loyalty. However, Omani contextual factors such as hierarchical structures, centralized decision-making, and collectivist norms influence how leadership behaviors are perceived and internalized by teachers (Al-Harathi, 2022). This indicates that leadership alone may not suffice to drive organizational commitment.

Organizational culture is no longer considered a passive background factor in any organization, including school systems. Innovation-oriented culture (IOC)—defined as shared assumptions, values, and practices that encourage experimentation, low bureaucracy, risk-taking, and continuous improvement—is a critical factor that can serve as a lever or constraint to leadership effectiveness (Al-Sada et al., 2017; Bass and Avolio, 1994; Lasrado and Kassem, 2021; Zuraik and Kelly, 2019). Khalid Salim and Abdul Wahab (2024) found that, despite the presence of transformational leadership, the absence of a robust innovative culture limited performance outcomes in

Omani institutions. This suggests that the school's cultural environment and the innovation culture exhibited by teachers set boundary conditions for leadership impact (Amurao, 2024; Schein, 2010).

Despite these insights, significant gaps remain in the literature on Omani primary schools. Most studies focus on direct effects (TL → OC) and treat culture as static or secondary (Gyensare et al., 2016). Only a few studies examine how innovation-oriented culture strengthens the effect of transformational leadership on teacher commitment, particularly in primary schools, where early-stage teacher socialization, workload pressures, and rigid curricula pose unique challenges (Alshuhumi et al., 2025; Jung, Chow and Wu, 2008). The study by Alshuhumi et al. (2025) highlighted conceptual ambiguity regarding culture's role, emphasizing the need for explicit conceptualization and corresponding statistical treatment.

Grounded in transformational leadership theory and contingency/interactionist models of organizational behavior (Bass, 1985; Bass and Avolio, 1994; Northouse, 2007), this study posits that transformational leadership fosters teacher commitment, but the strength of this effect depends on the school's culture supporting innovation. Gender is included as a control variable to account for potential differences in how male and female teachers perceive leadership and cultural support, reflecting Oman's gender-segregated schooling system (Al-Harathi, 2022; Eagly and Heilman, 2016; Kareem et al., 2023).

This study makes three key contributions. First, by reaffirming the TL–OC relationship in Omani primary schools, it addresses an empirical gap in non-Western educational contexts (Kareem et al., 2023; Khalid Salim and Abdul Wahab, 2024). Second, it clarifies the moderating role of innovation-oriented culture, resolving prior conceptual ambiguity (Alshuhumi et al., 2025; Zuraik and Kelly, 2019). Third, by focusing on primary schools, it illuminates how context-specific factors—hierarchical norms, teacher retention challenges, and curricular pressures—shape the interplay of leadership, culture, and commitment (Al-Harathi, 2022).

While prior research using the same dataset examined the mediating role of innovation-oriented culture in the relationship between transformational leadership and organisational commitment, the present study adopts a different analytical perspective by examining moderation effects. Specifically, this study investigates whether innovation-oriented culture functions as a contextual boundary condition that influences the strength of the relationship between transformational leadership and organisational commitment. By shifting from a mediation to a moderation framework, this study provides additional insight into the conditions under which leadership effectiveness varies in hierarchical educational systems.

Research questions:

To what extent does transformational leadership influence organizational commitment among primary school teachers in Oman?

How does innovation-oriented culture moderate the relationship between transformational leadership and organizational commitment?

Hypotheses:

Transformational leadership has a significant effect on organisational commitment

## Hypotheses

H1: Transformational leadership has a significant effect on organisational commitment.

H2: Transformational leadership has a significant positive effect on innovation-oriented culture.

H3: Innovation-oriented culture has a significant positive effect on organisational commitment.

H4: Innovation-oriented culture moderates the relationship between transformational leadership and organisational commitment.

H5: Gender is included as a control variable in the leadership–commitment relationship.

## 2 Literature review

### 2.1 Transformational leadership and organizational commitment

Transformational leadership (TL) is a leadership approach that goes beyond transactional exchanges by appealing to followers' higher-order values, moral purpose, and intrinsic motivation (Bass, 1985; Bass and Riggio, 2006). In educational contexts, transformational leaders are expected to enhance teachers' emotional attachment, motivation, and commitment by providing vision, inspiration, and individualized support (Leithwood and Jantzi, 2005).

Empirical research has consistently shown a positive relationship between transformational leadership and organizational commitment in educational institutions (Gyensare et al., 2016; Promchart and Potipiroon, 2020). More recent studies also confirm this positive association, particularly in school systems where leadership is supportive and teachers experience autonomy and empowerment (Alshuhumi et al., 2025; Kareem et al., 2023; Khalid Salim and Abdul Wahab, 2024).

However, recent empirical evidence suggests that this relationship is not universally stable. In highly centralized and bureaucratic educational systems, transformational leadership may have weak or even negative effects on commitment due to structural constraints, workload pressure, and limited decision-making autonomy (Şahin and Bilir, 2024; Vu et al., 2025). These inconsistencies suggest that contextual factors significantly shape the effectiveness of transformational leadership.

From the perspective of social exchange theory (Blau, 1964; Cropanzano and Mitchell, 2005), organizational commitment develops when employees perceive reciprocal support from their organization. In constrained institutional environments, however, transformational leadership may not translate into perceived organizational support, weakening this reciprocal process.

Given these mixed findings and the influence of contextual factors, the relationship between transformational leadership and organizational commitment may vary in direction depending on

the organizational environment. Therefore, this study adopts a non-directional hypothesis:

H1: Transformational leadership has a significant effect on organizational commitment.

### 2.2 Transformational leadership and innovative organizational culture

Transformational leadership is widely recognized as a key driver of organizational culture formation (Bass and Avolio, 1994; Schein, 2010). By articulating vision, stimulating intellectual engagement, and modeling desired behaviors, transformational leaders shape shared values and norms that support innovation (Zuraik and Kelly, 2019).

Innovative organizational culture (IOC) refers to an organizational environment that promotes experimentation, creativity, openness to change, and risk-taking (Lasrado and Kassem, 2021). In educational institutions, such a culture is essential for adapting to changing pedagogical demands and improving teaching effectiveness.

Recent empirical studies confirm that transformational leadership significantly enhances innovation-oriented cultures by promoting psychological safety and collaborative learning environments (Alshuhumi et al., 2025; Iranmanesh et al., 2021; Saddam et al., 2023). Similarly, leadership has been identified as a critical antecedent of organizational innovation across sectors, including education (Jiang et al., 2024; Oke et al., 2009).

However, the effectiveness of transformational leadership in shaping culture depends on contextual enablers such as decentralization, trust, and institutional flexibility. In rigid educational systems, leadership-driven innovation may be constrained by structural barriers that limit the translation of vision into practice (Şahin and Bilir, 2024).

Therefore, this study proposes:

H2: Transformational leadership has a significant positive effect on innovative organizational culture.

### 2.3 Innovative organizational culture and organizational commitment

Innovative organizational culture plays a critical role in shaping employees' psychological attachment to their organization. A culture that encourages collaboration, experimentation, and continuous learning fosters a sense of belonging, psychological ownership, and professional engagement among employees.

Empirical studies show that innovation-supportive cultures significantly enhance organizational commitment by improving job satisfaction, motivation, and perceived organizational support (Alshuhumi et al., 2025; Cobbinah et al., 2020; Saddam et al., 2023). In educational settings, teachers working in innovative environments are more likely to feel valued and emotionally connected to their schools.

Recent research further suggests that organizational culture may exert a stronger direct influence on commitment than leadership itself, particularly in structured public-sector

institutions where cultural norms shape daily behavior more strongly than managerial actions (Iranmanesh et al., 2021).

However, innovation-oriented cultures may also introduce ambiguity and continuous change, which can generate stress if not properly managed (Lasrado and Kassem, 2021). This highlights the importance of balancing innovation with stability in educational institutions.

Thus, this study proposes:

H3: Innovative organizational culture has a significant positive effect on organizational commitment.

## 2.4 Innovative organizational culture as a moderator

Recent leadership literature increasingly emphasizes that the effectiveness of transformational leadership is context-dependent. One key contextual factor is innovative organizational culture (IOC), which shapes how leadership behaviors are interpreted and translated into employee outcomes.

IOC can enhance or constrain the impact of transformational leadership on organizational commitment by providing or limiting the environmental conditions necessary for leadership effectiveness (Jung et al., 2008; Zuraik and Kelly, 2019). In supportive cultures, transformational leadership is more likely to be effective because employees feel safe to innovate and respond positively to leadership initiatives.

Empirical studies confirm that organizational support for innovation strengthens leadership outcomes, particularly in enhancing employee engagement and performance (Iranmanesh et al., 2021; Jiang et al., 2024; Saddam et al., 2023). However, in highly institutionalized environments, the moderating effect of culture may weaken, as structural constraints override interactive effects between leadership and culture (Han et al., 2024).

Despite this growing body of work, the moderating role of IOC in educational settings—especially in Arab primary schools—remains underexplored. Most studies treat culture as a direct predictor or mediator rather than a moderating mechanism.

In this study, innovation-oriented organizational culture is conceptualized strictly as a moderating variable that influences the strength of the relationship between transformational leadership and organizational commitment. It is not treated as a mediating mechanism in this analysis.

Therefore, this study proposes:

H4: Innovative organizational culture moderates the relationship between transformational leadership and organizational commitment.

## 2.5 Gender as a control variable

Gender is included as a control variable because it may influence perceptions of leadership effectiveness and organizational commitment. Research suggests that gendered expectations shape how individuals interpret leadership behaviors, particularly in educational settings (Eagly and Heilman, 2016; Eagly and Karau, 2002).

Studies indicate that female teachers may respond more positively to relational and supportive leadership behaviors, while male teachers may emphasize structural clarity and authority. Additionally, gender differences in leadership perceptions have been widely documented in meta-analytic research.

In Arab educational contexts, gender dynamics may further influence how leadership and organizational culture are experienced due to cultural norms and institutional expectations (Al-Harathi, 2022). Therefore, controlling for gender ensures that the effects of transformational leadership and organizational culture on organizational commitment are not biased by demographic differences.

Thus, gender is included as a control variable in this study.

## 2.6 Theoretical framework

This study is grounded in Social Exchange Theory (SET) and Transformational Leadership Theory, which together provide a comprehensive explanation of the relationships among transformational leadership, innovation-oriented organizational culture, and organizational commitment.

Social Exchange Theory (Blau, 1964; Cropanzano and Mitchell, 2005) posits that social behavior within organizations is shaped by reciprocal exchanges between leaders and followers. In educational settings, when teachers perceive leadership as supportive, inspiring, and development-oriented, they are more likely to reciprocate with positive attitudes such as organizational commitment, loyalty, and engagement. However, SET also emphasizes that such reciprocity is contingent upon contextual conditions, including perceived fairness, trust, and the credibility of leadership actions within the organizational environment.

Transformational Leadership Theory (Bass and Riggio, 2006) explains how leaders influence followers through idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration. These behaviors are generally associated with enhanced motivation, positive work attitudes, and improved organizational outcomes. In school contexts, transformational leadership is expected to foster teacher commitment by aligning individual goals with organizational vision and promoting a sense of purpose.

However, the effectiveness of transformational leadership is not universal and may vary depending on contextual factors within the organization. In highly centralized and structured educational systems, such as those in Oman, institutional constraints may limit teacher autonomy and influence how leadership behaviors are interpreted. As a result, leadership actions may not always translate into increased organizational commitment.

Within this context, innovation-oriented organizational culture plays a critical role as a contextual factor. Rather than functioning as a mediating mechanism, innovation-oriented organizational culture is conceptualized in this study as a moderating variable that influences how leadership behaviors are translated into employee outcomes. Specifically, it represents the extent to which the organizational environment supports innovation, experimentation, and openness to change.

Accordingly, this study adopts a contingency perspective, where the effectiveness of transformational leadership in shaping organizational commitment depends on the broader organizational culture in which it is embedded.

### 2.7 Conceptual framework

The conceptual model of this study consists of three primary constructs: transformational leadership (independent variable), organizational commitment (dependent variable), and innovation-oriented organizational culture (moderating variable).

The model proposes that transformational leadership directly influences organizational commitment. In addition, innovation-oriented organizational culture is hypothesized to have a direct effect on organizational commitment, reflecting its role as a key organizational factor shaping teachers’ attitudes and attachment to their institutions.

More importantly, innovation-oriented organizational culture is conceptualized as a contextual moderator that may strengthen or weaken the relationship between transformational leadership and organizational commitment. This implies that the effectiveness of leadership behaviors depends on whether the organizational environment supports innovation, flexibility, and openness.

However, this study does not assume that such moderation will necessarily occur. Instead, it empirically tests whether innovation-oriented organizational culture alters the strength of the relationship between transformational leadership and organizational commitment.

Control variables, including gender, age, and teaching experience, are included to account for potential demographic influences on organizational commitment.

As illustrated in Figure 1, transformational leadership exerts a direct influence on organizational commitment, while innovation-oriented organizational culture independently influences commitment and is also hypothesized to moderate the leadership–commitment relationship. Importantly, innovation-oriented organizational culture is not modeled as a mediating mechanism in this study, ensuring conceptual consistency with the analytical approach adopted.

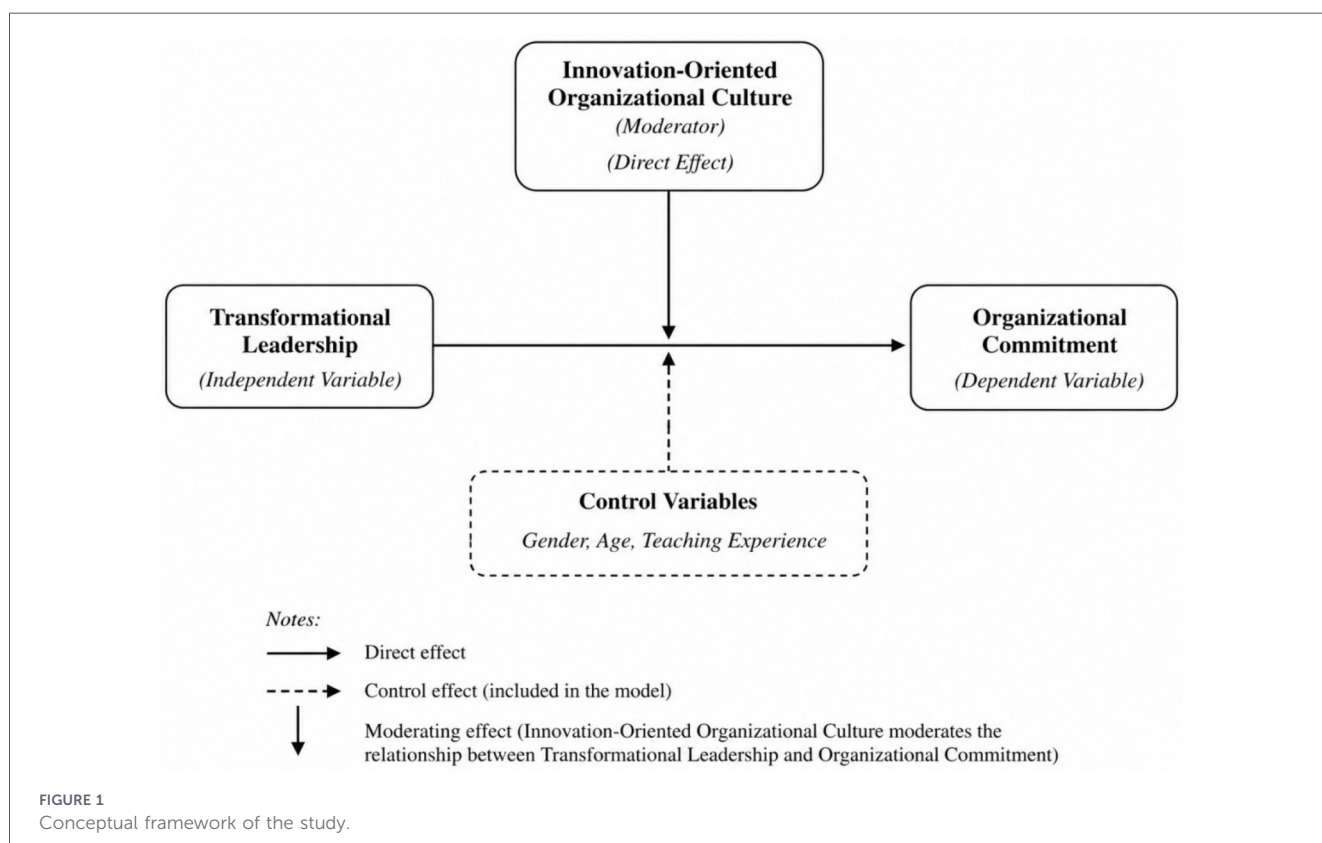
## 3 Methodology

### 3.1 Research design

This study adopted a quantitative, cross-sectional research design to examine the relationships between transformational leadership, innovation-oriented organizational culture, and organizational commitment among primary school teachers in Oman. The design is appropriate for testing hypothesized relationships using statistical modelling, particularly Partial Least Squares Structural Equation Modelling (PLS-SEM).

### 3.2 Population and sample

The population of the study comprised primary school teachers in public schools in Oman. A sample of 368 teachers



was obtained using a stratified random sampling technique to ensure representation across relevant demographic categories such as gender, age, and teaching experience. The sample size is considered adequate for PLS-SEM analysis based on established guidelines for model complexity and statistical power.

The demographic characteristics of the respondents are presented in Table 1. The sample comprised 368 participants, with a relatively balanced gender distribution: 51% male ( $n = 189$ ) and 49% female ( $n = 179$ ). In terms of educational qualifications, the majority of respondents held a bachelor's degree (73%,  $n = 267$ ), followed by postgraduate qualifications (20%,  $n = 74$ ), while a smaller proportion possessed a diploma (7%,  $n = 27$ ).

Regarding years of experience, more than half of the respondents (53%,  $n = 196$ ) had 16 years or more of professional experience. This was followed by those with 11–15 years (26%,  $n = 96$ ), less than 5 years (12%,  $n = 42$ ), and 5–10 years (9%,  $n = 34$ ). These results indicate that the sample is largely experienced and academically qualified, which is suitable for examining leadership and organizational constructs in the educational context.

The demographic characteristics of the respondents are summarized in Table 1.

### 3.3 Research instruments

Data were collected using a structured questionnaire divided into four main sections: transformational leadership, innovation-oriented organizational culture, organizational commitment, and demographic information. All measurement items were adapted from validated scales in prior studies and measured using a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5).

Transformational leadership was measured as a multidimensional construct capturing idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration. Innovation-oriented organizational culture was assessed through dimensions reflecting support for creativity, openness to change, and collaborative learning. Organizational commitment was measured as a multidimensional construct reflecting affective, continuance, and normative commitment.

TABLE 1 Demographic characteristics of respondents ( $N = 368$ ).

Variable	Category	Frequency (N)	Percentage (%)
Gender	Male	189	51
	Female	179	49
Qualification	Diploma	27	7
	Bachelor	267	73
	Postgraduate	74	20
Years of Experience	Less than 5 years	42	12
	5–10 years	34	9
	11–15 years	96	26
	≥16 years	196	53

### 3.4 Validity and reliability

#### 3.4.1 Content validity

Content validity was ensured through expert review by three professors of educational leadership and two senior officials from the Ministry of Education in Oman. Feedback from the experts led to minor linguistic refinements to improve clarity and contextual relevance of the instrument.

#### 3.4.2 Construct validity

Construct validity was assessed using confirmatory measurement model evaluation in SmartPLS 4.0. Indicator loadings exceeded the recommended threshold of 0.70, confirming indicator reliability. Convergent validity was established as all constructs recorded Average Variance Extracted (AVE) values above 0.50.

Discriminant validity was assessed using the Fornell–Larcker criterion and the Heterotrait–Monotrait (HTMT) ratio. All HTMT values were below the recommended threshold of 0.90, confirming adequate discriminant validity among constructs.

#### 3.4.3 Reliability

Internal consistency reliability was assessed using Cronbach's alpha, composite reliability ( $\rho_a$ ), and composite reliability ( $\rho_c$ ). All constructs exceeded the recommended threshold of 0.80, indicating strong reliability. Multicollinearity was assessed using Variance Inflation Factor (VIF), and all values were below 3.0, indicating no multicollinearity issues.

### 3.5 Data collection procedures

Ethical approval for the study was obtained from the Research and Ethics Committee of the Ministry of Education, Oman. Data collection was conducted over a period of three months using a mixed-mode approach, combining both online and paper-based questionnaires.

Participation in the study was voluntary, and respondents were assured of anonymity and confidentiality. Completed questionnaires were screened for completeness and accuracy before being included in the final analysis.

### 3.6 Data analysis techniques

Data analysis was conducted using Partial Least Squares Structural Equation Modelling (PLS-SEM) with SmartPLS 4.0. The analysis followed a two-stage approach: measurement model assessment and structural model assessment.

#### 3.6.1 Measurement model assessment

The measurement model was evaluated based on indicator reliability (outer loadings > 0.70), internal consistency reliability

(Cronbach's alpha and composite reliability > 0.80), convergent validity (AVE  $\geq$  0.50), and discriminant validity (HTMT < 0.90).

### 3.6.2 Structural model assessment

The structural model was evaluated to test the hypothesized relationships among constructs.

Direct effects were assessed for:

Transformational leadership  $\rightarrow$  Organizational commitment

Transformational leadership  $\rightarrow$  Innovation-oriented organizational culture

Moderation analysis was conducted to examine the interaction effect of innovation-oriented organizational culture on the relationship between transformational leadership and organizational commitment. The interaction term (TL  $\times$  IOC) was created using the product-indicator approach.

Bootstrapping with 5,000 resamples was employed to test the significance of path coefficients. Control variables (gender, age, and teaching experience) were included in the model to account for potential confounding effects. Multi-group analysis was conducted for gender where appropriate.

Effect sizes ( $f^2$ ) were used to assess the magnitude of relationships, while predictive relevance ( $Q^2$ ) was assessed using the blindfolding procedure. Model fit was evaluated using Standardized Root Mean Square Residual (SRMR) and Normed Fit Index (NFI).

### 3.6.3 Common method bias

Since the data for this study were collected using a single self-reported questionnaire, common method bias was assessed using Harman's single-factor test. The results revealed that the first factor accounted for 32.12% of the total variance, which is below the recommended threshold of 50%. This indicates that common method bias is not a serious concern in this study.

## 4 Results

### 4.1 Measurement model assessment

The measurement model was evaluated using indicator reliability, internal consistency reliability, convergent validity, and discriminant validity. All indicator loadings exceeded the recommended threshold of 0.70, confirming adequate indicator reliability.

Internal consistency was established using Cronbach's alpha and composite reliability (CR), with all constructs exceeding the minimum threshold of 0.80. Specifically, Cronbach's alpha values ranged from acceptable to excellent levels across all constructs, indicating strong reliability of the measurement scales.

Convergent validity was confirmed as all Average Variance Extracted (AVE) values exceeded 0.50, demonstrating that the constructs explain a sufficient proportion of variance in their indicators.

All values exceed the recommended thresholds (Cronbach's alpha and composite reliability > 0.70; AVE > 0.50), indicating satisfactory reliability and convergent validity as shown in Table 2.

TABLE 2 Reliability and validity results.

Construct	Cronbach's Alpha	Composite Reliability (CR)	AVE
OGCAf	0.948	0.959	0.751
OGCCon	0.974	0.979	0.853
OGCNor	0.976	0.980	0.873
TLIC	0.992	0.994	0.970
TLID	0.944	0.956	0.812
TLIM	0.985	0.988	0.942
TLIS	0.958	0.967	0.854

### 4.1.1 Measurement and structural model results

Discriminant validity was assessed using the Fornell–Larcker criterion and the Heterotrait–Monotrait (HTMT) ratio. All HTMT values were below the conservative threshold of 0.90, confirming that the constructs are empirically distinct and measure different theoretical concepts.

Multicollinearity was assessed using Variance Inflation Factor (VIF), with all values below 3.0, indicating no issues of collinearity among predictor constructs.

All constructs demonstrated satisfactory reliability and convergent validity, as indicated by acceptable threshold values.

Discriminant validity was further examined using the heterotrait–monotrait ratio (HTMT), as shown in Table 3.

The HTMT values were below the recommended threshold, confirming adequate discriminant validity among the constructs. To assess common method bias, Harman's single-factor test was conducted. The results indicate that the first factor accounted for 32.12% of the total variance, which is below the commonly accepted threshold of 50%, suggesting that common method bias is not a serious concern in this study.

—Discriminant validity was assessed using the HTMT criterion. Most values are below the recommended threshold of 0.90, indicating acceptable discriminant validity, although a few values slightly exceed the threshold, suggesting potential overlap between some constructs.

### 4.2 Structural model assessment

The structural model was evaluated using path coefficients, t-statistics, effect sizes ( $f^2$ ), coefficient of determination ( $R^2$ ), and predictive relevance ( $Q^2$ ). Bootstrapping with 5,000 resamples was used to assess statistical significance.

The results of the path coefficients, including beta values, t-values, and significance levels, are presented in Table 4.

Bootstrapping results based on 5,000 resamples indicate that transformational leadership has a statistically significant negative effect on organizational commitment ( $\beta = -0.138$ ,  $p = 0.029$ ). Transformational leadership also significantly predicts innovation-oriented organizational culture ( $\beta = 0.668$ ,  $p < 0.001$ ). In addition, innovation-oriented organizational culture has a

TABLE 3 Discriminant validity (HTMT).

Constructs	OGCAf	OGCCon	OGCNor	TLIC	TLID	TLIM	TLIS	TL	OC
OGCAf	1.000	0.886	0.589	0.670	0.547	0.638	0.682	0.617	0.948
OGCCon	0.886	1.000	0.748	0.472	0.452	0.549	0.523	0.506	0.827
OGCNor	0.589	0.748	1.000	0.558	0.619	0.751	0.702	0.695	0.486
TLIC	0.670	0.472	0.558	1.000	0.712	0.757	0.941	0.728	0.421
TLID	0.547	0.452	0.619	0.712	1.000	0.914	0.874	0.899	0.381
TLIM	0.638	0.549	0.751	0.757	0.914	1.000	0.949	0.960	0.462
TLIS	0.682	0.523	0.702	0.941	0.874	0.949	1.000	0.907	0.454
TL	0.617	0.506	0.695	0.728	0.899	0.960	0.907	1.000	0.438
OC	0.948	0.827	0.486	0.421	0.381	0.462	0.454	0.438	1.000

TABLE 4 Structural model results.

Relationship	B	p-value	Decision
TL → OC	-0.138	0.029	Supported (negative effect)
TL → IOC	0.668	<0.001	Supported
IOC → OC	0.925	<0.001	Supported
TL × IOC → OC	-0.081	>0.05	Not Supported
Gender → OC	-0.246	<0.05	Supported

Significance was assessed using bootstrapping with 5,000 resamples. B, standardized path coefficient; IOC, innovation-oriented culture; TL, transformational leadership; OC, organizational commitment.

strong positive effect on organizational commitment ( $\beta = 0.925$ ,  $p < 0.001$ ). However, the interaction effect between transformational leadership and innovation-oriented organizational culture is negative and not statistically significant ( $\beta = -0.081$ ,  $p > 0.05$ ). Gender also shows a significant negative effect on organizational commitment ( $\beta = -0.246$ ,  $p < 0.05$ ). The structural model results are presented in Figures 2 and 3.

### 4.3 Structural model results (PLS-SEM analysis)

#### 4.3.1 Direct effects

The results show that transformational leadership has a significant positive effect on innovation-oriented organizational culture ( $\beta = 0.668$ ,  $p < 0.001$ ), indicating that transformational leadership practices strongly contribute to the development of an innovation-supportive school environment.

However, transformational leadership demonstrates a negative direct effect on organizational commitment ( $\beta = -0.138$ ), indicating that its direct influence on teachers' commitment is not only unsupported but reverses in direction within the studied context.

In contrast, innovation-oriented organizational culture exhibits a very strong positive effect on organizational commitment ( $\beta = 0.925$ ,  $p < 0.001$ ), making it the most influential predictor of organizational commitment in the model.

#### 4.3.2 Moderation effect

The interaction term between transformational leadership and innovation-oriented organizational culture (TL × IOC) shows a negative and statistically insignificant effect on organizational commitment ( $\beta = -0.081$ ,  $f^2 = 0.016$ ). This indicates that innovation-oriented organizational culture does not significantly moderate the relationship between transformational leadership and organizational commitment.

Accordingly, Hypothesis 3 is not supported. The structural interaction term between transformational leadership and innovation-oriented organizational culture is illustrated in Figure 4.

#### 4.3.3 Explanatory power (R<sup>2</sup>)

The model demonstrates strong explanatory power:

Organizational commitment:  $R^2 = 0.902$

Innovation-oriented organizational culture:  $R^2 = 0.754$

These values indicate that the model explains a substantial proportion of variance in both key endogenous constructs.

#### 4.3.4 Effect sizes (f<sup>2</sup>)

Effect size analysis indicates that:

IOC → OC shows a large effect size, confirming its dominant predictive role.

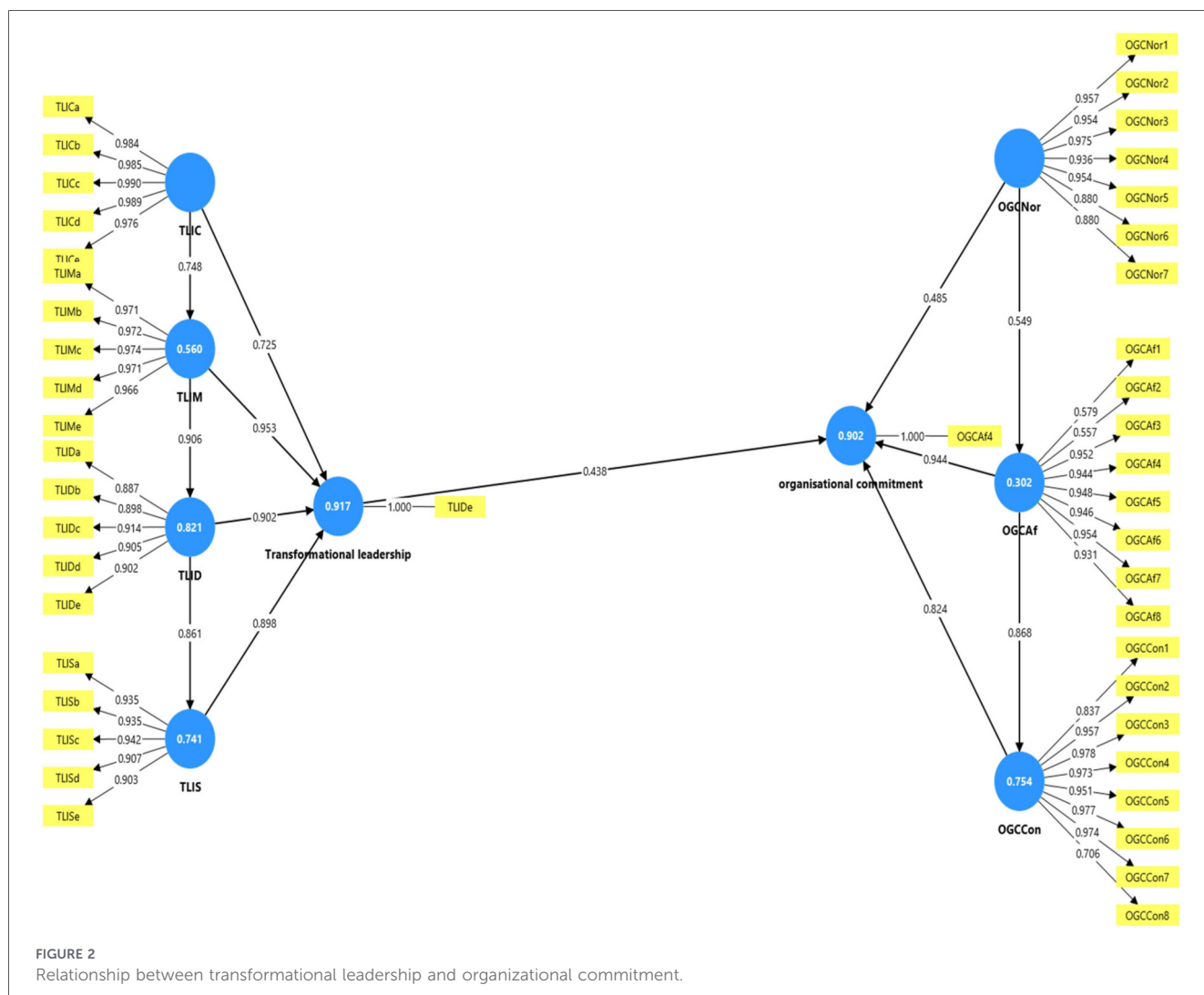
TL → IOC shows a large effect size, indicating strong influence of leadership on culture.

TL → OC shows a small and negative effect size, reinforcing its weak and adverse direct role.

Interaction effect (TL × IOC) shows a negligible effect size, confirming lack of moderation.

#### 4.3.5 Control variable analysis (gender)

Gender was included as a control variable in the transformational leadership–organisational commitment relationship. The results, as shown in figure 6 and table 7, indicate a statistically significant negative effect ( $\beta = -0.246$ ), with a small-to-moderate effect size ( $f^2 = 0.039$ ), suggesting that gender meaningfully influences the strength of this relationship. The model explains a substantial proportion of variance in organisational commitment ( $R^2 = 0.692$ ; Adjusted  $R^2 = 0.690$ ),



and the inclusion of gender did not compromise model stability. These findings indicate that gender plays a relevant role in shaping the transformational leadership–commitment relationship. This is depicted in Figure 5 below:

Gender was coded as male=1 and female=0. The negative coefficient ( $\beta = -0.246$ ) indicates that male teachers report lower levels of organizational commitment compared to female teachers

## 5 Discussion

### 5.1 Transformational leadership and organizational commitment

Contrary to transformational leadership theory, which posits that transformational leaders enhance followers’ emotional attachment and commitment through inspiration, individualized consideration, and intellectual stimulation (Bass, 1985; Bass and Riggio, 2006; Leithwood and Jantzi, 2005), this study found a significant negative direct effect of transformational leadership on teachers’ organizational commitment.

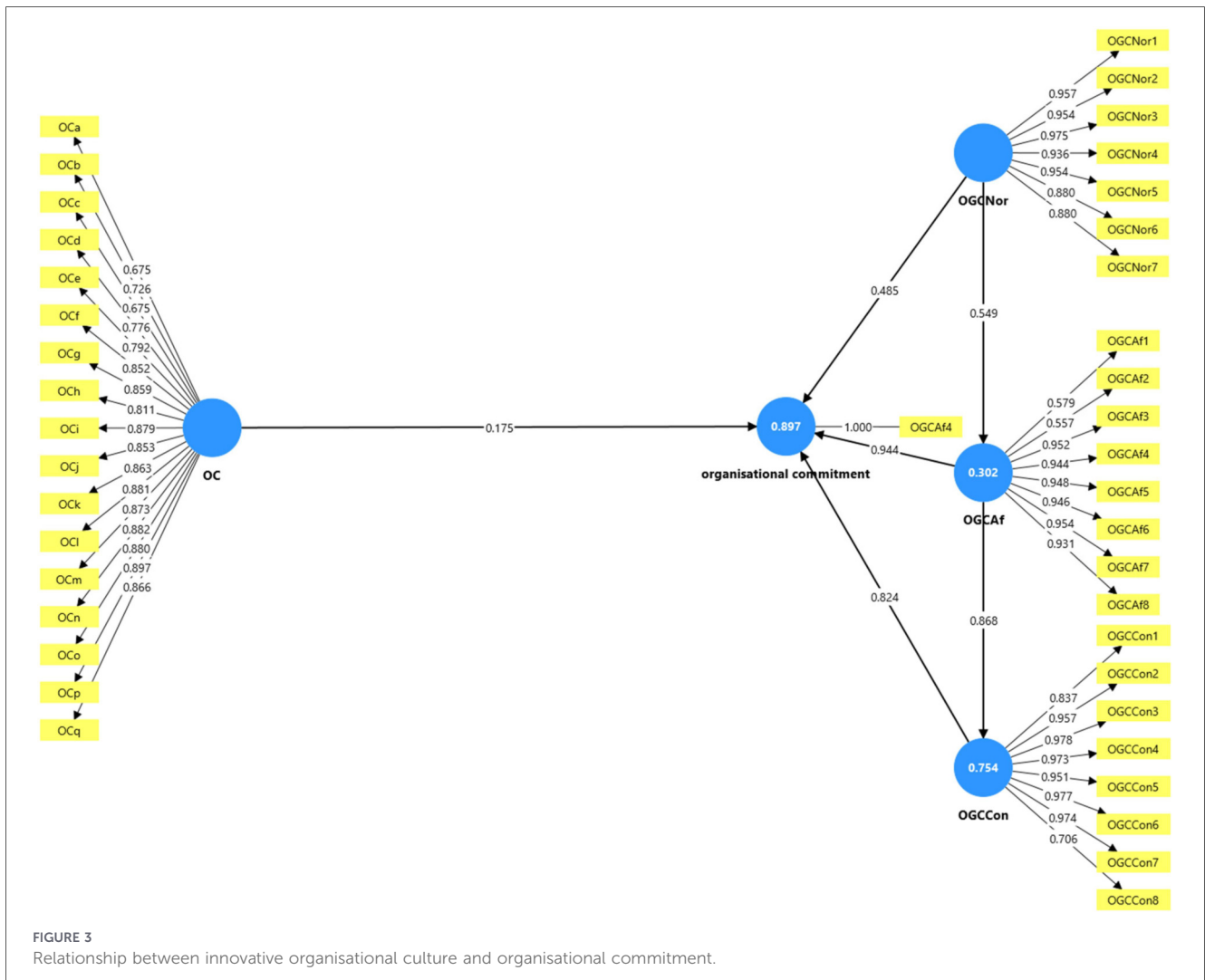
This finding suggests that in the present educational context, transformational leadership does not automatically translate into

stronger psychological attachment to the organization when examined independently of contextual conditions. Similar non-linear and context-dependent effects have been reported in recent studies, where transformational leadership shows weak, insignificant, or even negative associations with attitudinal outcomes in highly centralized or resource-constrained educational systems (Khalid Salim and Abdul Wahab, 2024; Şahin and Bilir, 2024).

One possible explanation is rooted in institutional constraint and role strain dynamics. In highly centralized systems such as Oman’s educational structure, transformational leaders may promote innovation and high performance expectations without corresponding increases in autonomy, resources, or decision-making authority. This mismatch may create role overload and psychological strain among teachers, weakening their organizational attachment.

Recent evidence supports this interpretation, suggesting that transformational leadership can become counterproductive when expectations for innovation exceed institutional capacity, leading to “implementation gap stress” and reduced commitment (Vu et al., 2025).

From a social exchange theory perspective (Blau, 1964; Cropanzano and Mitchell, 2005), organizational commitment



develops when employees perceive reciprocal support from the organization. However, when leadership behaviors are constrained by rigid institutional structures, teachers may perceive a lack of tangible support, weakening reciprocity and reducing commitment.

This unexpected negative relationship may be explained by the centralized nature of the Omani education system, where leadership behaviors may increase expectations and responsibilities without providing corresponding autonomy or resources. As a result, teachers may experience increased pressure, which can reduce their level of organizational commitment.

Thus, the negative relationship observed in this study reflects a context-contingent limitation of transformational leadership, rather than a rejection of the theory itself.

### 5.2 Transformational leadership and innovation-oriented organizational culture

Despite its negative direct effect on organizational commitment, transformational leadership exhibited a strong positive effect on innovation-oriented organizational culture (IOC).

This finding confirms that transformational leaders are effective in shaping organizational values, encouraging

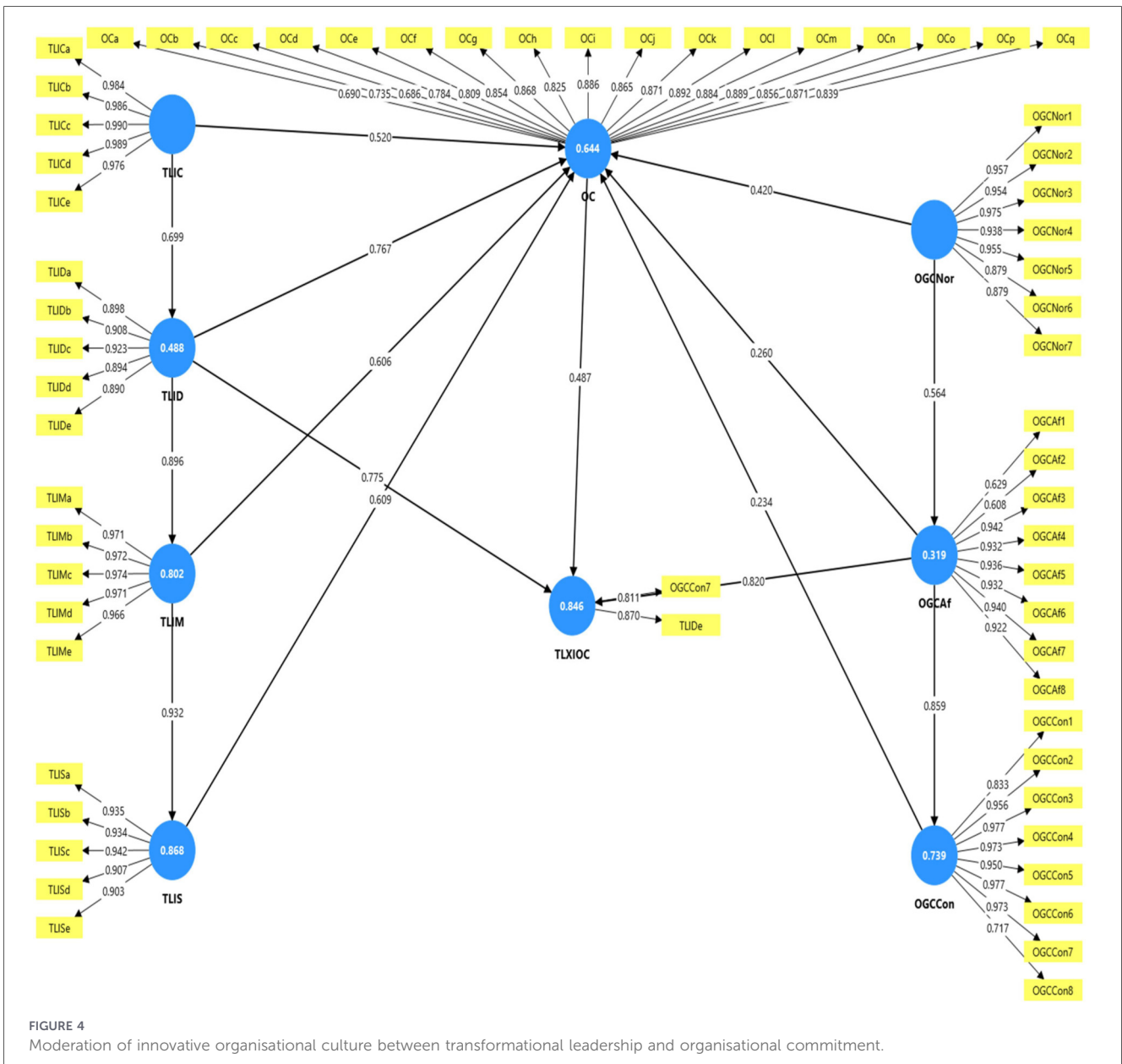
innovation, and fostering collaborative norms even within highly structured educational systems. Recent studies similarly highlight that transformational leadership primarily operates as a cultural transformation mechanism rather than a direct behavioral predictor (Iranmanesh et al., 2021; Zuraik and Kelly, 2019).

In this sense, transformational leaders act as cultural architects, embedding innovation-oriented values into school environments through vision sharing, motivation, and intellectual stimulation. This aligns with recent empirical findings indicating that leadership effects on innovation are often mediated through organizational culture and climate rather than direct attitudinal change (Jiang et al., 2024).

Therefore, while transformational leadership may not directly enhance commitment in this context, it remains a critical antecedent of organizational culture formation.

### 5.3 Innovation-oriented organizational culture and organizational commitment

Innovation-oriented organizational culture emerged as the strongest predictor of organizational commitment in this study.



This indicates that teachers’ emotional and psychological attachment to their institutions is primarily shaped by the quality of the organizational environment rather than leadership behavior alone. When schools promote openness, collaboration, experimentation, and support for new ideas, teachers are more likely to feel valued and remain committed.

This finding is consistent with recent empirical research showing that innovation-supportive cultures enhance employee motivation, satisfaction, and retention in educational institutions (Saddam et al., 2023).

From an organizational behavior perspective, culture functions as a psychological environment of meaning-making, influencing how employees interpret their work experience. A strong innovation-oriented culture enhances psychological safety and strengthens emotional attachment to the institution.

Thus, organizational culture operates as a central mechanism of commitment formation in educational settings.

### 5.4 Moderating role of innovation-oriented organizational culture

Contrary to expectations, innovation-oriented organizational culture did not significantly moderate the relationship between transformational leadership and organizational commitment.

This suggests that transformational leadership and organizational culture operate as independent rather than interactive mechanisms in this context. Leadership influences cultural development, while culture directly influences commitment, but the interaction between both does not significantly amplify or weaken outcomes.

Recent studies support similar findings, indicating that in highly institutionalized or bureaucratic systems, structural constraints limit interaction effects, leading leadership and culture to function in parallel rather than synergistically (Han et al., 2024; Jiang et al., 2024).

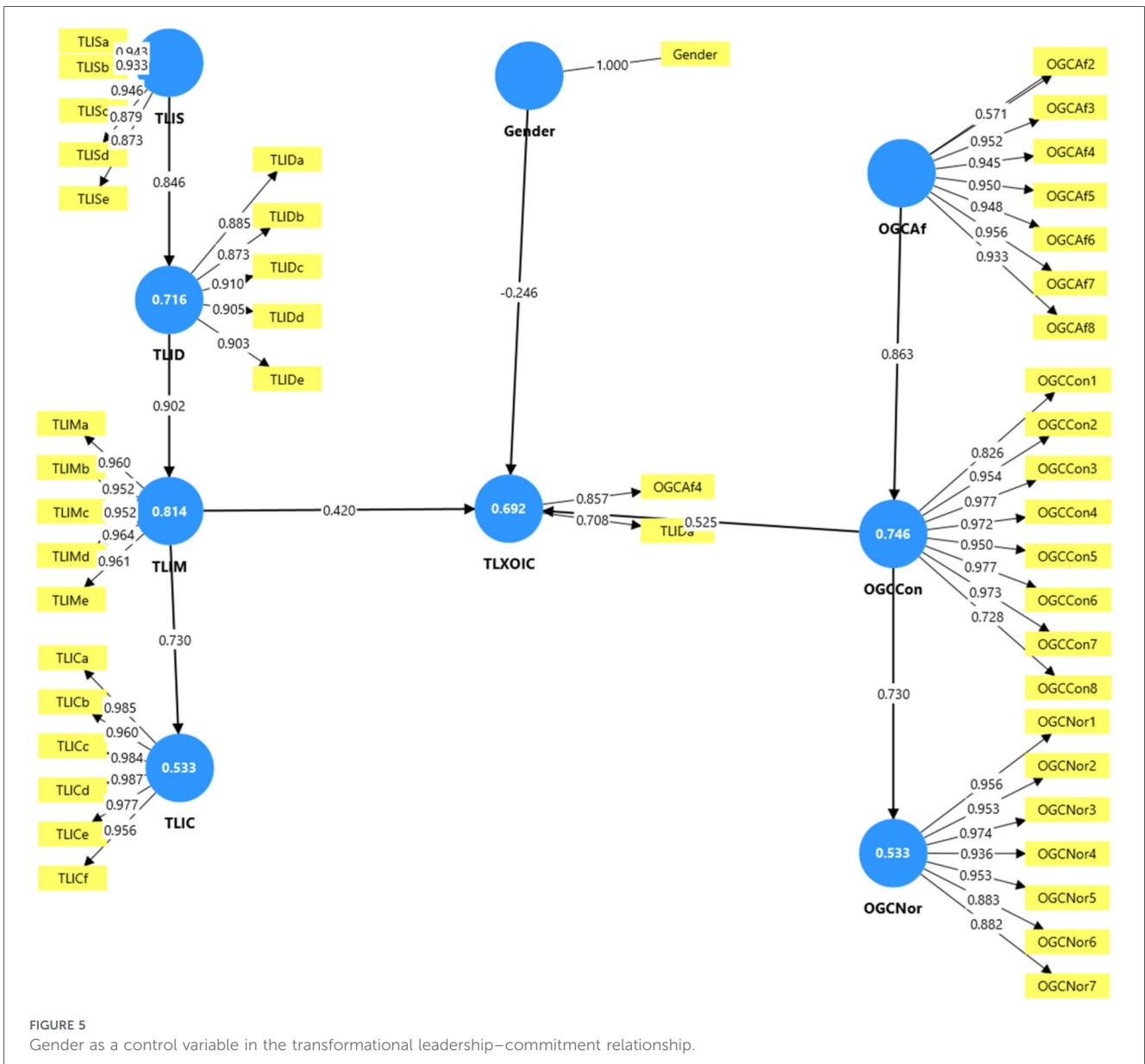


FIGURE 5 Gender as a control variable in the transformational leadership–commitment relationship.

The absence of moderation also suggests that organizational culture has a direct and dominant effect, rather than a buffering or amplifying role in this relationship.

Theoretically, this challenges the assumption that organizational culture always enhances the effectiveness of leadership, highlighting the importance of contextual institutional structures.

### 5.5 Integrated interpretation of the structural model

Overall, the results reveal a culture-dominant explanatory model of organizational commitment.

Specifically:

Transformational leadership significantly enhances innovation-oriented organizational culture

Innovation-oriented organizational culture strongly increases organizational commitment

Transformational leadership does not directly enhance commitment and shows a negative effect

Innovation-oriented culture does not moderate the leadership–commitment relationship

This pattern suggests that transformational leadership influences outcomes indirectly through cultural transformation rather than direct attitudinal change.

This finding aligns with recent indirect-effect models of leadership, which emphasize that leadership impact is often mediated through organizational culture, psychological empowerment, or engagement rather than direct commitment formation.

Thus, the model underscores the mediating dominance of organizational culture in shaping employee commitment.

### 5.6 Theoretical contributions

This study makes three key theoretical contributions.

First, it challenges the universal assumption in transformational leadership theory that leadership directly enhances organizational commitment, demonstrating that this relationship may become negative or non-significant in highly centralized institutional contexts.

Second, it reinforces the dominant role of organizational culture as a direct determinant of employee commitment, supporting recent literature that positions culture as a central explanatory mechanism in organizational behavior.

Third, it reframes transformational leadership as a cultural catalyst rather than a direct behavioral driver, particularly in public-sector educational systems where structural constraints limit leadership autonomy.

Overall, the findings extend transformational leadership theory by highlighting its context-dependent and indirect nature in shaping employee outcomes.

## 5.7 Practical and policy implications

The findings have important implications for educational policy and leadership development.

First, leadership training programs should not assume that improving transformational leadership skills alone will directly increase teacher commitment. Instead, leadership effectiveness depends on the organizational environment in which leaders operate.

Second, policymakers should prioritize strengthening innovation-oriented organizational cultures within schools, as this factor has the strongest direct influence on teacher commitment.

Third, reforms such as Oman Vision 2040 should focus on aligning leadership autonomy with structural flexibility to ensure that leadership practices can translate into meaningful organizational outcomes.

## 6 Conclusion

This study examined the relationship between transformational leadership (TL) and organizational commitment (OC), with innovation-oriented organizational culture (IOC) as both a predictor and a moderating variable, within the context of Omani primary schools. The findings provide important empirical and theoretical insights into how leadership and culture interact to shape teachers' organizational attitudes in a centralized educational system.

The results reveal a complex and non-linear relationship between transformational leadership and organizational commitment. Contrary to widely established theoretical expectations, transformational leadership exhibited a negative direct effect on organizational commitment, suggesting that leadership behaviors alone may not be sufficient to enhance teachers' psychological attachment to their institutions in this context. This finding highlights the importance of considering institutional and structural constraints when evaluating leadership effectiveness in public education systems.

In contrast, innovation-oriented organizational culture emerged as the strongest predictor of organizational

commitment, demonstrating that teachers' commitment is primarily shaped by the quality of the organizational environment rather than leadership behavior alone. Schools that promote innovation, collaboration, and openness are more likely to foster strong emotional and professional attachment among teachers.

Furthermore, transformational leadership was found to have a significant positive effect on innovation-oriented organizational culture, indicating that its primary contribution is indirect. Leadership appears to function as a cultural driver rather than a direct determinant of employee commitment. However, the moderating effect of innovation-oriented organizational culture on the relationship between transformational leadership and organizational commitment was not supported, suggesting that leadership and culture operate as independent rather than interactive forces in this context.

Overall, the findings support a culture-centered explanatory model of organizational commitment, where organizational culture plays a dominant role in shaping teacher attitudes, while transformational leadership contributes indirectly through cultural formation.

## 6.1 Theoretical implications

This study extends transformational leadership theory by demonstrating that its effects are not universally positive or direct. In highly centralized and regulated educational systems, leadership may not directly translate into increased organizational commitment. Instead, its influence is largely mediated through organizational culture.

The findings also reinforce organizational culture theory by confirming that innovation-oriented environments are critical determinants of employee commitment. This puts culture as a central explanatory mechanism in understanding organizational behavior in educational settings.

Additionally, the study contributes to social exchange theory by showing that reciprocal relationships between leadership and commitment may be weakened in contexts where institutional constraints limit the perceived authenticity or effectiveness of leadership behaviors.

## 6.2 Practical implications

The findings offer several important implications for educational policymakers and school administrators.

First, leadership development programs should not assume that transformational leadership alone will directly enhance teacher commitment. Instead, leadership effectiveness should be evaluated within the broader organizational and institutional context.

Second, policymakers should prioritize the development of innovation-oriented school cultures, as these have the strongest direct impact on teacher commitment. This includes fostering collaboration, supporting experimentation, and encouraging professional autonomy.

Third, educational reform initiatives, including those aligned with national development agendas such as Oman Vision 2040,

should focus on aligning leadership practices with structural reforms that enable schools to function with greater flexibility and cultural adaptability.

### 6.3 Limitations and future research

This study is not without limitations. First, its cross-sectional design limits the ability to draw causal inferences. Longitudinal research is recommended to better understand how leadership and culture influence organizational commitment over time.

Second, the study focuses exclusively on primary schools in Oman, which may limit the generalizability of the findings to other educational levels or national contexts. Future studies should consider comparative analyses across different educational systems and countries.

Third, the study relies on self-reported data, which may introduce common method bias. Future research could incorporate multi-source data, including student outcomes or administrative performance indicators.

Finally, future research should explore additional mediating mechanisms, such as job satisfaction, psychological empowerment, or trust in leadership, to further explain the relationship between leadership and organizational commitment.

### 6.4 Final statement

In conclusion, this study highlights the critical role of organizational culture in shaping teacher commitment and demonstrates that transformational leadership, while important, operates primarily through indirect cultural pathways rather than direct attitudinal influence. These findings challenge conventional assumptions in leadership theory and emphasize the need for context-sensitive approaches to understanding organizational behavior in education systems.

## Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

## Ethics statement

The studies involving humans were approved by International Islamic University Malaysia (IIUM) Postdoctoral Research Committee. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their informed consent to participate in this study.

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## Author contributions

SA: Writing – original draft, Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Resources, Validation, Visualization, Writing – review & editing. DA-H: Conceptualization, Writing – original draft, Project administration, Supervision, Visualization. AA: Writing – original draft, Writing – review & editing, Conceptualization, Project administration, Validation, Visualization.

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The author(s) declared that generative AI was used in the creation of this manuscript. Generative AI tools were used to assist with language refinement, formatting, and structural organization of the manuscript. All conceptual development, data analysis, and interpretation of results were conducted by the authors.

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