

Transformational Leadership and Innovative Work Behaviour: Unveiling the Mediating Roles of Job Satisfaction and Employee Engagement

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ABSTRACT

Purpose of the study: This study investigates the influence of transformational leadership on innovative work behaviour among higher education lecturers, utilizing job satisfaction and employee engagement as dual mediating variables. The study aims to provide a comprehensive framework explaining how leadership stimulates innovation through motivational and psychological pathways in academic settings.

Methodology: A quantitative research design was employed involving 206 lecturers selected through purposive sampling. Data were collected using a structured questionnaire and analysed using Partial Least Squares Structural Equation Modeling (PLS-SEM) to evaluate the structural relationships. Validity and reliability tests were conducted to ensure the robustness of the instrument.

Main Findings: The results reveal that transformational leadership significantly enhances job satisfaction, employee engagement, and innovative work behaviour. Crucially, the analysis confirms that both job satisfaction and employee engagement act as significant mediators. These findings imply that transformational leaders foster innovation not only directly but effectively by boosting lecturers' psychological well-being and engagement.

Novelty/Originality of this study: This study contributes to the literature by establishing a dual-mediation model that simultaneously integrates job satisfaction and employee engagement. Unlike previous studies that often examine these mediators separately, this research offers a holistic view of the psychological mechanisms linking leadership to innovation in the higher education context. The study relies on cross-sectional data from a specific higher education sector, which limits the ability to draw causal inferences over time. Future research is encouraged to employ longitudinal designs and expand the scope to diverse geographical regions to enhance generalizability.

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1. INTRODUCTION

Innovative work behaviour (IWB) has emerged as a critical determinant of organizational competitiveness, particularly in environments characterized by rapid change and escalating global competition [1]. In the context of Higher Education Institutions (HEIs), innovation is no longer a mere strategic option but a necessity for survival. As universities face increasing pressures from digital transformation, evolving student

expectations, and global ranking metrics, the ability of lecturers to generate, promote, and realize new ideas is paramount [2], [3]. Lecturers are the academic backbone; their capacity to innovate directly influences the quality of teaching, research output, and institutional resilience [7]. Therefore, understanding the antecedents that foster such behaviour among academic staff is a crucial agenda for educational management.

Transformational leadership is widely recognized as a key driver of innovation. Theoretical frameworks suggest that transformational leaders who inspire vision, stimulate intellect, and provide individual support can empower employees to take risks and experiment with new methods [9], [10]. In educational settings, such leadership is believed to enhance teachers' and lecturers' commitment to change [12]. However, despite the acknowledged importance of transformational leadership, empirical evidence regarding its direct mechanism on innovation remains fragmented and inconsistent. While some scholars argue that leadership directly sparks innovation, others suggest that leadership acts primarily as a trigger for internal psychological states that subsequently drive behaviour.

This inconsistency highlights a critical theoretical gap: the "black box" of psychological mechanisms linking leadership to innovative outcomes remains insufficiently clarified. Relying solely on leadership style is insufficient in the modern academic landscape, where lecturers often face high workloads and burnout. There is an urgent need to understand how leadership can translate into innovation through internal motivational states. Specifically, the role of Job Satisfaction and Employee Engagement as simultaneous pathways has been underexplored. Most prior research has examined these variables in isolation, failing to provide a comprehensive "dual-mediation" framework that explains how emotional fulfillment (satisfaction) and psychological presence (engagement) work together to transmit the influence of leadership into tangible innovative actions.

To address this gap, the present study proposes a comprehensive model grounded in performance theory [13], which posits that optimal performance is a function of competence, motivation, and opportunity. This study argues that transformational leadership creates the "opportunity," while job satisfaction and employee engagement provide the necessary motivation. Job satisfaction creates a supportive emotional environment that encourages commitment [14], while employee engagement fuels the energy and dedication required to overcome the challenges of the innovation process [15].

Consequently, the primary objectives of this study are to: (1) examine the direct influence of transformational leadership on innovative work behaviour among higher education lecturers; and (2) analyze the specific mediating roles of job satisfaction and employee engagement in this relationship. By offering an integrated dual-mediation model, this study contributes to the literature by providing a clearer, more holistic understanding of how educational leaders can effectively stimulate innovation by nurturing the psychological well-being of their staff.

2. LITERATURE REVIEW

Transformational Leadership.

Transformational leadership is an approach in which leaders are able to motivate their followers to achieve organizational goals and demonstrate performance beyond their obligations [16]. Transformational leadership is a process that transforms people and considered effective in influencing subordinates to adapt and innovate to changes needed by the organization [17]. Transformational leadership motivates followers to do more than expected by raising followers' level of awareness of the importance and value of defined and idealized goals, leading followers to transcend their own self-interest for the sake of the team or organization, and moving followers to fulfill higher-level needs [18].

Transformational leadership theory was developed by Bass [19] who explains that transformational leadership has four dimensions, namely idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration. Idealized influence describes the attitudes and behaviour of leaders that inspire pride, respect, and trust from subordinates. Leaders with ideal influence have a clear vision regarding the direction and goals of the organization and are able to articulate and communicate this vision to subordinates [20]. Inspirational motivation describes the ability to motivate and inspire subordinates. A transformational leadership style can inspire subordinates and motivate them to make greater contributions to the organization [21]. Transformational leaders stimulate the intellectual development of their subordinates, fostering intelligence, rationality, and problem-solving abilities. They encourage their employees to think creatively and critically, challenging them to question assumptions and explore new ideas. They create a culture of continuous learning and growth, where employees are encouraged to develop their skills and knowledge. Transformational leadership demonstrates individualized consideration for employees. Leaders with a transformational leadership style are committed to the personal and professional development of their employees. They provide training, mentoring, and support to help their team members grow and succeed. This developmental orientation fosters a culture of continuous learning and improvement, where employees are encouraged to develop their skills and pursue new opportunities.

Innovative Work Behaviour

Innovative work behaviour describes the creation, introduction, and application of new ideas in the work carried out by employees with the aim of improving the performance of individual employees, groups, and organizations [22]. Innovative work behaviour is individual behaviour that aims to provide benefits to individual, group, and organizational performance through the creation and introduction of ideas, work processes, products, or work procedures. According to [23], innovative work behaviour occurs through several stages starting from recognizing problems and creating ideas or solutions, recognizing and seeking support for ideas or solutions, and creating innovations through models or prototypes of these ideas or solutions. Thus, innovative work behaviour is seen as a gradual process. Based on the theory put forward, defines innovative work behaviour as a complex behaviour consisting of three stages, namely idea generation, idea promotion, and idea realization. Innovation begins with the creation of new or useful ideas. These ideas are then introduced or promoted through social activities with the aim of seeking support to strengthen the ideas that have been created. The final stage is the realization of ideas that can be applied in work individually, groups, and organizations.

Job Satisfaction

According to Armstrong and Taylor [24] job satisfaction describes a person's attitudes and feelings toward their job after assessing various characteristics related to their work. A person with a high level of job satisfaction is someone who has a positive assessment of their job, and vice versa, where the level of job satisfaction will decrease when someone has a negative assessment of their job. Kahn [25] also explain that a person's job satisfaction is influenced by their level of involvement with their work (job involvement) and their level of psychological involvement (psychological involvement). The level of involvement with a person's work describes the extent to which a person is involved and identifies with their work. People with high job involvement will strive to produce high performance because they feel that their work is part of who they are. The level of psychological involvement (psychological involvement) describes the extent to which a person is psychologically able to identify how important their work is, thus determining the level of performance they must achieve. The level of performance they desire to achieve reflects the value of their work. Job satisfaction is the attitude and feelings people have toward their jobs. A positive attitude toward work indicates job satisfaction, while a negative attitude indicates job dissatisfaction. A person's assessment of certain aspects of their job will positively influence job satisfaction when the assessment aligns with their expectations. Conversely, when the assessment does not align with expectations, it will reduce job satisfaction [26].

Employee Engagement

Employee engagement describes an individual's attachment, satisfaction, and enthusiasm for their work and organization [27]. This theory emphasizes that employee engagement is not only related to their work but also to the organization. Previous theories indicate that employee engagement is related to both the psychological and physical aspects of employees. Employee engagement is a psychological state that reflects the extent to which an individual is committed and feels connected to their work and organization. There are three main elements that describe employee engagement: cognitive, emotional, and physical engagement. Cognitive engagement relates to the level of attention and concentration an employee gives to their tasks. Emotional engagement describes the positive or negative feelings experienced while performing their work. Employees who feel appreciated, cared for, and respected will have a higher emotional engagement. Physical engagement relates to the level of energy an employee expends during work. Employees who feel physically engaged will demonstrate high commitment and demonstrate maximum effort in performing their tasks. According to [28], employee engagement can be interpreted as a positive antithesis of burnout and focuses on how to improve employee positive conditions as a way to reduce burnout. Engagement is categorized as energy, involvement, and efficacy, which are essentially the opposite of the three dimensions of burnout: exhaustion, cynicism, and feelings of lack of accomplishment. In this approach, someone is said to have a high level of engagement when they have a low level of burnout. This approach to employee engagement is related to the Job Demands-Resources (JD-R) model.

In this model, employee engagement is closely related to the interaction between job demands and job resources [29]. Job demands refer to high work volume, limited time, or emotional challenges. If job demands are too high and employees don't have sufficient resources to cope, this can lead to stress and burnout, which can lower employee engagement. However, if these job demands are balanced with supportive resources, employees will be more motivated to meet the challenges. Job resources are factors that help employees cope with job demands and motivate them to perform well. These resources can include social support, autonomy, feedback, and career development opportunities. When job resources are adequately available, employees feel more valued and have the capacity to grow, which increases employee engagement.

Hypothesis Development***Transformational Leadership-Innovative Work Behaviour***

Transformational leaders positively impact innovative work behaviour by fostering a supportive and creative work environment. By promoting a culture of trust and encouragement, these leaders can enhance employee self-efficacy, thereby bolstering creativity and the willingness to innovate [30]. Studies indicate that when employees perceive their leaders as transformational, they are more likely to engage in innovative practices, as this type of leadership style enhances psychological empowerment and motivates individuals to exceed their standard performance [31]. Research supports that transformational leadership not only motivates employees but also actively involves them in the innovation process by providing the necessary support and resources [32], suggesting that such leadership is crucial for cultivating an innovative organizational culture. Moreover, the interaction between transformational leadership and individual employee traits plays a significant role in determining the extent of innovative work behaviour. Employees who resonate with their transformational leaders, exhibiting high identification with their leaders, are more likely to thrive creatively. This relationship indicates that the effectiveness of transformational leadership is enhanced in environments that are already conducive to creativity and innovation. In addition, factors such as trust in supervisor and levels of uncertainty avoidance are important moderating variables that shape how transformational leadership affects innovative work behaviours. Therefore, we propose the following hypothesis:

H1: Transformational leadership positively influences innovative work behaviour.

Transformational leadership – job satisfaction.

The relationship between transformational leadership and job satisfaction has been widely explored in academic literature, demonstrating a consistent and positive correlation between these constructs. Transformational leadership is characterized by the ability of leaders to inspire, motivate, and implement change effectively within their teams, thereby influencing their followers' job satisfaction positively. One of the primary mechanisms through which transformational leadership enhances job satisfaction is through the development of a supportive work environment. Leaders who adopt a transformational approach often show a high level of individualized consideration, actively fostering their employees' personal and professional growth [33]. This supportive environment leads to increased employee engagement and motivation, which are directly linked with higher job satisfaction levels. For instance, studies have indicated that employees under transformational leaders report elevated job satisfaction due to the leaders' ability to inspire and empower them [34]. In addition, transformational leaders often promote a strong organizational culture that aligns with the values and aspirations of their employees. Such cultural alignment enhances job satisfaction by creating a sense of belonging and recognition among team members [35].

The positive impact of transformational leadership on job satisfaction is further mediated by factors such as employee engagement and empowerment. For instance, the work of Long et al. indicates that transformational leadership not only directly affects job satisfaction but also does so through the mediation of employee empowerment. This illustrates that when employees feel empowered, their satisfaction with their jobs increases, thereby enhancing their overall workplace experience. Furthermore, empirical studies consistently affirm the significant positive relationship between transformational leadership and job satisfaction across various professional settings, including educational institutions and health care environments [36]. For example, in a study involving nurses, transformational leadership was shown to be positively associated with job satisfaction and a willingness to remain in their roles, which is crucial in high-demand professions wherein turnover can adversely impact service delivery [37]. Similarly, research in educational settings highlighted that teachers who experienced transformational leadership were more satisfied with their work [38]. Based on the explanation above, we propose the following hypothesis :

H2: Transformational leadership positively influences job satisfaction.

Transformational leadership-employee engagement.

The relationship between transformational leadership and employee engagement has been extensively researched, revealing a strong connection that emphasizes the transformational leader's role in fostering an engaged workforce. Transformational leaders typically emphasize the importance of individual contributors, promoting a sense of ownership and responsibility among employees, which consequently leads to higher levels of engagement. Leaders who adopt a transformational leadership style can increase employee engagement by providing clear direction, recognizing and rewarding contributions, and offering opportunities for personal and professional competency development [39]. Furthermore, transformational leadership can increase employee engagement by fostering individuals' sense of control and influence over their work, encouraging employees to make decisions and contribute more to their organization [39]. Furthermore, research established a strong positive relationship between transformational leadership and employee engagement, highlighting the effective role of transformational leaders in cultivating an engaged workforce [40]. This aligns with research indicating that employee engagement mediates the relationship between transformational leadership and performance

outcomes, suggesting that leaders who effectively engage their team members can drive higher organizational performance [41]. Additionally, the transformational leadership style actively encourages employees to engage deeply with their work, promoting both fulfillment and higher productivity levels. The positive correlation between transformational leadership, work engagement, and job performance suggests that organizations could benefit significantly from nurturing transformational leadership practices [42]. Thus, the following hypothesis is proposed :

H3: Transformational leadership positively influences employee engagement.

Job satisfaction-innovative work behaviour.

Job satisfaction encompasses an individual's emotional responses to their job roles, and it has been consistently linked to enhanced creativity and innovation in organizational settings [43]. Job satisfaction plays a pivotal role in stimulating innovative work behaviour, as satisfied employees are more likely to take initiative, experiment, and engage in creative problem-solving [44] [45]. This implies that higher levels of job satisfaction foster an environment where employees feel empowered and motivated to propose new ideas and solutions, thus positively influencing IWB. Moreover, studies indicate that when employees perceive their work conditions positively, it nurtures a culture of innovation and supports risk-taking behaviours essential for creative endeavors [46]. Furthermore, research demonstrates that job satisfaction is linked to work engagement and facilitates a climate conducive to innovative work behaviour [47]. Employees who feel satisfied with their jobs often display a proactive stance toward their roles, which enhances their capacity to contribute to organizational innovation [48]. This relationship is further mediated by factors such as psychological empowerment and organizational support, which amplify the effect of job satisfaction on innovative behaviours [49] [50]. This is supported by Kim and Koo, who highlight the interlinkage of job satisfaction, employee engagement, and IWB, indicating that a positive work climate enhances these variables sequentially [51]. According to the above arguments, the following hypothesis is proposed:

H4: Job satisfaction has a positive influence on innovative work behaviour.

Employee engagement-Innovative work behaviour

The relationship between employee engagement and innovative work behaviour is crucial for organizational success, especially in a dynamic and competitive environment. Employee engagement can encourage innovative work behaviour when reinforced by psychological factors such as the extent to which individuals perceive a particular goal or achievement as important or valuable, based on their personal goals, values, or aspirations, and the individual's mindset or mental attitude that focuses on positive things [52]. Engaged employees typically exhibit heightened levels of creativity and motivation, which directly contribute to their willingness to explore new ideas and solutions [53]. Research also found that the quality of the relationship between leaders and employees can influence employee engagement levels, which in turn influences employees' innovative work behaviour [54]. These findings are consistent with research showing that managerial support for employees in companies with a strong corporate image increases employee engagement and encourages innovative work behaviour [55]. Based on the research results that have been explained, we assume that:

H5: Employee engagement has a positive influence on innovative work behaviour.

The mediating role of job satisfaction.

Transformational leaders create a supportive and motivating work environment that enhances employees' psychological well-being and sense of value within the organization. This positive environment strengthens job satisfaction, as employees perceive their work as meaningful, rewarding, and aligned with their personal goals. High job satisfaction, in turn, serves as an intrinsic motivational force that encourages employees to go beyond routine tasks, take risks, and explore creative behaviours that are central to innovation. In this sense, job satisfaction acts as a psychological bridge that connects transformational leadership to innovative outcomes. While transformational leadership directly stimulates innovation through vision and encouragement, its influence is more effective when employees experience high levels of satisfaction with their work. Employees who are satisfied are more likely to respond to transformational leaders by exhibiting innovative behaviours such as idea generation, experimentation, and implementation. Thus, job satisfaction mediates the relationship by channeling the positive effects of transformational leadership into innovative work behaviour, explaining why employees under transformational leaders are more inclined to innovate.

Research indicates that job satisfaction serves as a crucial link that enhances the positive effects of transformational leadership on innovative work behaviours [56] [57]. This suggests that when employees experience high levels of satisfaction, they are more likely to respond positively to their leaders' transformational behaviours, ultimately leading to improved performance and innovative work behaviours. Job satisfaction mediates the relationship between transformational leadership and innovative work behaviour by enhancing employees' motivation and satisfaction [58] Based on the research results that have been explained, we assume that:

H6: Job satisfaction mediates the relationship between transformational leadership and innovative work behaviour.

The mediating role of employee engagement.

Transformational leadership has been widely recognized as an effective leadership style in encouraging innovative work behaviour in employees. Transformational leaders are able to inspire, motivate, and foster a shared vision that transcends personal interests, encouraging employees to think creatively, find new solutions, and contribute to organizational innovation. However, the influence of transformational leadership on innovative work behaviour is not always direct, but often occurs through specific psychological mechanisms, one of which is employee engagement. Employee engagement, which reflects employees' emotional, cognitive, and physical attachment to their work, plays a crucial role in this relationship. Transformational leaders, with charisma, individualized attention, and the ability to provide intellectual stimulation, can foster a high sense of involvement in employees. Engaged employees tend to be more enthusiastic, committed, and willing to invest extra energy in their work. This positive psychological state ultimately increases employees' tendency to exhibit innovative behaviours, such as generating new ideas, proposing process improvements, and implementing creative solutions. Thus, employee engagement serves as a bridge that strengthens the relationship between transformational leadership and innovative work behaviour. Without a high level of engagement, the influence of transformational leadership may not fully direct employees toward innovative work behaviour. Therefore, organizations need to not only develop a transformational leadership style among managers but also create a work environment that encourages employee engagement. The relationship between transformational leadership and innovative work behaviour is a significant focus within organizational psychology, with employee engagement increasingly recognized as a potential mediating variable. Transformational leadership involves leaders who inspire and motivate their followers to exceed their own self-interests for the benefit of the organization, which correlates with enhanced innovative behaviours among employees [26] [27] found that employees' commitment to change serves as a critical mediating variable in the relationship between transformational leadership and innovative behaviour. Furthermore, [59] confirmed the significant impact of transformational leadership on employee work engagement, suggesting a partial mediation effect where increased engagement due to transformational leadership enhances IWB among employees. According to the above arguments, the following hypothesis is proposed:

H7: Employee engagement mediates the relationship between transformational leadership and innovative work behaviour.

3. RESEARCH METHOD

This study employed a quantitative research design with an explanatory approach to investigate the structural relationships among transformational leadership, job satisfaction, employee engagement, and innovative work behaviour. A cross-sectional survey method was utilized to collect primary data, allowing for the assessment of multiple variables simultaneously [60].

The population of this study comprised lecturers employed at higher education institutions. A non-probability purposive sampling technique was employed to select respondents based on specific inclusion criteria: (a) currently holding a permanent or contract lecturer position; (b) working under a direct supervisor (e.g., Head of Department or Dean); and (c) having frequent professional interactions with their supervisor. Based on these criteria, a total of 206 lecturers voluntarily participated in the research. Participation was strictly voluntary, and the anonymity of respondents was guaranteed to reduce social desirability bias.

The demographic profile of the respondents is presented in Table 1. The sample was relatively balanced in terms of gender, with the majority holding a Master's degree and having substantial work experience.

Table 1. Participant Characteristics

Variable	Number of Participants	%
Gender		
Male	106	51
Female	100	49
Education Level		
Master	186	90
Doctoral	20	10
Tenure (years)		
< 3	40	19
3–5	81	39
> 5	85	41

All constructs were measured using validated instruments from previous studies. Responses were recorded on a five-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree. Transformational leadership was measured using items reflecting four key leadership behaviours: articulating a vision, fostering acceptance of group goals, providing individualized support, and stimulating intellectual growth, adapted from Podsakoff et al. in [61]. Innovative work behaviour was assessed using nine items adapted from [62], measuring idea generation, idea promotion, and idea realization. Employee engagement was measured using two six-item subscales (job engagement and organizational engagement) developed by [63]. These items capture an individual's psychological presence, energy, and involvement in their job and institution.

Job satisfaction was measured using a six-item scale adapted from [61], assessing emotional responses and evaluative judgments regarding one's job.

Table 2. Instrument Grid

Construct	Dimensions/Indicators	Number of Items	Source
Transformational Leadership	Vision, group goals, individualized support, intellectual stimulation	—	Podsakoff et al. (1990)
Innovative Work Behaviour	Idea generation, idea promotion, idea realization	9	Janssen (2000)
Employee Engagement	Job engagement, organizational engagement	12	Saks (2006)
Job Satisfaction	Affective job evaluation	6	Weiss et al. (1967)

The questionnaire was distributed online and offline to eligible lecturers. Participants were asked to complete the survey based on their actual experiences with their job and direct supervisor. Data were screened for completeness before analysis. Partial Least Squares Structural Equation Modeling (PLS-SEM) was used to test the research hypotheses and structural relationships among variables. The analysis followed a two-step procedure: 1) Measurement model assessment (validity, reliability, AVE, composite reliability); 2) Structural model assessment (path coefficients, indirect effects, mediation testing, and R^2). PLS-SEM was chosen because it is appropriate for complex models involving mediating variables and does not require normally distributed data.

4. RESULTS AND DISCUSSION

The analysis began with the evaluation of the measurement model (outer model) to ensure the reliability and validity of the instruments. First, individual item reliability was assessed using outer loadings. An indicator is considered reliable if its outer loading value exceeds 0.70. As depicted in Figure 1, all indicators for Transformational Leadership, Job Satisfaction, Employee Engagement, and Innovative Work Behaviour exhibited loadings above 0.70, indicating satisfactory item reliability.

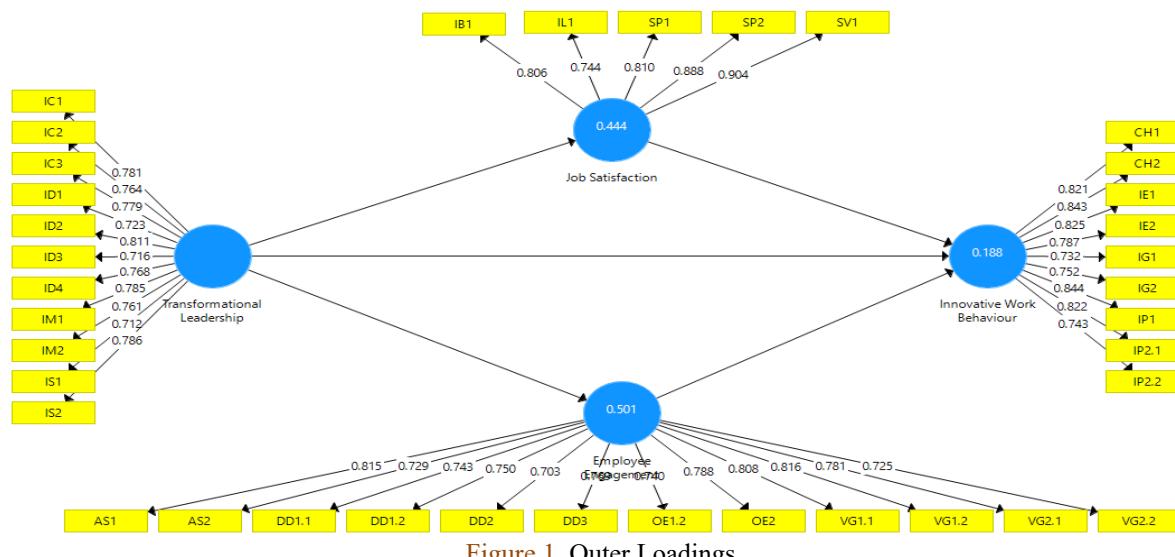


Figure 1. Outer Loadings

Internal consistency was assessed using Cronbach's Alpha (CA) and Composite Reliability (CR). As shown in Table 3, all CA and CR values exceeded the recommended threshold of 0.70, confirming the construct reliability. Furthermore, Convergent Validity was evaluated using the Average Variance Extracted (AVE). The results indicate that all AVE values are above 0.50, demonstrating that the constructs explain more than half of the variance of their indicators.

Table 3. Construct Reliability and Validity

Construct	Cronbach's Alpha	Composite Reliability	Average Variance Extracted
TL	0,929	0,939	0,582
EE	0,899	0,944	0,585
JS	0,935	0,918	0,693
IWB	0,929	0,940	0,636

TL = Transformational Leadership; EE = Employee Engagement; JS = Job Satisfaction; IWB = Innovative work behaviour

Discriminant validity was assessed using the Heterotrait-Monotrait Ratio (HTMT) criterion, which is considered more rigorous than traditional methods. As presented in Table 4, all HTMT values are below the threshold of 0.90, confirming that each construct is empirically distinct from the others.

Table 4. Heterotrait-Monotrait Ratio (HTMT)

Construct	EE	IWB	JS	TL
EE				
IWB	0,338			
JS	0,756	0,332		
TL	0,706	0,450	0,663	

TL = Transformational Leadership; EE = Employee Engagement; JS = Job Satisfaction; IWB = Innovative work behaviour

After validating the measurement model, the structural model (inner model) was evaluated. First, collinearity was checked using the Variance Inflation Factor (VIF). Table 5 shows that all VIF values are below 5.0 (ranging from 1.000 to 2.495), indicating that multicollinearity is not a concern in this study.

Table 5. Collinearity Statistics (VIF)

Construct	EE	IWB	JS	TL
EE		2,495		
IWB				
JS		2,240		
TL	1,000	2,254	1,000	

TL = Transformational Leadership; EE = Employee Engagement; JS = Job Satisfaction; IWB = Innovative work behaviour

The explanatory power of the model was assessed using the Coefficient of Determination (R^2). As shown in Table 6, the model explains 58.8% ($R^2=0.588$) of the variance in Innovative Work Behaviour, which is considered a moderate-to-strong predictive power. Additionally, Transformational Leadership explains 50.1% of the variance in Employee Engagement and 44.4% in Job Satisfaction.

Table 6. R Square

Construct	R Square	R Square Adjusted
EE	0,501	0,498
IWB	0,588	0,585
JS	0,444	0,441

EE = Employee Engagement; IWB = Innovative work behaviour; JS = Job Satisfaction

Hypothesis testing was conducted using a bootstrapping procedure with 5,000 subsamples to assess the significance of the path coefficients ($p < 0.05$). The results are summarized in Table 7.

Table 7. Path Coefficient, Total Effects

Hypothesis	Path Coefficient	p values	Result
H1: TL → IWB	0,430	0,000	Supported
H2: TL → JS	0,666	0,000	Supported
H3: TL → EE	0,708	0,000	Supported
H4: JS → IWB	0,056	0,000	Supported
H5: EE → IWB	0,031	0,001	Supported
H6: TL → JS → IWB	0,022	0,001	Supported
H7: TL → EE → IWB	0,037	0,001	Supported

The statistical analysis confirms that Transformational Leadership (TL) has a significant direct effect on Innovative Work Behaviour (IWB) ($\beta=0.430$, $p<0.001$), supporting H1. This suggests that leaders who articulate a vision and stimulate intellect directly encourage lecturers to innovate. Furthermore, TL significantly enhances both Job Satisfaction ($\beta=0.666$) and Employee Engagement ($\beta=0.708$), supporting H2 and H3. Regarding the mediators, both Job Satisfaction and Employee Engagement positively influence IWB, supporting H4 and H5. Crucially, the mediation analysis confirms the indirect paths. The path TL \rightarrow JS \rightarrow IWB is significant ($\beta=0.022$, $p=0.001$), confirming H6. Similarly, the path TL \rightarrow EE \rightarrow IWB is significant ($\beta=0.037$, $p=0.001$), confirming H7

These findings validate the proposed Dual-Mediation Model. They indicate that while transformational leadership is a powerful driver of innovation, its impact is significantly transmitted through the psychological mechanisms of satisfaction and engagement. The results imply that merely demanding innovation from lecturers is insufficient; leaders must first cultivate an environment that fosters high job satisfaction and engagement to unlock innovative potential. The primary objective of this study was to elucidate the mechanism through which transformational leadership influences innovative work behaviour among higher education lecturers. The empirical results demonstrate that transformational leadership serves as a critical antecedent to innovation, operating both directly and indirectly through psychological pathways.

First, the finding that Transformational Leadership (TL) positively influences Innovative Work Behaviour (IWB) confirms that leaders who articulate a compelling vision and provide intellectual stimulation are essential in fostering an academic culture of innovation. This result aligns with previous studies [62], which argue that transformational leaders encourage employees to challenge the status quo without fear of failure. In the context of higher education, this implies that when Deans or Department Heads support risk-taking, lecturers are more confident in developing new teaching methods or research agendas.

Second, this study reveals the significant mediating role of Job Satisfaction (JS). Transformational leaders enhance lecturers' satisfaction by meeting their intrinsic needs for growth and recognition. Once satisfied, lecturers develop a positive emotional state that broadens their cognitive flexibility—a prerequisite for creativity. This finding supports the Affective Events Theory and is consistent with recent research [63]–[65], which posits that satisfied employees are more willing to engage in extra-role behaviours like innovation.

Third, Employee Engagement (EE) was found to be a robust mediator. This supports the Job Demands-Resources (JD-R) model, suggesting that transformational leadership acts as a vital "job resource" that fuels lecturers' energy and dedication [66]. Unlike job satisfaction which is an attitude, engagement is a state of active psychological presence. The results indicate that engaged lecturers possess the vigor required to overcome the obstacles inherent in the innovation process (idea promotion and realization). This extends the work of [67] by confirming that engagement is the "engine" that converts leadership inspiration into tangible innovative actions.

Theoretically, this study contributes to the literature by establishing a Dual-Mediation Model. While prior research often examined satisfaction and engagement in isolation, this study demonstrates that they operate simultaneously as distinct pathways. Job satisfaction provides the emotional readiness (willingness), while employee engagement provides the psychological energy (capability) to innovate. This offers a more holistic explanation of the "black box" between leadership and innovation in academic settings. Practically, the findings suggest that higher education institutions cannot rely solely on demanding innovation from their staff. Instead, they must focus on the antecedents. Leadership Development: Universities should train academic leaders not just in administration, but in transformational competencies—specifically, how to inspire vision and provide individual support. Enhancing Satisfaction: Administrators must remove bureaucratic hurdles that cause dissatisfaction and create a rewarding environment (e.g., recognition for creative research). Fostering Engagement: To boost engagement, institutions should ensure lecturers have sufficient autonomy and resources, preventing burnout which is detrimental to innovation.

Despite its contributions, this study has limitations that offer directions for future research. First, the cross-sectional design restricts the ability to draw definitive causal inferences. Future studies should employ longitudinal designs to track how changes in leadership style impact innovation over time. Second, the data relies on self-reports, which may introduce common method bias. Future research could benefit from multi-source data, such as assessing innovative behaviour from the perspective of peers or supervisors. Finally, the

study was conducted in a specific higher education context; generalizing these findings to other industries or cultural settings requires further empirical validation.

5. CONCLUSION

This study establishes that transformational leadership is a vital catalyst for enhancing innovative work behaviour among higher education lecturers. Crucially, the findings unveil that this leadership influence is not merely direct but is significantly amplified through the Dual-Mediation mechanism of job satisfaction and employee engagement. Transformational leaders succeed in fostering innovation by first cultivating a supportive work environment that elevates employees' positive psychological states. Specifically, this study concludes that job satisfaction acts as an affective pathway, creating the "willingness" to innovate, while employee engagement provides the necessary psychological energy and presence to execute innovative ideas. Without these two internal conditions, the external pressure to innovate is unlikely to succeed.

Theoretically, this research contributes to the organizational behaviour literature by validating a comprehensive model where satisfaction and engagement operate simultaneously as distinct yet complementary routes linking leadership to innovation. Practically, the results suggest that higher education institutions aiming to boost their competitiveness must move beyond simple performance mandates. Instead, they should adopt a human-centric strategy: developing transformational leaders who prioritize the well-being and engagement of their faculty. By nurturing these psychological foundations, universities can create a sustainable ecosystem where innovation thrives naturally.

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AUTHOR CONTRIBUTIONS

HS was responsible for the research design, data collection, data analysis, and manuscript preparation. SP, contributed to conceptual development, research methodology guidance, and critical review of the manuscript. All authors have read and approved the final version of the manuscript.

CONFLICTS OF INTEREST

The author(s) declare no conflict of interest.

USE OF ARTIFICIAL INTELLIGENCE (AI)-ASSISTED TECHNOLOGY

The authors declare that no artificial intelligence (AI) tools were used in the generation, analysis, or writing of this manuscript. All aspects of the research, including data collection, interpretation, and manuscript preparation, were carried out entirely by the authors without the assistance of AI-based technologies.

REFERENCES

- [1] S. J. Shin, F. Yuan, and J. Zhou, "When perceived innovation job requirement increases employee innovative behavior: a sensemaking perspective," *Journal of Organizational behavior*, vol. 38, no. 1, pp. 68-86, 2017, doi: 10.1002/job.2111.
- [2] M. A. West and J. L. Farr, "Innovation at work: Psychological Perspectives," *Social Behaviour*, vol. 4, no. 1, 1989.
- [3] O. Janssen, "Job demands, perceptions of effort-reward fairness and innovative work behavior," *Journal of Occupational and Organizational Psychology*, vol. 73, no. 3, pp. 287-302, 2000, doi: 10.1348/096317900167038.
- [4] K. Janoskova, and P. Kral, "Innovation measurement: An extensive literature analysis," In *SHS Web of Conferences* (Vol. 129, p. 05003). EDP Sciences, 2021, doi: 10.1051/shsconf/202112905003.
- [5] R. A. Elfita and H. Agustina, "Innovation, Current And Future Firms Performance (Study On Manufacturing Firms Listed On Indonesia Stock Exchange 2016-2018)," in *Proceedings of the 2nd International Conference on Business and Management of Technology (ICONBMT 2020)*, Atlantis Press, pp. 95–101, 2021.
- [6] J. de Jong and D. Hartog, "Measuring Innovative Work Behaviour," *Creativity and Innovation Management*, vol. 19, no. 1, pp. 23-36, 2010, doi: 10.1111/j.1467-8691.2010.00547.x.
- [7] B. Afsar and W. Umrani, "Transformational leadership and innovative work behaviour," *European Journal of Innovation Management*, vol. 23, no. 3, pp. 402-428, 2019, doi: 10.1108/EJIM-12-2018-0257.
- [8] N. O. Abd El Muksoud, F. G. Metwally, and A. A. Ata, "Leadership behaviors and innovative work behaviors among nurses," *Zagazig Nursing Journal*, vol. 18, no. 2, pp. 1-14, 2022, doi: 10.1186/s12912-025-03618-4.
- [9] N. Alwahhabi, S. Dukhaykh, and W. B. Alonazi, "Thriving at work as a mediator of the relationship between transformational leadership and innovative work behavior," *Sustainability*, vol. 15, no. 15, pp. 11540, 2023, doi: 10.3390/su151511540.
- [10] A. Ismail and A. A. Mydin, "The impact of transformational leadership and commitment on teachers' innovative behaviour," in *4th ASEAN Conference on Psychology, Counselling, and Humanities (ACPCH 2018)*, Atlantis Press, pp. 426–430, 2019, doi: 10.2991/acpch-18.2019.100.
- [11] S. P. Robbins and T. A. Judge, *Organizational Behavior: Global Edition*, Pearson Education Limited, 2022.

- [12] M. Aslan and H. Atesoglu, "The effect of innovation and participation as workplace values on job satisfaction and the mediating effect of psychological ownership," *Sage Open*, vol. 11, no. 4, 2021, doi: 10.1177/21582440211061530.
- [13] P. Pukkeeree, K. Na-Nan, and N. Wongsuwan, "Effect of attainment value and positive thinking as moderators of employee engagement and innovative work behaviour," *Journal of Open Innovation: Technology, Market, and Complexity*, vol. 6, no. 3, pp. 69, 2020, doi: 10.3390/joitmc6030069.
- [14] I. Buil, E. Martínez, and J. Matute, "Transformational leadership and employee performance: The role of identification, engagement and proactive personality," *International Journal of Hospitality Management*, vol. 77, pp. 64-75, 2019, doi: 10.1016/j.ijhm.2018.06.014.
- [15] P. Northouse, *Leadership: Theory and Practice*, 7th ed., SAGE, 2016.
- [16] G. A. Yukl, *Leadership in Organizations*, Prentice-Hall, 2013.
- [17] A. El-Amin and B. George, "Towards a model and strategy for transformational change," *Economics, Management and Sustainability*, vol. 5, no. 2, pp. 28-38, 2020, doi: 10.14254/jems.2020.5-2.2.
- [18] K. F. Anjorin, M. A. Raji, and H. B. Olodo, "A Review of Strategic Decision-Making In Marketing Through Big Data And Analytics," *Computer Science & IT Research Journal*, vol. 11, no. 1, 84-91, 2024, doi: 10.30574/msarr.2024.11.1.0077
- [19] T. Joel and V. Oguanobi, "Leadership and Management in High-Growth Environments: Effective Strategies For The Clean Energy Sector," *International Journal of Management & Entrepreneurship Research*, vol. 6, no. 5, pp. 1423-1440, 2024, doi: 10.51594/csitrj.v5i5.1139.
- [20] T. Tanti, W. Utami, D. Deliza, and M. Jahanifar, "Investigation in vocation high school for attitude and motivation students in learning physics subject," *Journal Evaluation in Education (JEE)*, vol. 6, no. 2, pp. 479-490, 2025, doi: 10.37251/jee.v6i2.1452.
- [21] J. L. Farr and C. M. Ford, "Individual innovation," In M. A. West & J. L. Farr (Eds.), *Innovation and creativity at work: Psychological and organizational strategies* (pp. 63–80). John Wiley & Sons, 1990.
- [22] S. G. Scott and R. A. Bruce, "Determinants of innovative behavior: a path model of individual innovation in the workplace," *Academy of Management Journal*, vol. 37, no. 3, pp. 580-607, 1994, doi: 10.5465/256701.
- [23] O. Janssen, "Job demands, perceptions of effort-reward fairness and innovative work behavior," *Journal of Occupational and Organizational Psychology*, vol. 73, no. 3, pp. 287-302, 2000, doi: 10.1348/096317900167038.
- [24] M. Armstrong and S. Taylor, *Armstrong's Handbook of Human Resource Management Practice*, 15th ed., Kogan Page, 2020.
- [25] W. A. Kahn, "Psychological conditions of personal engagement and disengagement at work," *Academy of Management Journal*, vol. 33, no. 4, pp. 692-724.1990, doi: 10.5465/256287.
- [26] B. Shuck, "Integrative literature review: Four emerging perspectives of employee engagement," *Human Resource Development Review*, vol. 10, no. 3, pp. 304-328, 2011, doi: 10.1177/1534484311410840.
- [27] A. B. Bakker and W. B. Schaufeli, "Job demands, job resources, and their relationship with burnout and engagement: A multi-sample study," *Journal of Organizational Behavior: The International Journal of Industrial, Occupational and Organizational Psychology and Behavior*, vol. 25, no. 3, pp. 293-315, 2004, doi: 10.1002/job.248.
- [28] B. Afsar and M. Masood, "Transformational leadership, creative self-efficacy, trust in supervisor, uncertainty avoidance, and innovative work behaviour of nurses," *The Journal of Applied Behavioural Science*, vol. 54, no. 1, pp. 36-61, 2017, doi: 10.1177/0021886317711891.
- [29] A. Chaubey, C. K. Sahoo, and N. Khatri, "Relationship of transformational leadership with employee creativity and organizational innovation: A study of mediating and moderating influences," *Journal of Strategy and Management*, vol. 12, no. 1, pp. 61–82, 2019, doi: 10.1108/JSMA-07-2018-0075.
- [30] R. L. Tung, "New perspectives on human resource management in a global context," *Journal of World Business*, vol. 51, no. 1, pp. 142–152, 2016, doi: 10.1016/j.jwb.2015.10.004.
- [31] M. V. Romi, E. Efendi, E. Chandra, V. Candra, and A. Sudirman, "Analysis of employee engagement with transformational leadership and organizational climate as predictors," *International Journal of Social Science and Human Research*, vol. 6, no. 10, pp. 6357–6362, 2023, doi: 10.47191/ijsshr/v6-i10-74.
- [32] A. Maria, H. Yulianto, D. Palupiningtyas, and H. Usodo, "Relationship between transformational leadership, proactive personality, creative self-efficacy and employee creativity at food processing SMEs in Indonesia," *Evidence-Based HRM: A Global Forum for Empirical Scholarship*, vol. 10, no. 2, pp. 257-274, 2022, doi: 10.1108/EBHRM-03-2021-0033.
- [33] G. Gebreheat, H. Teame, and E. I. Costa, "The impact of transformational leadership style on nurses' job satisfaction: An integrative review," *SAGE Open Nursing*, vol. 9, pp. 1–13, 2023, doi: 10.1177/23779608231197428.
- [34] N. Nelmi, N. Nurmala, and N. Faliza, "The influence of transformational leadership, non-physical work environment, and compensation on employee job satisfaction PT. Perta Arun Gas (PAG) Lhokseumawe," *J-MIND (Jurnal Manajemen Indonesia)*, vol. 8, no. 2, pp. 115–128, 2024, doi: 10.29103/j-mind.v8i2.13785.
- [35] S. Mustaqim, "Transformational leadership, job satisfaction and organizational commitment," *Psychology and Education Journal*, vol. 58, no. 2, pp. 2503–2512, 2021, doi: 10.17762/pae.v58i2.2263.
- [36] C. S. Long, G. C. Fei, M. A. Kowang, and T. O. Kowang, "Transformational leadership, empowerment, and job satisfaction: The mediating role of employee empowerment," *Human Resources for Health*, vol. 14, no. 1, p. 73, 2016, doi: 10.1186/s12960-016-0171-2.
- [37] R. S. Guevara, J. A. Montoya, M. Carmody-Bubb, and C. Wheeler, "Physician leadership style predicts advanced practice provider job satisfaction," *Leadership in Health Services*, vol. 34, no. 1, pp. 46–60, 2020, doi: 10.1108/LHS-02-2020-0004.
- [38] G. Gebreheat, H. Teame, and E. I. Costa, "The impact of transformational leadership style on nurses' job satisfaction: An integrative review," *SAGE Open Nursing*, vol. 9, pp. 1–13, 2023, doi: 10.1177/23779608231197428.

- [39] R. S. Arifiani, A. Sudiro, and N. K. Indrawati, "The role of organizational culture and job satisfaction in mediating the effect of transformational leadership on organizational citizenship behavior," *Jurnal Aplikasi Manajemen*, vol. 18, no. 2, pp. 262–272, 2020, doi: 10.21776/ub.jam.2020.018.02.07.
- [40] E. Manao, M. Saleh, and M. Metroyadi, "The relationship between the transformational leadership style of school principals, assertive communication, and working climate on job satisfaction of private elementary school teachers in North Banjarbaru District," *International Journal of Social Science and Human Research*, vol. 06, no. 06, pp. 3390–3397, 2023, doi: 10.47191/ijsshr/v6-i6-54.
- [41] O. Abdul-Azeez, A. Ogadimma, and C. Idemudia, "Transformational leadership in SMEs: Driving innovation, employee engagement, and business success," *World Journal of Advanced Research and Reviews*, vol. 21, no. 2, pp. 783–791, 2024, doi: 10.30574/wjarr.2024.21.2.0465.
- [42] S. Farzana and P. Charoensukmongkol, "Effects of transformational leadership on psychological empowerment and employee engagement: A comparative study of Bangladesh and Thailand," *Journal of Asia Business Studies*, vol. 18, no. 1, pp. 1–22, 2024, doi: 10.1108/JABS-09-2021-0376.
- [43] H. Ibrahim, M. Rodzi, and M. Zin, "Factors influencing employee engagement in a financial institution," *Annals of Contemporary Developments in Management & HR*, vol. 3, no. 2, pp. 20–28, 2021, doi: 10.33166/ACDMHR.2021.02.004.
- [44] J. Park, S. J. Han, J. Kim, and W. Kim, "Structural relationships among transformational leadership, affective organizational commitment, and job performance: The mediating role of employee engagement," *European Journal of Training and Development*, vol. 46, no. 9, pp. 920–936, 2022, doi: 10.1108/EJTD-10-2020-0147.
- [45] F. Y. Lai, H. C. Tang, S. C. Lu, Y. C. Lee, and C. C. Lin, "Transformational leadership and job performance: The mediating role of work engagement," *SAGE Open*, vol. 10, no. 1, 2020, doi: 10.1177/2158244019899055.
- [46] Y. Tang, Y. F. Shao, and Y. J. Chen, "Assessing the mediation mechanism of job satisfaction and organizational commitment on innovative behavior: The perspective of psychological capital," *Frontiers in Psychology*, vol. 10, Art. no. 2699, 2019, doi: 10.3389/fpsyg.2019.02699.
- [47] L. Chaudhary, G. Rohilla, N. Verma, A. Aakansha, V. Verma, P. Pal, and S. Gupta, "Review of workplace characteristics and self-motivation as indicators of nurses' job satisfaction," *International Journal of Biological and Pharmaceutical Sciences Archive*, vol. 6, no. 2, pp. 120–126, 2023, doi: 10.30574/ijbpsa.2023.6.2.0048.
- [48] E. Efriyah, "The influence of organizational culture on work motivation, work satisfaction and innovative behavior in improving employee performance," in *Proc. 1st Int. Conf. Economics, Management, Accounting and Business (ICEMAB 2018)*, Medan, Indonesia, Oct. 8–9, 2018, pp. 44–53, doi: 10.5220/0009700300440053.
- [49] H. Sun, L. Lee, and H. W. V. Tang, "A theoretical study on the network structure of transformational leadership and teacher job satisfaction based on the four paths framework," *Journal of Roi Kaensarn Academi*, vol. 9, no. 1, pp. 109–125, 2024, doi: 10.60144/jba.2024.9.1.08.
- [50] N. Hidayati, D. Budiman, C. M. Dewi, E. Handayani, and H. Maango, "The relationship between job stress and employee job satisfaction: A multivariate analysis approach in an organizational context," *West Science Business and Management*, vol. 1, no. 2, pp. 88–96, 2023, doi: 10.58812/wsbtm.v1i02.73.
- [51] R. Ziegler and C. Schlett, "An attitude strength and self-perception framework regarding the bi-directional relationship of job satisfaction with extra-role and in-role behavior: The doubly moderating role of work centrality," *Frontiers in Psychology*, vol. 7, Art. no. 235, 2016, doi: 10.3389/fpsyg.2016.00235.
- [52] M. S. Kim and D. W. Koo, "Linking LMX, engagement, innovative behavior, and job performance in hotel employees," *International Journal of Contemporary Hospitality Management*, vol. 29, no. 12, pp. 3044–3062, 2017, doi: 10.1108/IJCHM-01-2016-0046.
- [53] P. Pukkeeree, K. Na-Nan, and N. Wongswan, "Effect of attainment value and positive thinking as moderators of employee engagement and innovative work behaviour," *Journal of Open Innovation: Technology, Market, and Complexity*, vol. 6, no. 4, p. 124, 2020, doi: 10.3390/joitmc6040124.
- [54] K. M. Kananu, K. Ambrose, and T. Joel, "The effect of employee engagement on the relationship between leader-member exchange and innovative work behaviour in Kenya," *Journal of Business and Economic Development*, vol. 5, no. 3, pp. 148–155, 2020, doi: 10.11648/j.jbed.20200503.14.
- [55] F. Contreras, G. Abid, M. Govers, and N. Saman Elahi, "Influence of support on work engagement in nursing staff: The mediating role of possibilities for professional development," *Academia Revista Latinoamericana de Administración*, vol. 34, no. 1, pp. 120–136, 2021, doi: 10.1108/ARLA-06-2020-0153.
- [56] K. Roz, "Job satisfaction as a mediation of transformational leadership style on employee performance in the food industry in Malang city," *International Journal of Economics Business and Accounting Research (IJEBAR)*, vol. 3, no. 3, pp. 268–275, 2019, doi: 10.29040/ijebar.v3i3.593.
- [57] S. Abid, N. Rafique, and M. Raza, "Leadership styles impacting innovative work behaviour with moderating role of job satisfaction," *Journal of Management Sciences*, vol. 10, no. 1, pp. 16–30, 2023, doi: 10.20547/jms.2014.2301002.
- [58] K. Jun and J. Lee, "Transformational leadership and followers' innovative behavior: Roles of commitment to change and organizational support for creativity," *Behavioral Sciences*, vol. 13, no. 2, p. 120, 2023, doi: 10.3390/bs13020120.
- [59] H. K. Gemedo and J. Lee, "Leadership styles, work engagement and outcomes among information and communications technology professionals: A cross-national study," *Heliyon*, vol. 6, no. 4, Art. no. e03719, 2020, doi: 10.1016/j.heliyon.2020.e03719.
- [60] P. M. Podsakoff, S. B. MacKenzie, R. H. Moorman, and R. Fetter, "Transformational leader behaviors and their effects on followers' trust in leader, satisfaction, and organizational citizenship behaviors," *The Leadership Quarterly*, vol. 1, no. 2, pp. 107–142, 1990, doi: 10.1016/1048-9843(90)90021-T.
- [61] A. M. Saks, "Antecedents and consequences of employee engagement," *Journal of Managerial Psychology*, vol. 21, no. 7, pp. 600–619, 2006, doi: 10.1108/02683940610690169.

- [62] C. M. Nguyen and M. T. Ha, "The interplay between internal communication, employee engagement, job satisfaction, and employee loyalty in higher education institutions in Vietnam," *Humanities & Social Sciences Communications*, vol. 10, no. 1, pp. 1-13, 2023, doi: 10.1057/s41599-023-01806-8.
- [63] J. Hair, G. T. Hult, C. Ringle, and M. Sarstedt, *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*, Sage, 2022.
- [64] H. A. Aimang and B. O. Gallardo, "Teacher emotional intelligence and classroom leadership dynamics in differentiated learning", *Jor. Eva. Edu*, vol. 6, no. 3, pp. 900-907, 2025, doi: 10.37251/jee.v6i3.1658.
- [65] E. Ariani, B. Patrick, and M. Karimi, "Evaluation of using odua weston jambi hotel services: The influence of internship student service quality on consumer satisfaction", *Jor. Eva. Edu*, vol. 5, no. 2, pp. 61-67, 2024, doi: 10.37251/jee.v5i2.929.
- [66] D. Herlo, E. Ambrosio, and P. Galcheva, "Analysis of the application of the group investigation learning model and its influence on students' critical thinking abilities on chemical elements in eastern europe", *Jor. Eva. Edu*, vol. 4, no. 4, pp. 144-150, 2023, doi: 10.37251/jee.v4i4.785.
- [67] A. R. Syahrul, S. Suryana, H. Hendrayati, and C. Furqon, "The dynamics of entrepreneurship education in higher education: The role of family background and environment in developing entrepreneurial skills", *Jor. Eva. Edu*, vol. 6, no. 2, pp. 590-600, 2025, doi: 10.37251/jee.v6i2.1540.