



The role of academic leadership in enhancing faculty engagement and job satisfaction: A pathway to advancing quality education

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ABSTRACT

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The study investigates the influence of academic administrator leadership practices on faculty engagement and job satisfaction in higher education, particularly emphasizing the advancement of Sustainable Development Goal 4 (quality education). Transformational, transactional, and supportive leadership styles were analyzed concerning faculty involvement, work happiness, and psychological empowerment. Data was collected from Saudi universities, including public and private, and the respondents comprised 990 faculty members who willingly participated in the research. Data was collected using a quantitative approach with well-crafted questionnaires. The study employs Structural Equation Modeling - Partial Least Squares (SEM PLS) to assess the impact of leadership on SDG 4. The study revealed that transformational and transactional leadership greatly affect teacher engagement and job satisfaction with perceived institutional support and psychological empowerment as mediators. Faculty satisfaction responded more strongly directly from transactional leadership than transformative leadership. The results underline the need for balanced leadership approaches to improve education quality. Policymakers and academic institutions trying to raise faculty involvement, satisfaction, and institutional performance in the higher education sector will find great value in this study. Additionally, the study provides practical recommendations for improving faculty engagement and advancing the goals of quality education (SDG 4).

Contribution/Originality: This paper pioneers tying transformational, transactional, and supporting leadership to SDG 4 in Saudi higher education emphasizing transactional leadership's direct influence on faculty satisfaction and mediators like empowerment. By use of balanced leadership styles, it provides feasible ways to improve the quality of education.

1. INTRODUCTION

Higher education's leadership policies significantly affect faculty engagement and job satisfaction, which eventually shape the quality of the taught education. Effective leadership creates the conditions fit for academic performance, drive, and dedication. Deeper research of leadership dynamics in academia has been demanded by the growing worldwide focus on Sustainable Development Goal 4 (SDG 4) (Bhatnagar & Singh, 2024) which seeks to provide inclusive and fair quality education.

Transformational leadership empowers teachers with a common goal and promotes creative teaching strategies through personal support (Maker, 2021). Conversely, transactional leadership emphasizes performance-based assessments, rewards, and well-defined objectives. Though transformational leadership inspires long-term commitment as it does, it offers clear goals and concrete rewards that raise work satisfaction (Adeniji et al., 2020).

Faculty well-being also depends much on supportive leadership which is distinguished by mentoring and professional growth opportunities.

The theoretical basis of this work includes transformational leadership theory (Berkovich, 2016), the Job Demands- Resources (JD-R) model (Tummers & Bakker, 2021) and Social Exchange Theory (SET) (Ali, Anshari, Hamdan, Ahmad, & Surieshtino, 2023). Transformational leadership's approach emphasizes how much engaging faculty members depends on visionary leaders. The JD-R model helps to balance job requirements with resources at hand, therefore affecting job satisfaction by using institutional support and workload. SET stresses the reciprocal relationship between teachers and administrators wherein supporting leadership generates greater institutional engagement.

This study uses structured questionnaires in a quantitative research method to evaluate leadership styles among Saudi institutions. A group of faculty members from five public and three private institutions participated to guarantee different points of view. Relationships among work satisfaction, faculty involvement, and leadership styles were examined using structural equation modeling (SEM-PLS).

This study adds to the body of already published material by examining how leadership affects faculty motivation, especially in Saudi higher education institutions. It offers information for university officials trying to raise faculty job happiness and increase academic leadership effectiveness, therefore enhancing the conditions of student learning.

2. REVIEW LITERATURE

The influence that the leadership practices of academic administrators have on the level of engagement and work satisfaction experienced by faculty members is of utmost importance in the pursuit of Sustainable Development Goal 4 (quality education). Several theories can explain faculty engagement and job satisfaction in the institution. The present dynamic is explained by several different theories, such as the transformational leadership theory (Bass, 1999) which emphasizes inspiring and motivating followers, the job demands- resources (JD-R) model (Bakker & Demerouti, 2007) which investigates the equilibrium between job demands and resources, and the social exchange theory (SET) (Cropanzano & Mitchell, 2005) which emphasizes the reciprocal relationships that exist between faculty and administrators. The literature review makes use of the transformational leadership theory as the most appropriate framework, with a particular emphasis on factors such as supporting, transactional, and transformational leadership techniques. Facilitating teacher involvement and satisfaction with work is essential for a high-quality educational environment. Psychological empowerment, organizational support, faculty demographics, and workload concerns mediate these practices as illustrated in Figure 1.

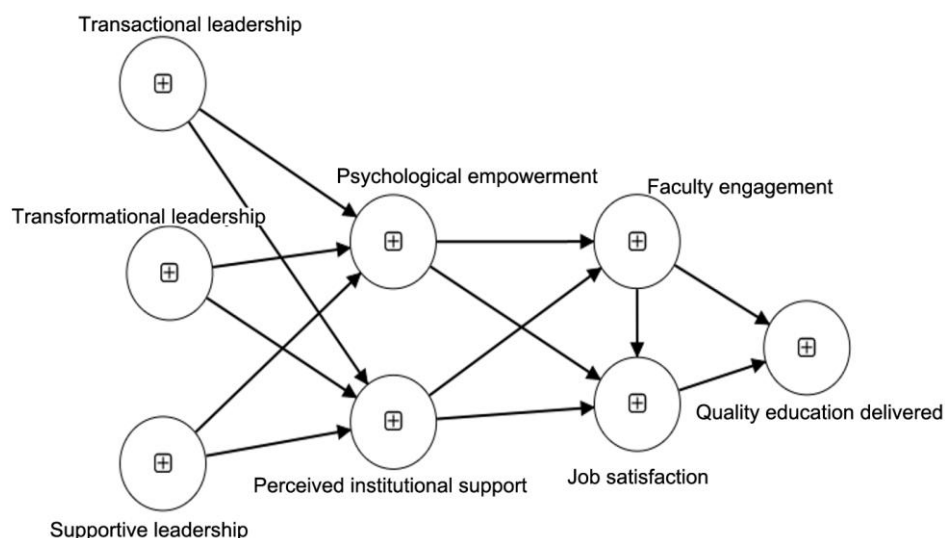


Figure 1. Conceptual framework of study

Transformational leadership is widely applied in educational settings and positively influences teacher job satisfaction, commitment and self-efficacy (Firmansyah, Prasojo, Jaedun, & Retnawati, 2022). Transformational leadership has a notable impact on generating processes of change within organization not only in managerial aspects but also of a social nature (Capuñay, Santa María, Ramírez, Falla, & Salazar, 2024).

2.1. Transformational Leadership Traits

Daniel Goldman's emotional intelligence model demonstrates the relationship between emotional intelligence and transformational leadership traits (Barling, Slater, & Kelloway, 2000). Personality and self-concept are pivotal in predicting such leadership effectiveness (Perreault, Cohen, & Blanchard, 2016). Core traits like idealized influence, inspiration motivation, intellectual stimulation, and individualized consideration—the latter strongly tied to job satisfaction define transformational leaders (Long, Yusof, Kowang, & Heng, 2014). They also enhance workplace safety and employee well-being by fostering supportive environments (Thibault, Gulseren, & Kelloway, 2019). Middle-leaders' agreeableness and openness further strengthen leadership impact and teacher commitment (Zadok & Benoliel, 2023).

Transformational leaders elevate the status of a job from mundane to something meaningful, prompting followers to engage in innovative work behavior (Pradhan & Jena, 2019). It can drive employees towards meaning, purpose, and interconnectedness with the organization's goals and values, thus inspiring and motivating them (Mack, Udechukwu, & Mujtaba, 2014). Transformational leadership ignites followers' work engagement, leading to better task performance and helping behaviors (Lai, Tang, Lu, Lee, & Lin, 2020). Transformational leadership inspires and motivates followers through their unique relationships with leaders, creating follower engagement. Studies have witnessed that it stimulates followers to show personal initiative and use their strengths, which predicts work engagement and job performance (Bakker, Hetland, Olsen, & Espevik, 2023). It is positively related to followers' job crafting behavior, particularly when followers have a promotion focus (Hetland, Hetland, Bakker, & Demerouti, 2018).

Transformational leaders inspire and motivate their followers by elevating job status, fostering workplace spirituality, igniting work engagement, fostering follower engagement, stimulating personal initiative and strengths use, encouraging job crafting, and motivating commitment to organizational goals.

2.2. Transformational Leaders Use to Empower and Develop Their Followers

Transformational leadership aligns with promotion-focused strategies, enhancing follower effort through regulatory fit (Hamstra, Van Yperen, Wisse, & Sassenberg, 2014). It cultivates work engagement, fostering behaviors that improve task performance and collaboration (Lai et al., 2020). This style boosts engagement and outcomes when leaders exemplify its principles by leveraging followers' strengths and initiative (Bakker et al., 2023). Promotion-focused followers under such leadership proactively reshape roles, gaining resources (Hetland et al., 2018) while trust and empowerment drive innovation, moderated by engagement (Li et al., 2019). In academia, it elevates job satisfaction, curbing turnover and underscoring its value for employee well-being (Tentama & Kusuma, 2019) thereby informing policies to strengthen leadership efficacy (Samad, Muchiri, & Shahid, 2022).

2.3. Transactional Leadership in Education

A form of leadership style known as transactional leadership, sometimes known as transactional management, emphasizes the transfer of experience, expertise, resources or effort between superiors and those they supervise. When it comes to achieving a desired result, this style of leadership emphasizes individual interests and extrinsic incentives over intrinsic motivation. To accomplish short-term objectives, it makes use of a system that balances rewards and punishments (Wilkinson & Downton, 1974).

The relationship between transactional leadership and job satisfaction has been observed in public organizations, including universities and schools (Alarabiat & Eyupoglu, 2022; Khaliq, Malik, Waseem, & Farooqi, 2024).

2.4. Key Components of Transactional Leadership in Academic Settings

Transactional leadership and collaborative behaviour shown in organisational environments were predictive of comparable behaviour in academic environments, therefore stressing the need for consistent behavioural traits across contexts. The need for these elements in transactional leadership, role identification and self-awareness gradually added to the prediction of comparable leadership and collaboration behaviors in academic settings. Research on the validation scale for measuring transactional leadership style found components, such as ideal behavior, encouraging mental, and individual considerations, ideal features, active management based on exceptions and contingent rewards as integral to this leadership style (Nazem & Gheytasi, 2014). The influence of transactional leadership, particularly dependent compensation, on academic leaders' performance was examined, demonstrating how it affects job performance in higher education institutions (Mahdinezhad, Bin Suandi, bin Silong, & Omar, 2013).

In higher education, faculty engagement is a vital idea affected by several elements like quality of work-life and leadership styles (Ali, Ullah, & Haque, 2023; Hanley, Maykrantz, & Houghton, 2024). Transactional leadership is positively related to talent engagement and development in academic settings (Ali et al., 2023). Emotional intelligence was identified as a crucial skill for academic leadership with relationship management, empathy, self-management, and self-awareness being critical emotional intelligence abilities for academic leadership leading to more staff (Asmamaw & Semela, 2023).

Transactional leadership has been shown to have a positive impact on the psychological empowerment of university faculty, which influences their organizational commitment (Huang, Liu, & Huang, 2021). A study highlighted the positive effects of transformational and contingent reward leadership on faculty's psychological empowerment and organizational commitment with psychological empowerment mediating these relationships (Huang et al., 2021). Empowering leadership was found to be related to academics' work engagement through job autonomy, the social community at work, and unreasonable tasks, emphasizing the importance of empowering leadership in enhancing work engagement (Helland, Christensen, & Innstrand, 2020). A study at a public university in Malaysia found that transformational and transactional leadership positively influenced psychological empowerment which in turn had a positive relationship with task performance (Ambad, Kalimin, Ag Damit, & Andrew, 2021).

2.5. Supportive Leadership in Education

The type of leadership known as supportive leadership is one in which an executive does not merely delegate responsibilities and wait for the results but rather assists an employee until the task is finished. Supportive leadership is linked to effective communication, collaborative working practices, and performance management practices (Uman, Argento, Grossi, & Mattei, 2024). It is also characterized by behaviors, such as providing autonomy support, recognition, and integrity (Hocine & Zhang, 2014).

2.6. Characteristics of Supportive Leadership in Academic Settings

Effective academic leadership involves being visionary and committed to the school/staff and creating a collegial/supportive work environment (Morrison, 2018). Leaders in academic contexts need to demonstrate supportive behaviors, such as support for development, integrity, sincerity, and formal acknowledgment (Shirazi et al., 2014). Through the cultivation of effective communication channels, the acquisition of commitment, and the formation of teams and coalitions, a great academic leader creates alignment and connections among individuals

(Smith, Williams, Owen, Rubenstein, & Chaney, 2008). Inspiring and energizing, encouraging and empowering the entire team to attain their goals are the hallmarks of a successful academic leader.

The morale of faculty members has a substantial impact on faculty behavior, productivity, and the quality of instruction, which ultimately affects the learning of students and the overall quality of the program (Hebert, 2019). There is a positive relationship between supportive leadership and job happiness with communication and collaborative working practices serving as mediators of this relationship (Uman et al., 2024). Effective leadership communication produces a favorable environment that inspires staff members and increases job satisfaction (Suppiah, Ling, Pakirathan, & Ahmad, 2021).

2.7. Psychological Empowerment

Psychological empowerment (PE) encompasses emotional and cognitive dimensions, influencing diverse facets of individual well-being and environments (Christens, Byrd, Peterson, & Lardier, 2018; Speer, Peterson, Christens, & Reid, 2019). PE significantly moderates the relationship between leadership styles, job satisfaction, and faculty involvement. Research shows that PE positively affects employee engagement (Sefnedi, Puspita, & Tiara, 2023) and mediates the relationship between empowerment and job satisfaction. Empowering leadership styles also enhance psychological capital, work engagement, and well-being among employees. Psychological well-being and work engagement act as effective mediators while psychological capital does not mediate empowering leadership's impact on job happiness (Yassin & Hasyim, 2022). Thus, PE is vital for boosting engagement and satisfaction in organizations.

PE's link to job satisfaction stems from meaningful work (Karizme, Pordanjani, & Ebrahimi, 2016; Meng & Han, 2014). Studies consistently highlight its role in connecting leadership and satisfaction while also enhancing commitment, involvement, and performance (Allam, 2017).

2.8. Perceived Institutional Support

The correlation between work satisfaction among faculty members and leadership styles depends much on perceived organizational support (POS). Studies have revealed that POS may greatly raise work satisfaction and faculty involvement by serving as a mediator between leadership styles and these results. All of this effects faculty work satisfaction. It also encourages good behaviors, such as organizational citizenship, and dedication, and lessens emotional tiredness. Furthermore, POS is supposed to manage the relationship between leadership actions and faculty job satisfaction in the framework of servant leadership. This emphasizes the need for organizational assistance in the process of developing favorable work attitudes and involvement (Dahleez & Aboramadan, 2022).

Perceived organizational support (POS) greatly affects employee loyalty by improving a good work environment and hence increasing commitment. Studies have indicated that POS improves employee organizational commitment (Artatanaya, Supiatni, Kencanawati, Marhaeni, & Muderana, 2023) hence fostering more loyalty and participation (Sihag, 2021). Furthermore, important in determining workers' impressions of the value of their efforts and concerns for their well-being which shapes their loyalty is POS (Koomson, 2022). All of which can either positively mediate or moderate the relationship between POS and employee loyalty are total quality management (TQM), information communication technology adoption (ADT), government support (GOS), and co-worker support (COS). Encouraging loyalty and dedication among the workforce depends mostly on a favourable organizational climate that values and supports its people.

3. RESEARCH METHODOLOGY

The present research uses quantitative research for the study of employing questionnaire assessment (Sandelowski, 2000). The chosen methodology is aligned with the objectives to examine the impact of academic administrator leadership practices on faculty engagement and job satisfaction in higher education. The chosen

strategy is explanatory to establish and explain the relationship among the variables. In the study, the data is collected using cross-sectional (Zangirolami-Raimundo, de Oliveira Echeimberg, & Leone, 2018) methodology, hence, allowing data collection from faculties from different fields of academic domains and different universities in Saudi Arabia. A structured questionnaire is used using a self-assessment Google Form from faculties across different universities of Saudi Arabia for data collection. The collection of data is managed by personal connection through the proper channel and through the university communication mode. In the study, both inferential as well as descriptive analysis is employed for the optimization of the examination process. The inferential method by Al-Aufi and Al-Azri (2013) provides an examination of relationships across variables and assesses the pattern of relationships whereas descriptive analysis provides a broader overview of the data. Hence, integrating both approaches can have a wider understanding of the concept. The Structured Equational Modeling with Partial Least Square (SEM-PLS) method is used to analyze data in the study as it can handle larger as well as optimal sets of data (Becker, Cheah, Gholamzade, Ringle, & Sarstedt, 2022).

3.1. Data Collection

In the present study, faculty members from different domains across different Saudi universities including 5 public universities and 3 private universities from different geographic locations of the kingdom. A multi-level sampling technique is used in the study. Purpose sampling is used to ensure an equal distribution of public and private universities in the study. Moreover, it could also ensure that the universities have been chosen from different geographic locations of the kingdom. The rationale for employing this methodology is to avoid common biases among the participants (Zaman, 2021). It also boosts reliability and validity in analyzing the data. The decision to collect data from 3 public universities and 2 private because they have distinct features and capabilities, including the types of establishment and infrastructure they deliver to their stakeholders may vary considerably. Hence, a thorough assessment impact of academic administrator leadership practices on faculty engagement and job satisfaction in higher education in Saudi universities could be accessed and understood more broadly. The minimum size of the sample for the present should not be less than 900 as it is advised that the sample should be at least ten times the largest number of structural paths directed toward a specific construct in the structural model (Leguina, 2015). Moreover, it is also advisable to have a larger set of samples as it can improve statistical power, accuracy, coherence, and dependability of estimations (Hair, Black, Barry, Anderson, & Tatham, 2006; Hair, 2023). 1200 respondents were sent the questionnaire and out of that 990 filled responses were taken for data analysis excluding the responses that were filled randomly.

3.2. Source of Data

3.2.1. Secondary Source

The secondary data is collected from Scopus and Web of Science-indexed journals that have helped build a concrete framework for the study towards the foundation of the theory.

3.2.2. Surveys

The study conducted surveys by Rowley (2014) to investigate faculty engagement and job satisfaction influenced by different leadership styles in the academic institutions of Saudi Arabia putting psychological empowerment and perceived institutional support as a mediating factor in the study. The participants were the faculties who are working in different colleges and universities (see Annexure II).

4. STATISTICAL PROCESSING OF DATA

The study employed a methodical approach for data analysis encompassing descriptive data.

4.1. Descriptive Analysis

The initial stage involved a comprehensive and meticulous descriptive examination of the gathered data. This technique utilized descriptive statistics to analyze the distribution, core tendencies, and variations in academic accomplishment, motivation for sustainability, psychological empowerment and the digital learning environment. The study aimed to uncover intrinsic patterns and characteristics in the information by examining these descriptive statistics.

4.2. Inferential Analysis using Structural Equation Modelling (SEM)

The inferential analysis step looks beyond descriptive statistics at the complex interactions and links among the research variables usually carried out by Structural Equation Modelling (SEM) (Hooper & Coughlan, 2008). Robust statistical method structural equation modelling analyze complicated models containing many variables continuously concurrently. In this instance, the mediating variable, psychological empowerment, the dependent variable, academic performance and Structural Equation Modelling (SEM) were applied to examine the relationships between the independent variables, specifically the motivation for sustainability and the digital learning environment. The study aims to investigate the impact of leadership styles on work satisfaction by use of Structural Equation Modelling (SEM), therefore obtaining a better knowledge of the interrelationships among these elements.

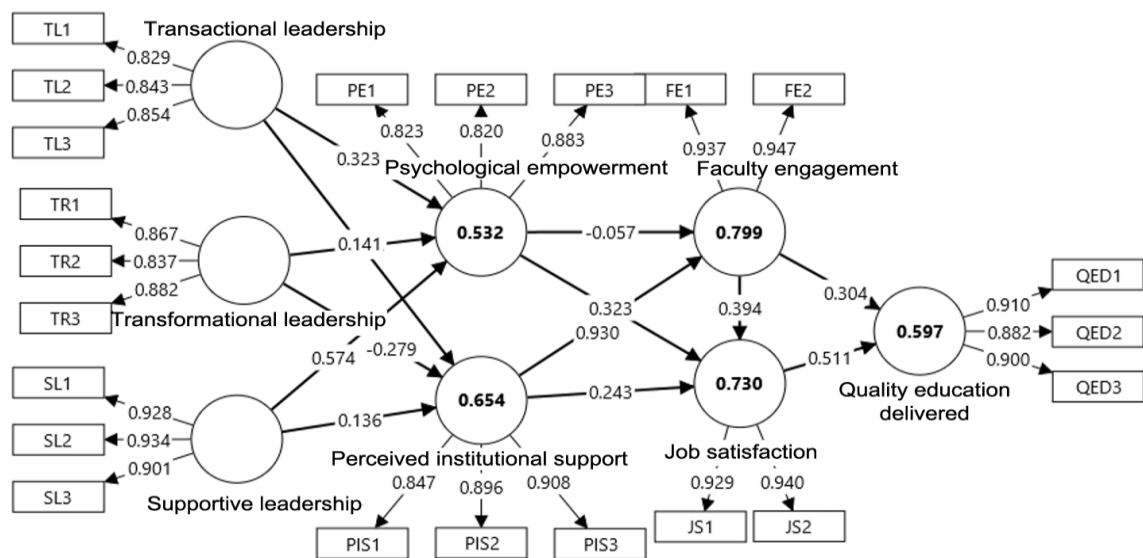


Figure 2. Measurement model.

Table 1. Construct reliability and validity

Constructs	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Faculty engagement	0.874	0.878	0.941	0.888
Job satisfaction	0.856	0.860	0.933	0.874
Perceived institutional support	0.860	0.865	0.915	0.782
Psychological empowerment	0.805	0.880	0.880	0.710
Quality education delivered	0.879	0.879	0.925	0.805
Supportive leadership	0.911	0.920	0.944	0.849
Transactional leadership	0.827	0.831	0.897	0.743
Transformational leadership	0.795	0.796	0.880	0.709

4.3. Data Analysis and Interpretation

Among the several factors measured in the study, faculty engagement, job satisfaction, perceived institutional support, psychological empowerment, quality education delivered, supportive leadership, transactional leadership, and transformational leadership—strong validity and dependability abound. Cronbach's alpha scores for all structures over the recommended threshold of 0.7 show strong internal consistency with the highest dependability recorded for supportive leadership (0.911) and the lowest for transformational leadership (0.795). Moreover, substantially over 0.7 are composite reliability measures (ρ_a and ρ_c), therefore confirming the structural dependability. Good convergent validity is shown by all construct's average variance extracted (AVE) values above 0.5. This shows that every construct essentially reflects the variance in its corresponding indicator with AVE values ranging from 0.709 (transformational leadership) to 0.888 (faculty engagement). These findings generally confirm the strength of the measuring model, therefore guaranteeing the validity and consistency of the constructions in this research as shown in [Table 1](#) and [Figure 2](#).

Table 2. Discriminant validity

Constructs	Faculty engagement	Job satisfaction	Perceived institutional support	Psychological empowerment	Quality education delivered	Supportive leadership	Transactional leadership	Transformational leadership
Faculty engagement	0.942							
Job satisfaction	0.787	0.935						
Perceived institutional support	0.893	0.804	0.884					
Psychological empowerment	0.543	0.694	0.646	0.842				
Quality education delivered	0.706	0.750	0.668	0.585	0.897			
Supportive leadership	0.777	0.751	0.753	0.614	0.681	0.921		
Transactional leadership	0.757	0.742	0.795	0.709	0.689	0.868	0.862	
Transformational leadership	0.694	0.670	0.675	0.609	0.663	0.844	0.730	0.842

The discriminant validity results demonstrate that every construct in the study is unique and measures a different concept using the Fornell-Larcker criterion. As the table shows that the square root of the average variance extracted (AVE) for every construct surpasses its correlations with other constructs. Strong discriminant validity is shown by faculty engagement with a square root of AVE of 0.942, greater than its correlations with other constructs. Similarly, job satisfaction (0.935), perceived institutional support (0.484), psychological empowerment (0.842), quality education delivered (0.897), supportive leadership (0.921), transactional leadership (0.862), transformational leadership (0.842) all show square roots of AVE that are greater than their correlations with other constructions. This guarantees that the constructions clearly differ from one another and thereby sufficiently reflect several facets of the study model. The findings demonstrate that every construct is unique and well-differentiated throughout the research, therefore validating the strength of the measuring approach as shown in Table 2.

Table 3. Collinearity statistics – VIF

Items	VIF
FE1	2.511
FE2	2.511
JS1	2.268
JS2	2.268
PE1	1.971
PE2	1.842
PE3	1.566
PIS1	1.906
PIS2	2.337
PIS3	2.617
QED1	2.764
QED2	2.175
QED3	2.518
SL1	3.313
SL2	3.306
SL3	2.771
TL1	1.630
TL2	1.697
TL3	1.744
TR1	2.140
TR2	1.636
TR3	2.123

Table 3 illustrates the Variance Inflation Factor (VIF) measures the collinearity statistics show that in this study, multicollinearity is not a problem. From 1.566 to 3.313, all VIF values are much below the 5 thresholds. Items connected to supportive leadership (SL) show the greatest VIF values. SL1 and SL2 have VIF values of 3.313 and 3.306 respectively but within reasonable ranges. Furthermore, displaying modest VIF levels are items connected to quality education delivered (QED), including QED1 (2.764) and QED3 (2.518). On the other hand, transformational leadership (TL) components had the lowest VIF values, therefore suggesting quite minimal multicollinearity. Further proving the absence of multicollinearity, other constructions including faculty engagement (FE), job satisfaction (JS), psychological empowerment (PE), perceived institutional support (PIS), and transactional leadership (TR) also show VIF values within the allowed range. This absence of multicollinearity improves the validity and robustness of the results of the study and guarantees the dependability of the regression coefficients.

Table 4. Model fit indices for saturated and estimated models

Model fit	Saturated model	Estimated model
SRMR	0.082	0.096
d_ULS	1.714	2.326
d_G	1.881	1.975
Chi-square	3555.180	3611.372
NFI	0.634	0.629

Though there are significant variations across the models, the model fit indices shown in the table show that both the estimated and saturated models offer a generally reasonable match to the data. Both the estimated model and the saturated model have Standardized Root Mean Square Residual (SRMR) values of 0.096 and 0.082, respectively, both below the criterion of 0.10, implying a fair match; the saturated model performs rather better. The d_ULS and d_G values—which gauge the difference between the observed and estimated covariance matrices are lower for the saturated model (1. Courtney and 1.881, respectively) than for the estimated model (2. 326 and 1.975 suggesting a better match for the saturated model. These variations are not significant. Hence, the generated model still sufficiently fits the data. Typically, in large samples, the chi-square values for both models (3555.180 for the saturated model and 3611.372 for the estimated model) are rather high; yet, the little rise in the estimated model reflects a somewhat less optimum match. Indicating modest fit, the Normed Fit Index (NFI) values for the estimated model are 0.629 and for the saturated model, they are 0.634. Although the saturated model shows a somewhat better fit, both models might gain from greater improvement to raise these indices—especially the NFI to obtain a more ideal model fit as shown in [Table 4](#).

[Table 5](#) indicates the R-square and adjusted R-square values offer information on the degree of model explanation for the variance in every dependent variable. Faculty engagement displays the greatest R-square value at 0.799, meaning almost 80% of the variance in faculty involvement is explained by the model with a minimum reduction to 0.798 when corrected for the number of predictors. With an R-square of 0.73, job satisfaction follows with 73% of its variance explained. The adjusted R-square of 0.728 validates the great explanatory ability of the model. Perceived institutional support shows that the model reasonably explains a large amount of its variance with an adjusted score of 0.651 and an R-square of 0.654. Psychological empowerment and superior learning with R-square values of 0.532 and 0.597 respectively and minor changes to 0.528 and 0.595 delivered demonstrate little explanatory power. The absence of R-square values for transformational leadership, transactional leadership, and supportive leadership points to these constructs either as independent variables or as yet unevaluated for their explanatory power. The model shows general excellent explanatory power, especially for faculty engagement and job satisfaction, indicating a dependable and well-fitting model with modified R-square values nearly matching the unadjusted values.

Table 5. R-square and f-square matrix

Constructs	f-square matrix						
	R-square	R-square adjusted	Faculty engagement	Job satisfaction	Perceived institutional support	Psychological empowerment	Quality education delivered
Faculty engagement	0.799	0.798		0.116			0.087
Job satisfaction	0.73	0.728					0.247
Perceived institutional support	0.654	0.651	2.507	0.036			
Psychological empowerment	0.532	0.528	0.009	0.224			
Quality education delivered	0.597	0.595					
Supportive leadership					0.008	0.025	
Transactional leadership					0.236	0.27	
Transformational leadership					0.017	0.064	

The f-square values expose the degree of mutual influence among several elements in the research. Job satisfaction (0.116) and quality education delivered (0.087) have a modest impact from faculty engagement. With a score of 0.247, job satisfaction clearly has a major influence on the quality of the delivered education. Perceived institutional support has a significant impact on faculty engagement (2.506) but only a minor effect on job satisfaction (0.36). Psychological empowerment has a modest impact on job satisfaction (0.224) but a small one on faculty engagement (0.009). Supportive leadership hardly affects psychological empowerment (0.025) and perceived institutional support (0.008). By contrast, transactional leadership has a major impact on psychological empowerment (0.270) and perceived institutional support (0.236). Transformational leadership has a lesser effect on psychological empowerment (0.064) and perceived institutional support (0.017). These values emphasize elements which have the most important influence in the model and assist us in comprehending the different strengths of these interactions.

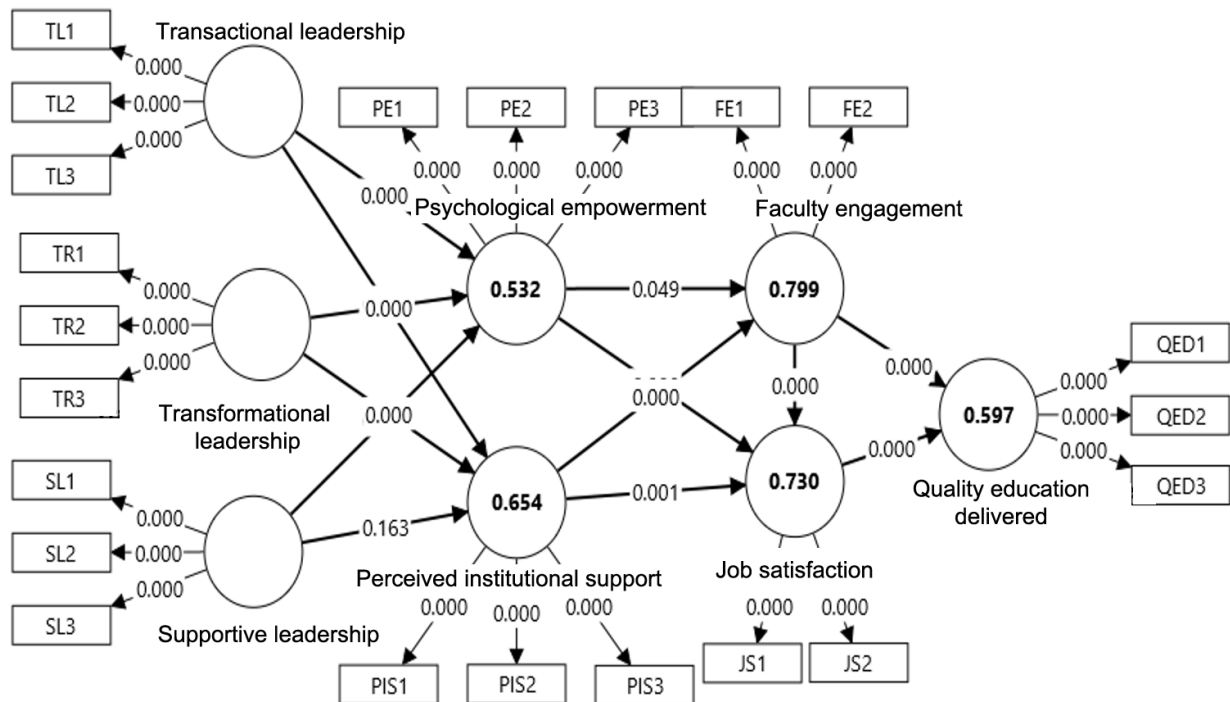


Figure 3. Structural model

Table 6. Hypothesis testing

Hypothesis	Path	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics ($ O/STDEV $)	P values	Remarks
H-D1	Transformational leadership -> quality education delivered	0.128	0.129	0.049	2.591	0.010	Accept
H-D2	Transactional leadership -> quality education delivered	0.438	0.437	0.038	11.572	0.000	Accept
H-D3	Supportive leadership -> quality education delivered	0.043	0.043	0.058	0.728	0.467	Reject
H-M1	Transformational leadership -> psychological empowerment -> faculty engagement -> job satisfaction -> quality education delivered	0.202	0.198	0.036	5.581	0.000	Accept
H-M2	Transformational leadership -> perceived institutional support -> job satisfaction -> quality education delivered	0.017	0.018	0.012	1.476	0.14	Reject
H-M3	Transactional leadership -> psychological empowerment -> faculty engagement -> job satisfaction -> quality education delivered	-0.008	-0.008	0.005	1.82	0.069	Reject
H-M4	Transactional leadership -> perceived institutional support -> faculty engagement -> job satisfaction -> quality education delivered	0.108	0.105	0.022	4.932	0.000	Accept
H-M5	Supportive leadership -> perceived institutional support -> faculty engagement -> job satisfaction -> quality education delivered	0.025	0.025	0.019	1.361	0.174	Reject
H-M6	Supportive leadership -> psychological empowerment -> faculty engagement -> job satisfaction -> quality education delivered	0.003	0.003	0.002	1.957	0.05	Reject

Results for several hypotheses investigating the relationships between leadership styles and educational outcomes including direct and mediated effects are shown in [Table 6](#).

H-D1: Transformational leadership suggests that it significantly and positively influences the quality of education delivered (0.128 and $p = 0.010$), therefore helping to substantially raise the standard of education.

Transactional leadership (H-D2) clearly and significantly affects the quality of education delivered (0.438 and $p = 0.000$). This shows that improving the quality of education is much influenced by transactional leadership.

H-D3: Supportive leadership has no appreciable impact on the quality of education delivered (0.043 and $p = 0.467$), therefore it does not greatly affect the quality of education.

H-M1: Transformational leadership (0.202 and $p = 0.000$) has an indirect impact on quality of education delivered using psychological empowerment, faculty engagement, and job satisfaction. This shows how indirectly transformative leadership improves quality education through these middle-ground factors.

H-M2: Transformational leadership's mediation effect the quality of education delivered through perceived institutional support and job satisfaction (0.017 and $p = 0.14$), therefore this pathway does not improve the quality of education.

H-M3: Transactional leadership's mediation effect the quality of education delivered through psychological empowerment, faculty engagement, and job satisfaction (-0.008 and $p = 0.069$), suggesting that this indirect pathway has little influence.

Transactional leadership has a positive impact on quality education provided through perceived institutional support, faculty engagement, and job satisfaction (0.108 and $p = 0.000$). This significant discovery highlights the effectiveness of transactional leadership in enhancing educational outcomes through the use of these mediators.

H-M5: Supportive leadership's mediation effect the quality of education delivered through perceived institutional support, faculty engagement, and job satisfaction (0.025 and $p = 0.174$), thereby implying that this pathway does not significantly influence the quality of education.

H-M6: Supportive leadership indirectly affects the quality of education delivered through psychological empowerment, faculty engagement, and job satisfaction (0.003 and $p = 0.05$), indicating that this mediating effect is slightly significant and does not affect quality education (see [Figure 3](#)).

Table 7. Importance-performance map (quality education delivered)

Constructs	Quality education delivered	Performance
Faculty engagement	0.505	48.355
Job satisfaction	0.511	50.787
Perceived institutional support	0.594	49.993
Psychological empowerment	0.136	53.297
Supportive leadership	0.043	52.467
Transactional leadership	0.438	52.938
Transformational leadership	0.128	47.898

[Table 7](#) offers an understanding of the relevance and performance of several elements influencing the delivery of quality education. Perceived institutional support ranks highest in importance and is therefore both vital and performs well with a score of 0.594 and a performance score of 49.993. Job satisfaction and faculty engagement also demonstrate great relevance with ratings of 0.511 and 0.506 respectively. Their performance scores of 50.787 and 48.355 indicate that they are successful in improving the educational quality ([Hakami, Al-Shargabi, Sabri, & Khan, 2023](#)). By comparison, psychological empowerment (0.136) and transformational leadership (0.128) have lower relevance scores and their performance scores are rather lower at 53.297 and 47.898, respectively. Supportive leadership was shown to have little effect on the quality of education with a performance score of 52.467 and a lowest importance score of 0.043. Transactional leadership is somewhat important (0.438), suggesting its

relevance but not as vital as institutional support or work satisfaction with a performance score of 52.938. While psychological empowerment and transformational leadership help considerably with quality education, the analysis emphasizes that perceived institutional support, job satisfaction, and faculty engagement are crucial elements of great importance and reasonable performance.

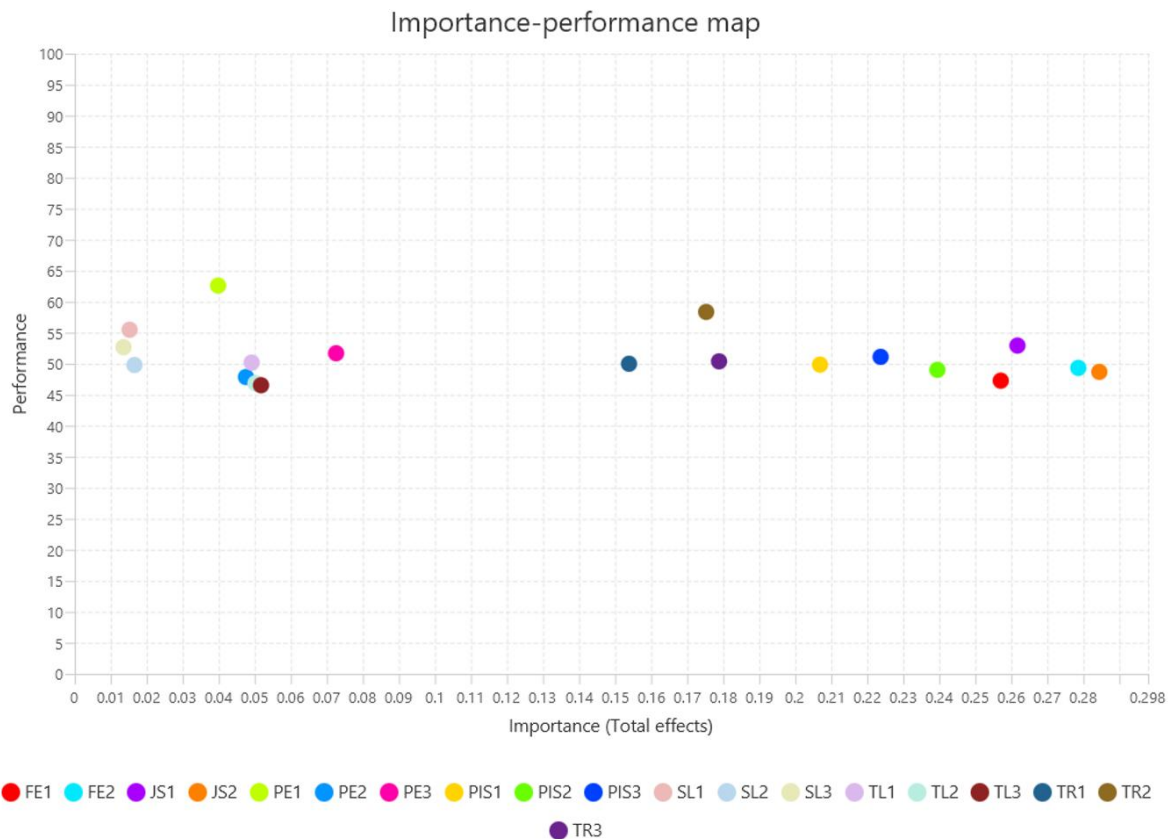


Figure 4. Importance-performance map

5. DISCUSSION

Within the framework of SDG 4, which seeks to guarantee inclusive and fair quality education and advance lifelong learning possibilities for all, the findings of the importance performance map analysis (IMPA) offer insightful analysis of how various leadership approaches affect educational results (see Figure 4).

With an IMPA score of 0.128, transformational leadership has a somewhat favorable impact on the quality of the delivered education. This leadership style promotes a good learning atmosphere and propels creative ideas for encouraging and motivating teachers. Still, its influence is quite less than that of other elements.

With an IMPA value of 0.438, transactional leadership has a higher impact on educational quality. The emphasis of this strategy on well-defined expectations and rewards fits very nicely with reaching particular performance goals and educational objectives (Wilkinson & Downton, 1974). Transactional leaders enhance SDG 4's emphasis on quantifiable educational outcomes by defining specific targets and offering incentives, therefore helping to preserve high standards in educational environments.

With an IMPA value of 0.043, supportive leadership has a smaller direct impact on educational quality. Still, it's important to provide a supportive environment that raises staff morale and satisfaction, therefore indirectly supporting improved educational results (Hebert, 2019; Uman et al., 2024). This reflects SDG 4 by creating a supportive environment for teachers.

Reflected by an IMPA value of 0.136, psychological empowerment greatly affects the quality of education. Encouragement of teachers by confidence and autonomy increases their effectiveness and engagement (Meng &

Han, 2014). This helps to achieve the objective of SDG 4— establishing a classroom where teachers are engaged and driven.

With an IMPA value of 0.594, perceived institutional support (PIS) is rather important for improving educational quality. This great value emphasizes the need for institutional support in offering resources and building a favorable atmosphere for teaching and learning (Dinc, Gürbüz, & Hacıoğlu, 2022; Mwesigwa, Tusiime, & Ssekiziyivu, 2020). A supportive institution guarantees that teachers have the resources and encouragement they need to succeed, therefore complementing SDG 4.

The IMPA findings show that although transformational leadership is crucial for inspiring and motivating teachers, transactional leadership and perceived institutional support have a more immediate and significant effect on raising educational quality. Though to different degrees, psychological empowerment and supportive leadership also have major roles. These results highlight the requirement of a balanced leadership style in education that fits the dedication of SDG 4 to high-quality, inclusive education (see Annexure I).

6. CONCLUSION

The results of this study emphasize how much faculty involvement and job satisfaction depend on leadership approaches. Transformational leadership increases faculty motivation through encouraging an environment of creativity and invention. Although more regimented and reward-based, transparent and stable transactional leadership helps faculty performance to be better. Psychological empowerment depends on supportive leadership, which also encourages institutional commitment and professional development.

Key mediators in the relationship between leadership-engagement-satisfaction were revealed to be perceived institutional support and psychological empowerment. Faculty members who believe their institution supports them show more involvement, satisfaction with their jobs, and dedication to academic success. Transformational leadership has a long-term effect on faculty involvement and improves performance right away.

The findings underline the requirement of a well-balanced leadership style in educational institutions. University officials have to combine transformational, transactional, and supportive leadership aspects to establish a whole atmosphere that supports faculty well-being and improves educational quality. Institutions giving teacher satisfaction top priority are more likely to experience long-term academic achievement.

6.1. Future Direction of Research

Although this study offers insightful analysis of how academic leadership affects faculty involvement and job satisfaction, numerous more areas of research are required. Future studies may look at how institutional success and teacher retention are long-term consequences of leadership styles. Deeper understanding of how faculty motivation changes with time might come from longitudinal research on leadership styles.

Furthermore, qualitative research techniques like case studies and interviews might enhance the quantitative results by giving better knowledge of faculty experiences and leadership dynamics. Comparative studies conducted in several educational environments and cultural settings would also help to highlight how differently leadership effectiveness differs throughout organizations and areas.

As technology changes higher education, future studies might examine how digital tools and virtual leadership affect teacher involvement and job satisfaction. Faculty involvement and leadership development programs should also be studied to improve academic leadership and success tactics.

6.2. Implication of the Study

This research can help policymakers and academics. Institutions should start transformative leadership development programs while maintaining transactional elements. Professional development and mentoring enhance teacher engagement and work satisfaction. Institutional initiatives should focus on boosting purported institutional

support. Universities should foster open communication, recognize faculty accomplishments, and offer necessary resources. Giving psychological empowerment a priority would help to ensure faculty members' autonomy and support enabling them to innovate in their preferred methods. This study emphasizes the need for good leadership in advancing SDG 4. Academic institutions may increase the general quality of education, minimize turnover rates, and improve teacher participation by establishing a nice environment. Future research on the long-term effects of leadership styles on teacher retention and student performance should serve to improve the global discussion on educational quality.

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Annexure I. Importance performance map analysis.

Code	Items	Quality education delivered	MV performance
FE ₁	To what extent do you feel engaged in your work activities at the institution?	0.257	47.274
FE ₂	How often do you actively participate in academic and administrative activities beyond your regular duties?	0.279	49.333
JS ₁	How satisfied are you with your overall job at the institution?	0.262	52.933
JS ₂	To what extent do you feel that your contributions are valued by the institution?	0.285	48.695
PE ₁	How much autonomy do you feel you have in making decisions related to your work?	0.04	62.598
PE ₂	To what extent do you feel confident in your ability to handle challenging tasks at work?	0.048	47.861
PE ₃	How often do you experience a sense of control over your work environment?	0.073	51.697
PIS ₁	How adequately does the institution provide resources and support for your professional development?	0.207	49.864
PIS ₂	To what extent does the institution support you in achieving a work-life balance?	0.24	49.021
PIS ₃	How often do you receive recognition for your contributions and achievements from the institution?	0.224	51.11
SL ₁	To what extent do you feel supported by your leadership in your professional development?	0.015	55.483
SL ₂	How effectively does your leadership provide guidance and feedback on your work performance?	0.017	49.799
SL ₃	How often does your leadership show genuine concern for your well-being?	0.014	52.676
TL ₁	How clearly do you understand the expectations and rewards associated with your performance?	0.049	50.196
TL ₂	To what extent does your leadership provide specific rewards for meeting performance targets?	0.05	46.867
TL ₃	How frequently do you receive feedback on your performance from your leadership?	0.052	46.54
TR ₁	To what extent does your leadership inspire you to exceed your usual performance?	0.154	50
TR ₂	How often does your leadership encourage innovative thinking and problem-solving?	0.176	58.355
TR ₃	How effectively does your leadership communicate a clear vision and goals for the institution?	0.179	50.392

Annexure II. Source response.

University	Participants
Jazan University	320
Arab Open University	221
Majmaah University	150
Saudi Electronic University	127
King Abdulaziz University	172

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