INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN BUSINESS & SOCIAL SCIENCES

Vol 15, Issue 5, (2025) E-ISSN: 2222-6990

Optimising Leadership Performance in Open Online Flexible Distance Learning Higher Education Institutions Amidst the Digital Transformation

Zahir Osman*, Ahmad Izanee Awang, Thirumeni Subramaniam

Open University Malaysia

Email: izanee@oum.edu.my, thirumeni@oum.edu.my

*Corresponding Author Email: zahir_osman@oum.edu.my

To Link this Article: http://dx.doi.org/10.6007/IJARBSS/v15-i5/25136 DOI:10.6007/IJARBSS/v15-i5/25136

Published Date: 14 May 2025

Abstract

The importance of leadership performance in open online distance learning cannot be overstated, as effective leadership is crucial for driving institutional success, fostering a positive learning environment, and ensuring the delivery of high-quality education to students in a rapidly evolving digital landscape. This study assesses the direct and indirect relationships between a leader's engagement, leadership style, and adaptability with a leader's performance and self-efficacy as a mediator in open online distance learning higher education institutions. Methodologically, the study comprehensively evaluates the impact of leaders' engagement, leadership style, adaptability, and performance, with leaders' self-efficacy as a mediator, through primary data collection via surveys. The survey questionnaires were distributed via email using purposive sampling, yielding a satisfactory response rate. Out of 472 surveys distributed, 361 were collected, and 342 clean data and were used in the analysis. Structural equation modeling (SEM) was employed for data analysis, utilizing Smartpls4 software. The results revealed that all the hypotheses are supported except for the direct relationship between a leader's engagement and a leader's performance, which is not supported. The findings contribute theoretically by aligning with Social Cognitive Theory (SCT), emphasizing the importance of self-efficacy beliefs and observational learning in shaping leadership behaviors and outcomes. Practically, the study suggests investment in leadership development programs, promotion of collaborative leadership practices, and support for adaptive leadership approaches to enhance leader effectiveness. Future studies could explore contextual factors, longitudinal effects, and comparative analyses to advance our understanding of leadership in online learning environments. Additionally, qualitative methods and interdisciplinary approaches could provide deeper insights into the complex dynamics of leadership in open online distance learning higher education institutions.

Keywords: Leader's Engagement, Leadership Style, Adaptability, Leader's Self-Efficacy, Leader's Performance

Introduction

Leaders are crucial to organizational success in the global landscape of open online distance learning higher education institutions. The unique context of online education demands that leaders to possess a diverse skill set to navigate the dynamic environment effectively (Djourova et al., 2020). Their performance encompasses traditional success metrics alongside innovation, adaptability, and the ability to foster a conducive virtual learning environment (Gumah et al., 2021). This multifaceted approach is essential for ensuring the institution's relevance, competitiveness, and ability to meet the evolving needs of students and stakeholders in the digital age (Ahmed et al., 2022). In addition to their multifaceted role, open online distance learning institution leaders must also navigate cross-cultural dynamics, technological advancements, and evolving pedagogical trends (Agustina et al., 2020). They must foster collaboration among geographically dispersed teams and leverage emerging technologies to enhance teaching and learning experiences (Park & Kim, 2023). This adaptive leadership approach is crucial for staying abreast of industry trends and maintaining organizational agility in a rapidly changing educational landscape (Asghar et al., 2022). In a Malaysian context, the role of leaders in open online distance learning institutions takes on additional nuances shaped by the cultural and institutional landscape of the country (Wong et al., 2020). Malaysia's commitment to expanding access to education through online platforms underscores the significance of effective leadership in ensuring the quality and relevance of education delivery (Zainal et al., 2021). Leaders in Malaysian institutions face specific challenges related to cultural diversity, technological infrastructure, and policy frameworks that require tailored leadership approaches to navigate successfully (Ang et al., 2022). Despite the growing importance of open online distance learning in Malaysia, leaders face significant challenges in these institutions (Ambad et al., 2021). These include faculty and staff engagement, student retention, technological integration, and alignment with national educational objectives (Zeeshan et al., 2021). Effectively addressing these challenges demands a nuanced understanding of the factors influencing leaders' performance in open online distance learning higher education (Ahmad et al., 2024). The proposed study holds significant implications for various stakeholders. Policymakers stand to benefit from insights that can inform the development of effective leadership frameworks and policies tailored to the unique needs of open online distance learning institutions (Intaratat et al., 2024). For the institutions themselves, the study offers valuable insights into enhancing leadership effectiveness, thereby improving organizational outcomes and student experiences. Moreover, employees and students can benefit from improved leadership practices that foster a supportive and enriching learning environment, ultimately contributing to the overall success and sustainability of online distance learning higher education institutions in Malaysia. This study aims to assess the direct and indirect relationship of a leader's engagement, leadership style, and adaptability with a leader's performance and self-efficacy as a mediator in open online distance learning higher education institutions.

Literature Review

Underpinning Theory

Social Cognitive Theory (SCT), proposed by Albert Bandura (1986), offers a robust framework to underpin the study of the direct and indirect relationship between a leader's engagement,

leadership style, and adaptability with a leader's performance, mediated by self-efficacy, in open online distance learning higher education institutions. Firstly, SCT posits that personal, environmental, and behavioral factors influence individuals' behaviors. In the context of leadership in online education, leaders' engagement, leadership style, and adaptability represent personal factors shaped by the dynamic environment of open online distance learning institutions. Secondly, SCT emphasizes the role of observational learning, suggesting that individuals learn by observing others. In the context of leadership, leaders may model effective engagement strategies, leadership styles, and adaptability behaviors, influencing the behavior and performance of their teams. Moreover, SCT underscores the importance of self-regulation and self-efficacy, the belief in one's capabilities to execute courses of action required to attain specific goals. A leader's self-efficacy beliefs influence their engagement, leadership approach, and ability to adapt to changing circumstances in online education settings. Higher levels of self-efficacy are likely to lead to greater engagement, more effective leadership behaviors, and better performance outcomes. Additionally, SCT acknowledges the reciprocal interaction between personal and environmental factors. Leaders' behaviors and performance are not only influenced by their attributes but also by the organizational context and the support structures available within the institution (Kebah et al., 2019). SCT provides a comprehensive theoretical framework for understanding the complex interplay between leaders' engagement, leadership style, adaptability, self-efficacy, and performance in open online distance learning higher education institutions, offering insights into mechanisms of influence and potential areas for intervention and improvement.

Relationship between Leader's Engagement, Leader's Self-Efficacy & Leader's Performance

The relationship between a leader's engagement, self-efficacy, and performance is pivotal in understanding effective leadership dynamics within organizations (Perez, 2021). Leader engagement refers to the extent to which leaders are emotionally invested, enthusiastic, and committed to their roles and responsibilities (Klahn & Male, 2022). Engaged leaders demonstrate passion, energy, and a sense of purpose, which can positively influence team morale and organizational outcomes (Rabiul et al., 2022). Leader self-efficacy, grounded in Albert Bandura's Social Cognitive Theory, represents a leader's belief in their ability to accomplish tasks and achieve desired outcomes (Kebah et al., 2019). Leaders with high self-efficacy are likelier to set ambitious goals, persist in facing challenges, and exhibit confidence in their decision-making abilities (Gümüş & Bellibas, 2020). The relationship between leader engagement and self-efficacy is reciprocal and reinforcing. Engaged leaders are more likely to perceive themselves as capable, leading to higher levels of self-efficacy. Conversely, leaders with high self-efficacy are more likely to feel engaged in their roles as they believe in their ability to make a meaningful impact (Wazir et al., 2020). This synergy between engagement and self-efficacy directly impacts a leader's performance. Engaged leaders with high self-efficacy are likelier to inspire and motivate their teams, foster a positive work environment, and achieve organizational objectives (Djourova et al., 2020). Their confidence, enthusiasm, and purpose drive superior performance outcomes, contributing to overall organizational success (Polatcan, 2023). Thus, the following hypotheses were proposed for this study:

H1: There is a relationship between a leader's engagement and a leader's performance in open online distance learning higher education institutions.

H2: There is a relationship between a leader's engagement and a leader's self-efficacy in open online distance learning higher education institutions.

H3: There is a mediating effect of a leader's self-efficacy on the relationship between a leader's engagement and a leader's performance in open online distance learning higher education institutions.

Relationship between Leadership Style, Leader's Self-Efficacy, Leader's Performance

The relationship between a leader's style, self-efficacy, and performance is crucial to understanding effective organizational leadership dynamics (Ambad et al., 2021). Leadership style encompasses a leader's approach to guide, motivate, and influence their team members (Ali et al., 2021). Different styles, such as autocratic, democratic, transformational, or laissez-faire, can impact team dynamics and performance outcomes (Li et al., 2020). Leader self-efficacy represents a leader's belief in their ability to accomplish tasks and achieve desired outcomes (Mohamad & Osman, 2025). Leaders with high self-efficacy tend to set ambitious goals, persist in facing challenges, and exhibit confidence in their decision-making abilities (Waseem et al., 2023). The relationship between leader style and self-efficacy is complex and can vary depending on the leadership approach adopted. For example, leaders who employ a transformational or participative style may cultivate higher levels of self-efficacy among their team members by empowering them and involving them in decision-making processes (Balbuena et al., 2020). This interplay between leader style and self-efficacy directly influences a leader's performance (Osman et al., 2018). Leaders who align their leadership style with their self-efficacy levels are better positioned to inspire and motivate their teams, foster a positive work environment, and achieve organizational objectives (Sarwar et al., 2022). Leaders can effectively leverage their confidence and leadership approach to drive superior performance outcomes and contribute to overall organizational success (Al-Mariah et al., 2021). Hence, the following hypotheses were proposed for this study:

H4: There is a relationship between a leadership style and a leader's performance in open online distance learning higher education institutions.

H5: There is a relationship between a leadership style and a leader's self-efficacy in open online distance learning higher education institutions.

H6: There is a mediating effect of a leader's self-efficacy on the relationship between a leadership style and a leader's performance in open online distance learning higher education institutions.

Relationship between Adaptability, Leader's Self-Efficacy & Leader's Performance

The relationship between adaptability, a leader's self-efficacy, and performance is multifaceted and dynamic, influenced by various internal and external factors. Adaptability is effectively adjusting to new circumstances, challenges, and environments (Aldhaheri, 2021). Leaders who demonstrate high levels of adaptability can navigate unpredictable situations, embrace change, and innovate in response to evolving needs (Nguyen et al., 2025). A leader's self-efficacy, as proposed by Albert Bandura's Social Cognitive Theory, is their belief in their ability to accomplish tasks and achieve desired outcomes. Leaders with high self-efficacy are likelier to set challenging goals, persevere in facing obstacles, and demonstrate resilience (Narenji et al., 2022). The relationship between adaptability and a leader's self-efficacy is symbiotic. As leaders successfully adapt to new challenges and situations, their confidence in their ability to handle future challenges increases, bolstering their self-efficacy (Syakur et al., 2020). Conversely, high self-efficacy enables leaders to approach new challenges with optimism and confidence, facilitating adaptability. A leader's performance is intricately linked

to adaptability and self-efficacy (Yokus, 2022). Leaders who are adaptable and possess high self-efficacy are more likely to inspire and motivate their teams, make effective decisions, and achieve organizational goals (Alzghoul et al., 2023). Their ability to navigate uncertainty, innovate, and persevere in facing challenges contributes to enhanced overall performance and organizational success (Gkintoni et al., 2023). Therefore, the following hypotheses were proposed for this study:

H7: There is a relationship between adaptability and a leader's performance in open online distance-learning higher education institutions.

H8: There is a relationship between adaptability and a leader's self-efficacy in open online distance learning higher education institutions.

H9: There is a mediating effect of a leader's self-efficacy on the relationship between adaptability and a leader's performance in open online distance learning higher education institutions.

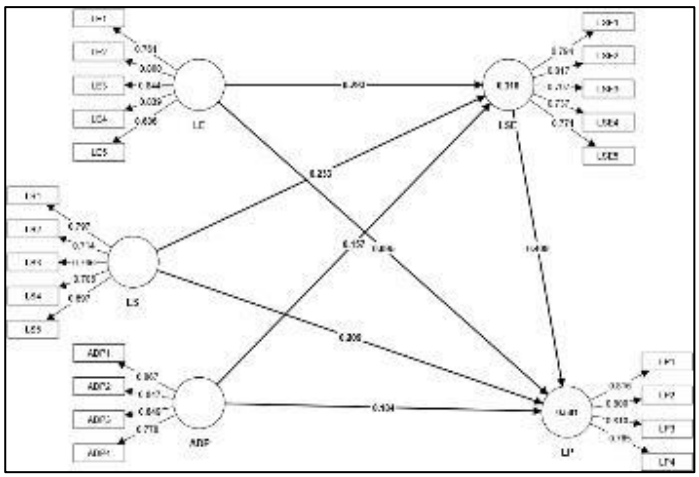

Figure 1: Research Framework
Note: LE=Leaders' Engagement LS=Leadership Style ADP=Adaptability LSE=Leader's Self-Efficacy LP=Leadership Performance

Methodology

This study aimed to comprehensively evaluate the direct and indirect impact of leaders' engagement, leadership style, adaptability, and performance, with leaders' self-efficacy as a mediator, in open online distance learning higher education institutions. To achieve this objective, researchers surveyed to gather primary data, meticulously selecting reliable and valid measurements by thoroughly examining previous research. The survey questionnaires were emailed to selected participants, employing purposive sampling due to the absence of a comprehensive population list. A total of 23 observed variables were scrutinized, incorporating exogenous variables such as leaders' engagement, adapted from Shuck et al. (2017) (5 items); leadership style, adapted from Madlock (2008) (5 items); and adaptability, adapted from Martin et al. (2012) (4 items). The study's mediating factor was leaders' self-efficacy, drawn from Bobbio & Manganelli (2009) (5 items), while the dependent variable was leaders' performance, sourced from Bratton & Gold (2017) (4 items). Respondents assessed elements within each construct using a Likert scale with five response options ranging from strongly disagree to strongly agree. Out of 472 surveys distributed, 361 were collected, yielding a satisfactory response rate of 76.5%, conducive for employing structural equation

modeling (SEM) in data analysis. Of the collected surveys, 342 were deemed clean and suitable for analysis. Researchers selected Smartpls4 software, known for its proficiency in structural equation modeling (SEM) techniques, for data analysis and hypothesis testing. This choice was influenced by the software's robust assessment capabilities and expertise in managing multivariate data analysis, aligning with the study's objectives and adhering to the recommendations of Ringle et al. (2022). Smartpls4 facilitated a meticulous evaluation of the proposed hypotheses and conducted extensive multivariate data analysis, enabling a comprehensive assessment of measurement and structural models.

Data Analysis

Respondents' Profile

Below are the profiles of the respondents for this study:

Table 1
Respondents' Profiles

		Frequency	Per cent
Gender	Male	205	59.9
	Female	137	40.1
Age	<30 Years Old	26	7.6
	31-40 Years Old	79	23.1
	41-50 Years Old	139	40.6
	51-60 Years Old	68	19.9
	>60 Years Old	30	8.8
Year of Service	<5 Years	18	5.3
	6-10 Years	43	12.6
	11-15 Years	103	30.1
	16-20 Years	103	30.1
	21-25 Years	44	12.9
	26-30 Years	15	4.4
	>30 Years	16	4.7
Position	Academician	196	57.3
	Non-Academician	146	42.7
	Total	342	100.0

Common Method Bias

Kock (2015) and Kock & Lynn (2012) pioneered an inclusive methodology, termed the collinearity test, which tackles both vertical and horizontal collinearity aspects. Diagnosing pathological collinearity hinges on variance inflation factors (VIFs) surpassing 3.3, signifying a significant concern for common method bias within the model (Kock & Lynn, 2012). Consequently, if the VIFs derived from the comprehensive collinearity assessment fall below 3.3, it can be inferred that the model remains unaffected by common method bias (Kock, 2015). As depicted in Table 1, the VIFs resulting from the overall collinearity assessment were discovered to be below 3.3, affirming the absence of any common method bias issue within the model.

Table 2
Full Collinearity Test

	LP	LE	LS	ADP	LSE
LP		1.948	1.874	1.860	1.592
LE	1.887		1.463	1.881	1.836
LS	1.878	1.514		1.943	1.951
ADP	1.251	1.306	1.303		1.315
LSE	1.439	1.713	1.759	1.767	

Measurement Model

In this investigation, we embraced the methodology Hair et al. (2017) advocated to evaluate each measurement in the first and second order, facilitating the identification of items with loadings below the 0.7 threshold. The analyses of construct reliability and validity revealed that the Average Variance Extracted (AVE) for all constructs ranged from 0.543 to 0.699, surpassing the 0.5 benchmark, thereby indicating well-established convergent validity (Hair et al., 2017) (Table 3). Furthermore, the composite reliability for all constructs exceeded 0.7, falling within the range of 0.791 to 0.857. Additionally, Cronbach's alpha values for all constructs were more significant than 0.7, varying from 0.790 to 0.856 (Table 3). To ensure discriminant validity, the initial step involved the evaluation of cross-loadings, ensuring appropriate representation and measurement of respective constructs (Table 3). Subsequently, the Heterotrait-Monotrait (HTMT) ratio was employed for further assessment, adhering to the recommended criterion for examining discriminant validity in Variance-Based Structural Equation Modeling (VB-SEM) (Henseler et al., 2015). Table 4 presents the HTMT ratios, original sample, and 95% confidence intervals, affirming compliance with the HTMT threshold of 0.85.

Table 3
Constructs' Reliability and Validity & Cross Loadings

Constructs	Items	Loadings	CA	CR	AVE
Adaptability	ADP1	0.867	0.856	0.857	0.699
	ADP2	0.847			
	ADP3	0.849			
	ADP4	0.778			
Leaders'	LE1	0.761	0.846	0.852	0.679
Engagement	LE2	0.800			
	LE3	0.844			
	LE4	0.839			
	LE5	0.686			
Leaders'	LP1	0.816	0.810	0.815	0.637
Performance	LP2	0.800			
	LP3	0.810			
	LP4	0.765			
Leadership	LS1	0.797	0.790	0.791	0.543
Style	LS2	0.714			
	LS3	0.766			
	LS4	0.706			
	LS5	0.697			

Leaders'	LSE1	0.794	0.843	0.846	0.614
Self-Efficacy	LSE2	0.817			
	LSE3	0.797			
	LSE4	0.737			
	LSE5	0.771			

Note: CA=Cronbach Alpha CR=Composite Reliability AVE=Average variance Extracted

Table 4
Hetrotrait-Monotrait (HTMT) Ratios

	ADP	LE	LP	LS
LE	0.435			
LP	0.535	0.592		
LS	0.470	0.787	0.665	
LSE	0.420	0.580	0.749	0.584

Structural Model

In this study, the evaluation of the structural model adhered to the methodology delineated by Hair et al. (2017), entailing an in-depth scrutiny of pathway coefficients (β) and coefficients of determination (R^2). To achieve this, the Partial Least Squares (PLS) method was employed, leveraging 5000 sub-samples to ascertain the significance level of path coefficients. The results from hypothesis testing for confidence intervals, encompassing path coefficients (beta), corresponding t-statistics, and p-values, are meticulously presented in Table 5. This rigorous examination offers invaluable insights into the significance and robustness of the relationships among the variables within the structural model. The comprehensive hypotheses testing results furnished in Table 5 furnish a nuanced analysis of each hypothesis, accentuating Beta coefficients, T-statistics, P-values, and the ultimate decisions concerning hypothesis support, thus enhancing the depth and clarity of the study's findings.

For *Hypothesis 1*, the hypothesis posits that there is a direct relationship between leaders' engagement and their performance in open online distance learning higher education institutions. However, this hypothesis is rejected, as indicated by the non-significant p-value of 0.146, despite a positive beta coefficient of 0.095 and a t-statistic of 1.455. This suggests that leaders' engagement does not significantly impact their performance in this context. For *Hypothesis 2*, this hypothesis suggests a direct relationship between leaders' engagement and their self-efficacy. The hypothesis is accepted with a low p-value of 0.000, a positive beta coefficient of 0.293, and a t-statistic of 4.574, indicating a statistically significant relationship. Thus, engaged leaders are more likely to possess higher levels of self-efficacy, contributing to their overall effectiveness. For *Hypothesis 3*, this hypothesis proposes an indirect relationship between leaders' engagement, their self-efficacy, and their performance. The hypothesis is accepted with a low p-value of 0.000, a positive beta coefficient of 0.120, and a t-statistic of 3.706, indicating a significant relationship. This suggests that leaders' engagement indirectly influences their performance through its impact on self-efficacy. *Hypothesis 4* suggests a direct relationship between leadership style and leaders' performance. This hypothesis is accepted with a low p-value of 0.001, a positive beta coefficient of 0.209, and a t-statistic of 3.312, indicating a significant relationship. Thus, leadership style significantly impacts leaders' performance outcomes. *Hypothesis 5* posits a direct relationship between leadership style and leaders' self-efficacy. The hypothesis is accepted with a low p-value of 0.000, a positive

beta coefficient of 0.233, and a t-statistic of 3.927, indicating a significant relationship. Thus, leadership style influences leaders' self-efficacy levels. *Hypothesis 6* suggests an indirect relationship between leadership style, leaders' self-efficacy, and leaders' performance. The hypothesis is accepted with a low p-value of 0.000, a positive beta coefficient of 0.095, and a t-statistic of 3.799, indicating a significant relationship. This indicates that leadership style indirectly influences performance through its impact on self-efficacy. *Hypothesis 7* proposes a direct relationship between adaptability and leaders' performance. The hypothesis is accepted with a low p-value of 0.000, a positive beta coefficient of 0.184, and a t-statistic of 3.605, indicating a significant relationship. Thus, adaptability significantly impacts leaders' performance outcomes. *Hypothesis 8* suggests a direct relationship between adaptability and leaders' self-efficacy. The hypothesis is accepted with a low p-value of 0.002, a positive beta coefficient of 0.157, and a t-statistic of 3.174, indicating a significant relationship. Thus, adaptability influences leaders' self-efficacy levels. *Hypothesis 9* posits a direct relationship between leaders' self-efficacy and their performance. The hypothesis is accepted with a low p-value of 0.000, a positive beta coefficient of 0.409, and a t-statistic of 8.344, indicating a significant relationship. Thus, leaders' self-efficacy significantly impacts their performance outcomes. *Hypothesis 10* suggests an indirect relationship between adaptability, leaders' self-efficacy, and performance. The hypothesis is accepted with a low p-value of 0.003, a positive beta coefficient of 0.064, and a t-statistic of 2.928, indicating a significant relationship. Thus, adaptability indirectly influences leaders' performance through its impact on self-efficacy.

Table 5 provides a comprehensive summary of effect sizes (f^2), evaluated independently of sample size, according to Cohen's criteria (1992): small (0.020 to 0.150), medium (0.150 to 0.350), or significant (0.350 or greater). The observed effect sizes ranged from small (0.009) to large (0.229). Intrinsic Value Inflation Factor (VIF) values, as outlined in Table 5, remained below the more lenient threshold of 5, with the highest value recorded at 1.939. This level of collinearity facilitates meaningful comparisons of sizes and interpretation of coefficients within the structural model. A noteworthy degree of explained variance for the endogenous construct is apparent, with an R^2 value of 0.501 (Figure 1). Regarding the mediator, the model explained approximately 31.8% of the variance in the structure, as indicated by an R^2 value of 0.318.

The model's inference and managerial recommendations were evaluated through out-of-sample predictive analysis employing the PLSpredict method (Shmueli et al., 2016, 2019). Table 6 illustrates that PLS-SEM generated superior Q2 predictions (>0) in contrast to naive mean predictions, consistently exhibiting lower RMSE values than linear model (LM) benchmarks, thus underscoring its predictive prowess. Furthermore, the RMSE values for PLS-SEM predictions consistently outperformed those of the linear model (LM) prediction benchmark in eight out of nine instances, emphasizing the predictive strength of the proposed model as delineated in Table 6. The introduction of the Cross-Validated Predictive Ability Test (CVPAT) by Hair et al. (2022) and its integration with PLSpredict analysis by Liengaard et al. (2021) are noteworthy. Table 7 reaffirms the superior predictive capabilities of PLS-SEM, with lower average loss values compared to indicator averages and LM benchmarks, providing further evidence of its enhanced predictive performance.

Ringle and Sarstedt (2016), along with Hair et al. (2018), introduced Importance Performance Map Analysis (IPMA) to evaluate the significance and effectiveness of latent variables in

explaining acceptance, as elaborated in Table 8. The overall impact on performance was most pronounced for leader self-efficacy (0.409), followed by leadership style (0.305), adaptability (0.248), and leader engagement (0.215), highlighting their relative importance in performance. Adaptability scored the highest (66.583), while leader self-efficacy scored the lowest (60.503) on a 0-100 scale, indicating better performance for adaptability and lower achievement for leader self-efficacy. Despite ranking first in leader performance importance, leader self-efficacy displayed the lowest performance. These findings suggest prioritizing strategies to enhance leader self-efficacy among leaders, potentially improving the overall performance of leaders in open online distance learning higher education institutions.

Table 5
Hypotheses Testing Results, Effect Sizes (f^2) & Variance Inflation Factor (VIF)

Hypotheses	Beta	T-statistics	P-values	f^2	VIF	2.50%	97.50%	Decision
H1: LE -> LP	0.095	1.455	0.146	0.009	1.939	-0.032	0.220	***Rejected***
H2: LE -> LSE	0.293	4.574	0.000	0.070	1.813	0.165	0.417	*Accepted*
H3: LE -> LSE -> LP	0.120	3.706	0.000			0.062	0.188	*Accepted*
H4: LS -> LP	0.209	3.312	0.001	0.046	1.910	0.080	0.331	*Accepted*
H5: LS -> LSE	0.233	3.927	0.000	0.043	1.831	0.108	0.344	*Accepted*
H6: LS -> LSE -> LP	0.095	3.799	0.000			0.046	0.146	*Accepted*
H7: ADP -> LP	0.184	3.605	0.000	0.054	1.255	0.081	0.282	*Accepted*
H8: ADP -> LSE	0.157	3.174	0.002	0.030	1.219	0.060	0.254	*Accepted*
H9: LSE -> LP	0.409	8.344	0.000	0.229	1.466	0.311	0.504	*Accepted*
H10: ADP -> LSE -> LP	0.064	2.928	0.003			0.026	0.111	*Accepted*

Table 6
PLSpredict

Items	Q^2predict	PLS-RMSE	LM-RMSE	PLS-LM
LP1	0.300	0.607	0.610	-0.003
LP2	0.226	0.608	0.616	-0.008
LP3	0.241	0.669	0.683	-0.014
LP4	0.158	0.714	0.720	-0.006
LSE1	0.234	0.619	0.620	-0.001
LSE2	0.194	0.623	0.635	-0.012
LSE3	0.139	0.672	0.671	0.001
LSE4	0.155	0.680	0.696	-0.016
LSE5	0.191	0.613	0.628	-0.015

Table 7
Cross-Validated Predictive Ability Test (CVPAT)

	Average loss difference	t value	p-value
LP	-0.126	6.023	0.000
LSE	-0.091	4.669	0.000
Overall	-0.107	6.067	0.000

Table 8
Importance-Performance Map Analysis (IPMA)

Constructs	Total Effect	Performance
ADP	0.248	66.583
LE	0.215	66.340
LS	0.305	65.537
LSE	0.409	60.503

Discussion

In open online distance learning higher education institutions, enhancing a leader's engagement, leadership style, and adaptability can significantly improve leader performance, with leader self-efficacy as a mediator. Fostering leader engagement involves promoting open communication channels, establishing clear goals, and providing opportunities for meaningful participation in decision-making processes. Encouraging leaders to actively connect with their teams, students, and stakeholders through regular interactions, feedback sessions, and collaborative initiatives can enhance their sense of belonging and commitment, consequently boosting their performance. Developing an effective leadership style entails understanding the needs and preferences of diverse individuals and adapting leadership approaches accordingly. Leaders can undergo training programs or workshops to refine their leadership skills, such as transformational, servant, or situational leadership, aligning their style with the unique demands of online distance learning environments. Flexibility and responsiveness to evolving circumstances are essential traits for leaders to navigate the complexities of digital education effectively. Promoting adaptability among leaders involves cultivating a growth mindset and providing continuous learning and skill development opportunities. Leaders should be encouraged to embrace change, experiment with new technologies and pedagogical approaches, and adapt strategies based on emerging trends and feedback. Building resilience and agility enables leaders to effectively navigate uncertainties and challenges inherent in online learning environments, ultimately enhancing their performance outcomes.

Leader self-efficacy is crucial in translating these strategies into tangible performance outcomes. By instilling confidence in their abilities to lead and navigate the dynamic landscape of online education effectively, leaders are more likely to exhibit proactive behaviors, exert more significant effort, and persist in the face of challenges. Therefore, interventions to enhance leader self-efficacy, such as mentoring, coaching, and reflective practices, can amplify the impact of engagement, leadership style, and adaptability on leader performance in open online distance learning higher education institutions.

Theoretical Implications

The findings of this study carry profound theoretical implications within the framework of Social Cognitive Theory (SCT) as proposed by Albert Bandura (1986). SCT emphasizes the interplay between individuals' behaviors, cognitive processes, and environmental factors, suggesting that these elements interact reciprocally to shape human functioning and achievement. In leadership within open online distance learning higher education institutions, the observed relationships among leader engagement, leadership style, adaptability, and leader performance align with SCT principles. Bandura's theory posits that individuals' beliefs in their capabilities, known as self-efficacy, significantly influence their motivation, behaviors,

and, ultimately, their performance outcomes. The mediation of leader self-efficacy in the relationship between engagement, leadership style, adaptability, and leader performance underscores the pivotal role of self-efficacy beliefs in guiding leadership behaviors and outcomes. Furthermore, SCT highlights the importance of observational learning and social modeling in shaping individuals' beliefs and behaviors. Leaders who witness successful engagement strategies, effective leadership styles, and adaptive behaviors in their peers or role models will likely internalize these experiences and develop stronger self-efficacy beliefs. Consequently, interventions promoting positive leadership behaviors and creating supportive learning environments can have profound implications for enhancing leader self-efficacy and subsequent performance. Moreover, the findings contribute to our understanding of how environmental factors, such as the context of open online distance learning, influence leadership dynamics and self-efficacy beliefs. SCT emphasizes the role of environmental influences, including social, cultural, and organizational factors, in shaping individuals' beliefs and behaviors. Thus, future research could explore additional contextual variables within online learning environments and their impact on leadership efficacy beliefs and performance outcomes, further advancing our understanding of leadership within this evolving educational landscape.

Practical Implications

The findings of this study offer valuable practical implications for open online distance learning higher education institutions seeking to enhance leadership effectiveness and performance outcomes. Institutions should prioritize investment in leadership development programs that enhance leader engagement, refine leadership styles, and foster adaptability in online learning environments. Providing leaders with training opportunities and resources tailored to the unique demands of online education can equip them with the necessary skills and competencies to navigate challenges effectively. Institutions should also encourage leaders to adopt collaborative and engaging leadership practices that facilitate active communication, collaboration, and participation among students, faculty, and staff. Leaders can leverage digital tools and platforms to create inclusive learning environments that promote interaction and knowledge sharing. Moreover, institutions should support leaders in embracing adaptive leadership approaches that enable them to respond flexibly to changing circumstances and emerging trends in online education. Leaders should be encouraged to experiment with innovative pedagogical strategies, technologies, and instructional designs to meet the evolving needs of learners. Recognizing the importance of leader self-efficacy in driving performance outcomes, institutions should provide support mechanisms to enhance leaders' confidence and belief in their capabilities. Offering mentorship, coaching, and peer support networks can help leaders build resilience and self-assurance in their roles. Additionally, institutions should establish mechanisms for continuous monitoring and evaluation of leadership effectiveness and performance outcomes in online learning environments. Regular feedback, assessments, and performance reviews can help identify areas for improvement and inform targeted interventions to optimize leadership practices. By implementing these practical strategies, open online distance learning higher education institutions can cultivate effective leadership practices, enhance leader performance, and ultimately improve the quality of online education delivery and student outcomes.

Suggestions for Future Study

Future studies in this domain could explore several avenues to advance our understanding of leadership in open online distance-learning higher education institutions. Firstly, researchers could delve deeper into how leader engagement, leadership style, and adaptability influence leader performance, focusing on the moderating effects of contextual factors such as organizational culture, technological infrastructure, and student demographics. Additionally, longitudinal studies could assess the long-term impact of leadership development interventions on leader self-efficacy and performance outcomes over time. Furthermore, comparative studies could examine leadership practices and effectiveness variations across online learning environments (e.g., synchronous vs. asynchronous, blended learning models) and institutional contexts (e.g., public vs. private, significant vs. small institutions). Moreover, qualitative research methods such as interviews, focus groups, and case studies could be employed to gain deeper insights into the lived experiences of leaders in online education and elucidate the complex interplay between leadership behaviors, self-efficacy beliefs, and performance outcomes. Lastly, interdisciplinary approaches that draw on insights from organizational psychology, educational technology, and instructional design could offer valuable perspectives on optimizing leadership practices and supporting the effective delivery of online education in higher education institutions.

Conclusion

This study underscores the importance of leader engagement, leadership style, and adaptability in open online distance-learning higher education institutions. Leader self-efficacy emerges as a critical mediator, influencing performance outcomes. Practical implications highlight the need to invest in leadership development programs, promote collaborative leadership practices, and recognize leader self-efficacy. Future research should explore contextual factors, longitudinal effects, and comparative analyses further to enhance our understanding of leadership in online education. Ultimately, optimizing leadership practices can improve the quality of online education delivery and student outcomes in higher education institutions.

References

Agustina, R., Kamdi, W., Hadi, S., & Nurhadi, D. (2020). Influence of the Principal's Digital Leadership on the Reflective Practices of Vocational Teachers Mediated by Trust, Self-efficacy, and Work Engagement. International Journal of Learning, Teaching and Educational Research, 19(11), 24-40.

Ahmad, R., Ngah, A. H., & Mohamed, A. M. (2024). Examining the Linkage betweenTransformational leadership styles and succession planning programs in Malaysian public universities. International Journal of Public Administration, 47(3), 172-185.

Ahmed, T., Chaojun, Y., Hongjuan, Y., & Mahmood, S. (2022). The impact of empowering Leadership on job performance of higher education institution employees: the mediating role of goal clarity and self-efficacy. Psychology Research and Behavior Management, 677-694.

Aldhaheri, A. (2021, February). Measuring school leaders' adaptability in the UAE: Development of a scale to measure leadership adaptability. In Evidence-based HRM: a Global Forum for Empirical Scholarship (Vol. 9, No. 1, pp. 34-46). Emerald Publishing Limited.

Ali, M. H., Irfan, M., & Zafar, S. (2021). Effect of leadership styles on education quality in public universities with the interaction of organizational politics: using the partial least square algorithm. Journal of Social Sciences and Humanities, 1(2), 1-13.

Al-maaitah, D. A., Alsoud, M., & Al-maaitah, T. A. (2021). The role of leadership styles on staffs job satisfaction in public organizations. The journal of contemporary issues in business and government, 27(1), 772-783.

Alzghoul, A., Algraibeh, K. M., Khawaldeh, K., Khaddam, A. A., & Al-Kasasbeh, O. (2023). Nexus of strategic thinking, knowledge-oriented leadership, and employee creativity in higher education institutes. International Journal of Professional Business Review, 8(4), e01107-e01107.

Ambad, S. N. A., Kalimin, K. M., Ag Damit, D. H. D., & Andrew, J. V. (2021). The mediating effect of psychological empowerment on leadership styles and task performance of academic staff. Leadership & Organization Development Journal, 42(5), 763-782.

Ang, H. S., Heng, S. T., Lee, S. Y., & Sing, X. X. (2022). Impacts of employee engagement, self-efficacy, self-esteem, and organisational citizenship behaviour on job performance of academic staff in University Tunku Abdul Rahman (UTAR) during the covid-19 pandemic (Doctoral dissertation, UTAR).

Asghar, F., Mahmood, S., Iqbal Khan, K., Gohar Qureshi, M., & Fakhri, M. (2022). Eminence of leader humility for follower creativity during COVID-19: the role of self-efficacy and proactive personality. Frontiers in Psychology, 12, 790517.

Balbuena, S. E., Perez, J. E. M., Irudayaselvam, S., & Balaccua, M. M. (2020). Application of Leadership Theories in Analyzing the Effects of Leadership Styles on Productivity in Philippine Higher Education Institutions. Online Submission, 8(3), 53-62.

Bandura, A. (1986). Social foundations of thought and action: A social cognitive theory. Prentice-Hall, Inc.

Bobbio, A., & Manganelli, A. M. (2009). Leadership self-efficacy scale: A new multidimensional instrument. TPM-Testing, Psychometrics, Methodology in Applied Psychology, 16(1), 3-24

Bratton, J., & Gold, J. (2017). Human resource management: theory and practice. London, UK:Palgrave Macmillan.

Cohen, J. (1992). A power primer. Psychological Bulletin, 112, 155–159. doi:10.1037/0033-2909.112.1.155

Djourova, N. P., Rodríguez Molina, I., Tordera Santamatilde, N., & Abate, G. (2020). Self-efficacy and resilience: mediating mechanisms in the relationship between the transformational leadership dimensions and well-being. Journal of Leadership & Organizational Studies, 27(3), 256-270.

Djourova, N. P., Rodríguez Molina, I., Tordera Santamatilde, N., & Abate, G. (2020). Self-efficacy and resilience: mediating mechanisms in the relationship between the transformational leadership dimensions and well-being. Journal of Leadership & Organizational Studies, 27(3), 256-270.

Gkintoni, E., Halkiopoulos, C., & Antonopoulou, H. (2022). Neuroleadership an asset in educational settings: An overview. Emerging Science Journal. Emerging Science Journal, 6(4), 893-904.

Gumah, B., Wenbin, L., & Aziabah, M. A. (2021). Supervisors' leadership styles' influence on foreign teachers' self-efficacy in a cross-cultural work setting: A moderated mediation analysis. Sage Open, 11(1), 2158244021994546.

Gümüş, S., & Bellibaş, M. Ş. (2020). The relationship between professional development and school principals' leadership practices: the mediating role of self-efficacy. International Journal of Educational Management, 34(7), 1155-1170.

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2017). A primer on partial leastsquares structural equation modeling (PLS-SEM) (2nd ed.). Thousand Oaks, CA: SAGE.

Hair, J. F., M. Sarstedt, C.M. Ringle, and S.P. Gudergan. (2018). Advanced issues in partial least squares structural equation modeling. Thousand Oakes, CA: Sage Publications

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2022). A Primer on Partial LeastSquares Structural Equation Modeling (PLS-SEM) (3 ed.). Thousand Oaks, CA: Sage.

Henseler, J., Ringle, C. M., and Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling, Journal of the Academy of Marketing Science, 43(1): 115-135.

Intaratat, K., Osman, Z., Nguyen, H. A. T., Suhandoko, A. D. J., & Sultana, N. (2024). Peer and tutor interaction effects on collaborative learning: The role of learning self-efficacy. Edelweiss Applied Science and Technology, 8(4), 2108-2121.

Kebah, M., Raju, V., & Osman, Z. (2019). Growth of online purchase in Saudi Arabia retail industry. International Journal of Recent Technology and Engineering, 8(3), 869-872.. ISSN: 2277-3878

Kebah, M., Raju, V., & Osman, Z. (2019). Online purchasing trend in the retail industry in Saudi. International Journal of Recent Technology and Engineering (IJRTE), 8(3), 865-868. ISSN: 2277-3878

Klahn Acuña, B., & Male, T. (2022). Toxic leadership and academics' work engagement in higher education: A cross-sectional study from Chile. Educational Management Administration & Leadership, 17411432221084474.

Kock, N., & Lynn, G.S. (2012). Lateral collinearity and misleading results in variance-based SEM: An illustration and recommendations. Journal of the Association for Information Systems, 13(7), 546-580.

Kock, N. (2015). Common method bias in PLS-SEM: A full collinearity assessment approach. International Journal of e-Collaboration, 11(4), 1-10.

Li, X. T., Rahman, A., Connie, G., & Osman, Z. (2020). Examining customers' perception of electronic shopping mall's e-service quality. International Journal of Services, Economics and Management, 11(4), 329-346.

Liengaard, B. D., Sharma, P. N., Hult, G. T. M., Jensen, M. B., Sarstedt, M., Hair, J. F., & Ringle, C. M. (2021). Prediction: Coveted, Yet Forsaken? Introducing a Cross-validated Predictive Ability Test in Partial Least Squares Path Modeling. Decision Sciences, 52(2), 362-392.

Madlock, P. E. (2008). The Link Between Leadership Style, Communicator Competence, and Employee Satisfaction. The Journal of Business Communication (1973), 45(1), 61–78.

Martin, A. J., Nejad, H., Colmar, S., & Liem, G. A. D. (2012). Adaptability: Conceptual and empirical perspectives on responses to change, novelty and uncertainty. Australian Journal of Guidance and Counselling, 22, 58 – 81. doi:10.1017/jgc.2012.8

Mohamad, L., & Osman, Z. (2025). INTENTION TO ADOPT INNOVATION CULTURE AMONG EMPLOYEES IN ONLINE DISTANCE LEARNING HIGHER EDUCATION INSTITUTIONS. Turkish Online Journal of Distance Education, 26(1), 122-133. ISSN: 1302-6488

Narenji Thani, F., Mazari, E., Asadi, S., & Mashayekhikhi, M. (2022). The impact of self-development on the tendency toward organizational innovation in higher education institutions with the mediating role of human resource agility. Journal of Applied Research in Higher Education, 14(2), 852-873.

Nguyen, H.A.T., Osman, Z., Serrano, J., Suhandoko, A.D.J. & Intaratat, K. (2025) Determinants of environmental awareness toward the green living behaviour of students: the role of family, university and social environmental factors in Hanoi, Vietnam. Environmental & Socio-economic Studies, 2025, Sciendo, vol. 13 no. 1, pp. 1-14. https://doi.org/10.2478/environ-2025-0001

Osman, Z., Mohamad, W., Mohamad, R. K., Mohamad, L., & Sulaiman, T. F. T. (2018). Enhancing students' academic performance in Malaysian online distance learning institutions. Asia Pacific Journal of Educators and Education, 33, 19-28.

Park, H. J., & Kim, S. (2023). Relationship between super-leadership and self-directed learning ability in online nursing education: The mediating effects of self-leadership and self-efficacy perceptions. Heliyon, 9(6).

Perez, L. D. (2021). Leadership Creativity and Its Impact on Employee Engagement and Creativity (Doctoral dissertation, The Chicago School of Professional Psychology).

Polatcan, M. (2023). The influence of leadership self-efficacy on college students' leadership practice: The mediating role of motivation to lead. International Journal of Educational Leadership and Management, 11(2), 138-166.

Rabiul, M. K., Patwary, A. K., & Panha, I. M. (2022). The role of servant leadership, self-efficacy, high performance work systems, and work engagement in increasing service-oriented behavior. Journal of Hospitality Marketing & Management, 31(4), 504-526.

Ringle, C.M., and M. Sarstedt. (2016). Gain more insight from your PLS-SEM results: The importance-performance map analysis. Industrial Management & Data Systems. 116: 1865–1886.

Ringle, Christian M., Wende, Sven, & Becker, Jan-Michael. (2022). SmartPLS 4. Oststeinbek:SmartPLS. Retrieved from https://www.smartpls.com

Sarwar, U., Tariq, R., & Yong, Q. Z. (2022). Principals' leadership styles and its impact on teachers' performance at college level. Frontiers in Psychology, 13, 919693.

Shuck, B., Adelson, J. L., & Reio, T. G. (2017). The Employee Engagement Scale: Initial evidence for construct validity and implications for theory and practice. Human Resource Management, (56)6, 953-977. doi:10.1002/hrm.21811

Shmueli, G., S. Ray, J.M. Velasquez Estrada, and S.B. Chatla. (2016). The elephant in the room: predictive performance of PLS models. Journal of Business Research, 69: 4552–4564.

Shmueli, G., M. Sarstedt, J.F. Hair, J.-H. Cheah, H. Ting, S. Vaithilingam, and C.M. Ringle. (2019). Predictive model assessment in PLS-SEM: Guidelines for using PLSpredict. European Journal of Marketing. 53: 2322–2347.

Syakur, A., Susilo, T. A. B., Wike, W., & Ahmadi, R. (2020). Sustainability of communication, organizational culture, cooperation, trust and leadership style for lecturer commitments in higher education. Budapest International Research and Critics Institute (BIRCI-Journal): Humanities and Social Sciences, 3(2), 1325-1335.

Waseem, S. N., Warraich, U. A., & Azhar, T. (2023). Battling Gender Leadership Link: The Relationship Between Leadership Styles, and Performance Predictors in the Context of Higher Education Sector. Journal of Entrepreneurship, Management, and Innovation, 5(1), 95-121.

Wazir, A. M. S. B., Amaamari, Q. A., & Hasan, B. A. (2020). The Relationships Between Self-Efficacy, Managerial Competency and Learning Orientation on Job Performance Among Leaders in Saudi Universities. International Journal of Intellectual Human Resource Management (IJIHRM), 1(01), 12-20.

Wong, C. X. Y., Kong, I. J. C., Lai, C. W., Lai, S. K., & Ong, X. Y. (2020). The roles of personal resources and transformational leadership on work engagement and its impact on job performance among the academic staff (Doctoral dissertation, UTAR).

Yokuş, G. (2022). Developing a guiding model of educational leadership in higher education during the COVID-19 pandemic: A grounded theory study. Participatory Educational Research, 9(1), 362-387.

Zainal, M. A., & Mohd Matore, M. E. E. (2021). The influence of teachers' self-efficacy and school leaders' transformational leadership practices on teachers' innovative behaviour. International journal of environmental research and public health, 18(12), 6423.

Zeeshan, S., Ng, S. I., Ho, J. A., & Jantan, A. H. (2021). Assessing the impact of servant leadership on employee engagement through the mediating role of self-efficacy in the Pakistani banking sector. Cogent Business & Management, 8(1), 1963029.