

Role of Innovations with Respect to Leaderships in Malaysian Universities

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<https://doi.org/10.62345/jads.2025.14.2.144>

Abstract

The goal of this research was to investigate the impact of product and process innovation in the Malaysian teaching sector through the lens of transformational leadership (TL) and authentic leadership (AL) qualities. The study also discusses how leadership TL and AL types change the extent of knowledge sharing (KS) in an organization. This study framework was examined in Malaysian teaching institutions. Through the use of PLS-SEM for data analysis, the results have concluded that TL and KS have a significant positive effect on sector innovations in Malaysia. Alternatively, authentic leadership did not support. Additionally, KS has been positively and significantly associated with transformational leadership, but has no moderating influence on authentic leadership. Specifically, the findings indicate that transformational leadership makes a significant contribution to both product and process innovation in Malaysian universities, whereas authentic leadership has no significant effect. Furthermore, knowledge sharing has a positive influence on innovation and moderates the relationship between transformational leadership and innovation.

Keywords: Innovations, Leadership, Malaysian Universities.

Introduction

In the teaching industry, many challenges lie, including issues such as political, technological, developmental, and non-traditional demands worldwide, thus making the teaching field an interesting area of research. With increased globalization, the teaching of industry finance systems and the changing education system's supply and demand have led many teaching institutions globally to try to survive and gain competitive benefits through innovation (Brennan, 2008; Gaspar & Mabic, 2015). The elements affecting that innovation in teaching institutions have become an essential arena of interest in organizational studies (Meek et al., 2009).

Existing literature typically indicates that profitable innovation approaches in companies are generated through the interaction between various institutional and individual aspects (Zhu, 2015). Specifically, prior studies on teaching institutions have highlighted the central significant role of TL and AL, as well as KS practices (Li et al., 2014; Von Krogh et al., 2012). Leadership can stimulate innovation within an organization by enabling educators to enhance their productive

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skills and creativity, which ultimately can improve innovation skills and competitive advantages for the business (Xue et al., 2011).

Although there are several theories about the ideal style of leadership for achieving remarkable organizational innovations, previous studies have focused on the importance of TL (Lin & Hsiao, 2014; Rawung et al., 2015). TL emphasizes collaboration, motivation, and teamwork towards their workers at various stages to ensure the required organizational change. TL brings incentives and objectives to draw their employees towards desired performance by providing personal and professional growth opportunities for their subordinates (Gumusluoglu & Ilsev, 2009).

Although the requirement for innovation causes significant organizational changes, transformational leadership is the most effective design for fostering innovation within the company (Nijstad et al., 2014). Likewise, the KS technique has a significant impact on organizational innovation (Wang & Wang, 2012). Creativity and innovation are the consequences of knowledge and information and are the primary focus of the area (Ritala et al., 2015). Consequently, information exchange and sharing between subordinates will bring creativity and innovation within the institutions.

Nonetheless, while previous research has advanced our understanding of innovation factors at universities, several significant gaps in the literature must be identified before we draw sound conclusions. Firstly, most previous research studies are restricted to TL, the most efficient style, while ignoring new styles (Al-Husseini & Elbeltagi, 2016). Currently, AL has garnered significant attention among scholars as being extremely superficial, which can bring forth desired consequences (Luthans et al., 2006). This style recommends that leaders develop their authority in an ethical, honest, and respectful manner towards their employees. Generally, authentic leadership fosters openness and trust among employees, which are crucial for creativity and innovation (Walumbwa et al., 2008).

Secondly, it is recommended that leadership is essential for employees' characteristics and for the organization where leadership qualities are practical (Gardner et al., 2011). Thirdly, previous studies have overlooked the association between leadership qualities and KS. KS exists in the form of embedded norms, which enable authentic and transformational leaders to attain innovations, strategic changes, and outcomes. In this paper, we aim to clarify the aforementioned gaps in the current literature.

Study Background and Development of Hypotheses

Innovation has been recognized as a reliable means to enhance companies' competitiveness and economic growth. Innovation is a product of several participating parties, including research and financial bodies, universities, government, regulatory firms, and the interaction and activities of these entities towards the national innovation system at the collective stage. Innovation in universities is critical to all subsystems in a country and makes a significant contribution. Universities play a crucial role in today's knowledge economy, driving development, technological application, and the dissemination of innovative knowledge (2010). The key role of universities encompasses a wide range of actions aimed at developing, transmitting, and transferring knowledge, which can be manifested in higher education innovation. Universities' innovation refers to the capability to incorporate and produce a product or process, an organizational tool, or a new or challengingly enhanced one, which significantly impacts the operations of institutions and their stakeholders, such as communities, firms, and students. Numerous universities worldwide have struggled to gain competitive advantages through innovation, including globalization, limited resources, fluctuating learning demands, and the demand and supply of

services worldwide (Gaspar & Mabic, 2015; OECD, 2009).

Since innovation is vital for the well-being of a nation and its survival, previous research has identified various factors that affect innovation in institutions, including leadership techniques and the KS (Zhu, 2015). Leadership is regarded as a significant feature of inventions, due to its role in creating ideas, setting goals, and establishing an innovative culture. During the mid-1970s, Burns introduced the notion of leadership theories to explain political leaders (Graham, 1995). Leadership was classified in two major styles: transactional (TL and transactional) (Bass & Bass Bernard, 1985). He suggests that TL primarily try to achieve goals and implement changes through the positive understanding of the consequences for subordinates. They change the conceptions, expectations, and motivation of workers towards shared objectives and anticipate further benefits for the good of the group. Transformational leaders can upgrade and extend their employees' interests. While transactional leaders usually consider how the quality and quantity of performance are marginally maintained and improved, how resistance to change is reduced, how one goal is replaced by another, and how decisions are made.

As suggested by the author Rowold (2005), the ability of TL to encourage followers is characterized by four behavioral components. The first is inspirational encouragement, referring to the leaders' efforts to express a vision that will empower employees to identify future goals and give significance to present tasks (Odumeru & Ogbonna, 2013). The inspirational and motivational leaders will enhance the self-efficacy and encouragement of their followers, as well as foster creativity. The second is idealized influence (charisma), which describes how leaders demonstrate good conduct and values, thereby recognizing followers as influential and role models in society (Gumusluoglu & Ilsev, 2009). Thirdly, intellectual stimulation refers to a leader's ability to encourage and stimulate creativity, and challenge employee assumptions by providing a framework in which they can overcome their workload (Zhou & George, 2003).

Leaders urge their followers to test and promote creativity and innovation in response to new challenges. Lastly, the fourth mechanism, known as individualized consideration, involves personal attention. This explains how a leader addresses the individual needs of his workers and serves as a guideline for each successor (Osborn & Marion, 2009). Nevertheless, the importance and significance of the TL role are improving productivity and innovation within the organization. Numerous research studies have demonstrated that organizations implementing the TL approach of leadership at various levels are more successful (i.e., at the individual, team, entity, or company level).

Moreover, TL's role in improving organizational efficiency and creativity highlights its importance and significance. Organizations that implement TL have found better results even when implemented in the presence of innovations, extra-role activities, and in-role activities. Numerous research studies have demonstrated that organizations implementing transition styles of leadership at various levels (i.e., individual, team, entity, or company) are more successful (Barrick et al., 2015). In turn, TL and its actions will create a climate of confidence that encourages innovation in the whole organization (Al-Husseini, 2014). As suggested by these authors, Alzawahreh (2011) and Vaccaro et al. (2012), TL types are capable of changing the organizational culture, encouraging product and process innovation, while improving employee creativity. Herein, we expand existing efforts through the review of TL effect on innovation within the Malaysian higher education sector and assume the following:

H1: Transformational leadership has a positive and significant impact on innovation in Malaysia's educational sector.

Ethics and performance demands necessitate a novel approach to ethical management in chaotic

work environments. Both practitioners and scholars have discussed the importance of AL. AL is described as "a pattern of leader behavior that draws upon and promotes both positive psychological capacities and a positive ethical climate, to foster greater self-awareness, an internalized moral perspective, balanced processing of information, and relational transparency on the part of leaders working with followers, fostering positive self-development" (Walumbwa et al., 2008). A study has recommended that the actions of trustworthy leaders can improve the performance of supporters in dysfunctional working environments that are sustainable (Avolio & Gardner, 2005).

AL is divided into four behavioral styles. These behaviors are balanced processing, self-awareness, relational transparency, and moral perspective. Self-awareness is described as the degree to which a leader is aware of and can control others' weaknesses and power (Walumbwa et al., 2008). Social psychologists describe authenticity as an advanced form of moral development. As recommended by Peus et al. (2012), true leaders address ethical issues and highlight them, driven by universal values and standards, as well as community needs and organizational stresses. The relational openness, which is ultimately demonstrated by our creativity, is another dimension found in AL. According to this study, intimate relationships indicate the achievement and valuation of truthfulness and openness (Avolio & Gardner, 2005). Balanced care is the final aspect of AL, representing an unbiased method of decision-making. AL's potential to increase the results of supporters, employees' empowerment, and O and B identification with organizational leaders (Leroy et al., 2012).

Authentic leadership is vital for innovation; however, a dearth of studies has explored its association with innovation, particularly in educational institutions. The Author has noted that a creative environment has aspects that enable real leaders to influence the company's innovation strategy (Černe et al., 2013). Most managers cannot understand that a good and sincere leader who encourages trust is a key to building a culture of confidence within an organization. The Author claims that true leaders transmit their vision and mission to their collaborators with importance that empowers them to develop their drive and determination for their tasks (Von Krogh et al., 2012).

According to Yaverbaum and Sherman (2008), patience and calmness are key characteristics of authentic leaders that contribute to their success in innovation. Authentic leadership leads to higher innovation among their workers. Additionally, Malik et al. (2016) state that authentic leadership plays a critical part in the innovation and creativity of their workers. The employees positively influence new ideas leading to innovation and creativity. Authentic leaders will shift workers' views to find new ideas and solutions. We therefore argue:

H2: Authentic leadership has a positive and significant impact on innovation in Malaysia's educational sector.

KS is a group of actions involving information sharing, sharing, and donation between employees and team members, which include ideas, information, and suggestions relevant to tasks (Elrehail et al., 2018). Additionally, as suggested by Wang and Wang (2012), leadership and information sharing both have a significant impact on a company's creativity. KS is a precious innovation mechanism. In general, business developments should rely heavily on the expertise, experience, and skills of employees in building value (Ritala et al., 2015). Employees must continually benefit from the knowledge of their colleagues and utilize their specific expertise within the organization to complete creative tasks (Bontis et al., 2009).

An organization that promotes the sharing of knowledge among groups, workers, and the entire organization will generate new thoughts and ideas that are beneficial for creating novel

opportunities for the business (Heffner & Sharif, 2008). The ongoing shared knowledge is an integral part of the problem-solving and learning activities within an organization and has been associated with orientations and learning, thus leading to market sensing, innovation, and improvement (Elrehail et al., 2018; Svetlik, Stavrou-Costea, & Lin, 2007). Additionally, previous studies indicate that ongoing common information within an organization, at a lower operational cost, facilitates a wide range of changes in the business and enables faster meeting of employees' requirements and demands (Vaccaro et al., 2012). It is therefore clear that the practice of KS plays an essential role in fostering innovation. Thus, we assume:

H3: KS has a positive and significant impact on Malaysia's educational sector innovation.

The exchange of information can be regarded as a direct requirement for leadership positions. Claiming that key executives can use information sharing to guide the organization (Han et al., 2016). If leaders participate in participatory decision-making in an atmosphere where knowledge exchange is the norm for an organization, they will gain more tactics, ideas, input, and insights from their team (Rawung et al., 2015). A leader has a better chance of making the correct decision and finding the best solution. TL and AL behavioral leaders can also help solve and improve if members share high levels of knowledge (Loebbecke, van Fenema, & Powell, 2016). Therefore, since sharing information is the rule in the business, an inspiring leader is more likely to be creative. So, we hypothesize that:

H4: At Malaysian universities, the relationship between TL and innovations is moderated by KS.

H5: At Malaysian universities, the relationship between AL and innovations is moderated by KS.

Methodology

The Author explores many relationships between exogenous and endogenous latent constructs in its quantitative form. We develop a structured questionnaire. To measure the suggested variables in this study, we use questionnaires. The academic staff were the primary target population for this survey, comprising all academic staff in Malaysian universities. The key to selecting university employees is that they are the primary foundation for innovations in higher educational institutions and the primary drivers of innovation. As many reports have pointed out, private HEIs are more able than public HEIs to innovate (Broek et al., 2014; Deepak, 2005; Resnick, 2012). This HEI analysis was conducted in observance of this recommendation from scientists and scholars.

According to the researchers, there are 385 academic employees in the four universities. When the respondents are significantly fewer, as past studies indicate, researchers may obtain responses from the entire population. Correspondingly, 400 questionnaires were distributed to the four universities, and 278 were returned. As per the suggestions of Hair, Ringle, and Sarstedt (2012), all incomplete answers and missing values have been omitted.

Measurement Scales

TL was measured by 20 items developed by Bass and Avolio (2002).

We measured AL using the ALQ questionnaire developed by these authors, which consists of 14 questions (Neider & Schriesheim, 2011; Walumbwa et al., 2008). The innovation construct was measured by two t: product innovation and process innovation. Wereese were measured by Daft (1978), Perrin (1993), and Škerlavaj, Song, and Lee (2010), using a total of eleven questions. KS was treated as an order construct, as it encompasses two layers, including knowledge Collection and knowledge sharing, as described by Carmeli et al. (2011), Van den Hooff and de Leeuw van Weenen (2004), and Van Den Hooff and De Ridder (2004). For each construct, items were adopted from prior research, which were used extensively.

Results

PLS-SEM was used to test hypotheses. In recent years, PLS-SEM has faced numerous scientific critiques, including a lack of quality indexes and the failure to detect measurement errors (Sarstedt et al., 2016). However, under certain conditions, it can work efficiently. PLS-SEM is the proper method for testing HOC in the proposed model (Becker et al., 2012). Where HOC stands for higher order constructs. The model works efficiently if several systemic path relationships are involved as per the constructs. Smart PLS is therefore an effective method if the proposed model is multifaceted and has moderation and mediation constructs (Alsaad, Mohamad, & Ismail, 2017). PLS-SEM is worth mentioning when the data do not follow the sample size and normality assumptions (Henseler et al., 2009).

This research, based on the above factors, employed the PLS-SEM method to analyse the data, which is more suitable for this approach than others. Lastly, the sample size in this analysis was 278. Until conducting and evaluating the path modelling, we analyse each variable included in the equation by analysing skewness and kurtosis. All values ranged from ± 0.042 . And ± 1.54 , well below the cut-off of ± 2 (Pallant, 2013). This indicates that our data was normally distributed. We have discussed how the first-order measuring model used in this analysis is accurate and valid. The item loadings and composite reliability scores used for the measurement model were satisfactory. Refer to the Table for the criteria used in the measurement model.

For discriminatory validity, AVE (fornell-lacker) for each latent variable is calculated. The statistics have also illustrated the reliability and validity of the study. It can be assumed, therefore, that all items are suitable for further research. The higher-order latent construct was then tested both in terms of reliability and validity (Wetzels et al., 2009). Because the HOC were characterized as predictive latent variables in this analysis, the scholars investigated the loading of the posited HOC on each LOC (first-order). As illustrated in Table 3, all first-order variables are loaded above the 0.70 cut-off—eventually, AVE as well over the 0.50 cut-off value.

Therefore, all latent variables of the HOC are accurate and valid. To test our hypotheses, we have developed two structural models: first, a model with a direct effect, and second, a model with a moderation (interaction) effect. Hypotheses of H1 to H3 were investigated and evaluated through the main model. The interaction model has been proposed in the meantime for studying the predictions related to H4 and H5 moderation. Such steps have been implemented according to a suggestion by previous scholars, which stresses that when the reliability and validity of the variables differ significantly from each other.

Table 1: Measurement Model Reliability and Validity

Variables	Dimension	Items	Loading	CR	AVE
Transformational leadership	Idealized influence	ID_1	0.751	0.987	0.534
		ID_2	0.795		
		ID_3	0.765		
		ID_4	0.898		
		ID_5	0.732		
	Individual consideration	IC_1	0.904	0.836	0.580
		IC_2	0.719		
		IC_3	0.729		
		IC_4	0.707		
	Inspirational motivation	IM_1	0.830	0.820	0.603
		IM_2	0.703		

		IM_3	0.706		
		IM_4	0.708		
	Intellectual stimulation	IS_1	0.870	0.986	0.503
		IS_2	0.907		
		IS_3	0.757		
		IS_4	0.904		
Authentic leadership	Relational transparency	RT_1	0.701	0.808	0.671
		RT_3	0.729		
		RT_4	0.936		
	Self-Awareness	SA_1	0.716	0.789	0.607
		SA_2	0.753		
		SA_3	0.709		
	Balanced Processing	BP_1	0.741	0.901	0.616
		BP_2	0.751		
		BP_3	0.775		
		BP_4	0.920		
	Internal Moral Perspective	IM_1	0.914	0.878	0.636
		IM_2	0.923		
		IM_3	0.807		
Information Sharing	Information collecting	IC_1	0.739	0.876	0.552
		IC_2	0.755		
		IC_3	0.847		
		IC_4	0.786		
	Information donating	ID_1	0.703	0.827	0.604
		ID_2	0.767		
		ID_3	0.756		
		ID_4	0.801		
Innovation	Product innovation	PI_1	0.705	0.806	0.570
		PI_2	0.957		
		PI_3	0.819		
		PI_4	0.986		
	Process innovation	PIN_1	0.876	0.706	0.645
		PIN_2	0.867		
		PIN_3	0.983		
		PIN_4	0.820		
		PIN_5	0.845		
		PIN_6	0.972		
		PIN_7	0.803		

Here the structural model involves a moderator. With PLS algorithm and PLS bootstrapping procedures, by using 5000 resamples. Tables 2 and 3 present the results of the calculation of the two models. Table 4 shows that a favorable and significant relationship between TL and innovation ($\beta = 0.239$; $p < 0.05$) shows that innovations will also increase as TL increases. The researcher therefore accepted Hypothesis 1. The connection was positive and insignificant in connection to the role of authentic leadership in innovations ($\beta = 0.073$; $p < 0.05$). The researchers therefore agreed not to follow Hypothesis 2 in this case, which demonstrated that Authentic Leadership does not affect innovations at the level of significance 0.05. Eventually, the study found a positive and important relationship between IS and innovation ($\beta = 0.233$; $p < 0.05$) indicates

that as KS got higher innovation will also which help acceptance of Hypothesis 3.

The outcomes of the interaction model were shown in Table 5. As shown in the table, there is a significant path coefficient of interaction between latent variable ($\beta = 0.248$, $P < 0.05$) TL with KS, which suggested a moderative effect of KS on the TL function. The researcher therefore prefers to consider H4. This will demonstrate that TL is a more effective activity in universities of Malaysia when information sharing prevails.

Table 2: Fornell and Lacker Criterion

	B_P	ID_I	I_C	I_M	IM_P	I_S	K_C	K_D	P_I	PD_I	R_T	S_W
B_P	0.864											
ID_I	0.765	0.789										
I_C	0.723	0.721	0.882									
I_M	0.663	0.654	0.553	0.846								
I_S	0.705	0.717	0.752	0.730	0.872							
IM_P	0.731	0.731	0.614	0.654	0.626	0.884						
K_D	0.460	0.448	0.378	0.571	0.512	0.398	0.815					
K_C	0.465	0.478	0.372	0.548	0.470	0.407	0.564	0.832				
P_I	0.594	0.492	0.537	0.375	0.541	0.331	0.370	0.453	0.845			
PD_I	0.473	0.455	0.440	0.263	0.472	0.304	0.346	0.409	0.720	0.822		
R_T	0.740	0.685	0.665	0.567	0.683	0.675	0.465	0.418	0.507	0.429	0.843	
S_W	0.685	0.654	0.577	0.561	0.626	0.624	0.523	0.479	0.463	0.330	0.634	0.852

Table 3: Assessment of Higher Order Constructs (HOC) measurement model

HOC	CR	AVE	First-order construct	Loadings
TL	0.837	0.536	Idealized_influence	0.841
			Individual_consideration	0.734
			Inspirational_motivation	0.843
			Intellectual_stimulation	0.813
AL	0.812	0.542	Relational_transparency	0.829
			Self-Awareness	0.811
			Balanced_processing	0.809
			Internal_moral_perspective	0.739
IS	0.903	0.503	Information_collecting	0.823
			Information_Donating	0.805
Innovation	0.813	0.612	Product_innovation	0.849
			Process_innovation	0.804

Table 4: Direct Effect

Constructs	B	SD	t-values	p-values
AL>I	0.073	0.109	1.470	0.066
KS>I	0.233	0.148	2.130	0.053
TL>I	0.239	0.170	1.861	0.057

Table 5: Moderation Effect

Constructs	B	SD	t-value	p-value
AL*KS	-0.367	0.146	1.667	0.068
TL*KS	0.248	0.180	2.341	0.021

The results indicate that AL*KS has a minor effect, suggesting that a sharing of knowledge has no moderation towards the relationship of AL ($\beta = -0.367$, at $P > 0.05$). This indicates that the exchange of information has no moderating effect on AL's position. Consequently, the researcher chooses to deny H5. Given the findings above, it was partially supported that sharing knowledge has a buffering, yet moderate, impact. In summary, the findings indicate that KS is the only direct influence of transformational leadership on innovation in the Malaysian private universities sector. Authentic leadership in Malaysian universities has no impact on innovation, which is contrary to standards. However, the results show that KS significantly correlates with TL, thus supporting the argument that sharing of information has a moderating effect.

Discussion

Our study examined the effects of process and product innovation under two types of leadership: TL and AL. The research also explored the moderating effect of sharing knowledge on the types of leadership proposed in this research. In Malaysia, our research targeted academic staff. The regression analysis was conducted on 278 valid observations. PLS-SEM was employed to test the hypotheses proposed. The findings of our key model indicate a positive correlation between TL and product innovation in universities in Malaysia. The results are consistent with past analyses of academic institutions, which have distinctly studied the position of the TL at the hierarchical level (Zhang et al., 2021). It indicates that TL and their actions will create an environment of trust that encourages innovation as a foundation for past research. Thus, the study demonstrated that TL is essential for employees to innovate and adapt to their institutions' culture, ultimately promoting product and process innovations.

This research also explored the impact of AL on two types of product and process innovation. The results obtained from the additional analysis, as opposed to the assumptions, indicate that AL does not affect academic staff innovations within Malaysia. For instance, the results do not align with previous research; yet, they demonstrate an active relationship between AL and innovations (Edú-Valsania, Moriano, & Molero, 2016). At least our two factors might clarify the contradictory findings. Firstly, authentic leadership is a relatively recent concept, poorly understood, and underutilized, which may require academics to adopt proper training and related activities for leaders (Ahmad, 2024).

Further study should investigate how training can influence leaders' ability to implement leadership styles effectively. Second, several problems have been identified in the education sector in Malaysia, and various unethical practices carried out by management and administrative officers have impaired the capacity of university employees to innovate (Hashim, 2019). Such challenges may be liable where they contribute to the unproductive existence of current AL behaviors.

Finally, we explored the direct effect of the principles of IS on innovation in our main effect model. In comparison to prior research, our exchange of information has been operationalized rather than directly assessed as a reflective system, based on knowledge donation and the compilation of standards. It was so that the research priorities would remain consistent, which is supposed to encourage innovation in academic institutions through information-sharing norms and processes, such as knowledge selection and donation. Findings show that KS in Malaysian institutions is

strongly associated with product and process innovation. Thus, the finding is consistent with previous investigations (Al Qershi et al., 2023).

Nonetheless, to test our moderate hypotheses, we analyzed the interaction model. Our results show that TL and innovations are strongly related to KS in the universities. This suggests that sharing knowledge can be viewed as a prerequisite for the TL position. Therefore, KS is a key to management being able to utilize and guide their companies in adopting innovation. In contrast, innovations and authentic leadership did not confirm a moderate position towards the sharing of knowledge. Thus, it indicates that the AL's impact on innovation is based on a leader's ability to create current processes and expectations for knowledge sharing. These findings are theoretically supported by transformational leadership theory, which explains that leaders who inspire and motivate employees foster a climate conducive to innovation. This aligns with prior studies (Afsar & Umrani, 2020) that link transformational behaviors to enhanced creativity. The insignificant result for authentic leadership may be context-specific; as previous literature suggests, ethical and transparent leadership styles may influence trust but not always directly translate into innovation in higher education settings (Boukareva, 2025).

Conclusion

The goal was to investigate the effect of TL, AL, and the moderation of KS on product and process innovations in Malaysian universities. This research, therefore, fills critical gaps. Initially, previous studies have restricted practical management style approaches to the leadership of TL. This research is among the studies that have explored the influence of AL in universities' product and process innovation within a theoretical framework, which adds new understandings about information and provides a new perspective to AL theory.

Therefore, TL differs significantly from previous research in our operationalization. Instead of conducting a separate study of behavioral variables, such as first-order variables, we analyzed TL as a higher-order variable. This enables the measurement and theorization of the idea's influence as a whole, encompassing various facets. Secondly, in a non-Western country such as Malaysia, we review our suggested structure, which varies substantively from the studies carried out in the Western context. In this regard, our understanding of management, KS, and innovation would be further established in contexts that have a different culture and are unique to Arab nations. Thirdly, previous studies indirectly note that styles of leadership promote organizational innovations by ignoring the roles played and the norms of the businesses. The position of information sharing moderates highlights those requirements that are deemed necessary when it comes to promoting the leadership's role in supporting organizational innovation. Results have established that KS provides opportunities for workers to participate in decision-making, allowing them to gain more approaches, views, feedback, ideas, and facts. If the expectation in an organization is the sharing of information, opportunities for leaders to make the right decisions and choose the best options are greater.

If team stakeholders have a high level of knowledge sharing, leaders would be more effective in addressing issues and strengthening their organization. Based on the findings of this study, we have found that AL has no effect on university innovation from a Malaysian perspective, which requires a deeper insight into the phenomenon and opens new avenues for future researchers in other countries and fields, specifically AL and innovation. In terms of practices, the present research suggests and offers several suggestions to leaders, especially those from Malaysian universities. TL practices are the proper leadership behavior to promote innovation in institutions. We also need to focus on KS and provide a climate for universities that facilitates the sharing of

knowledge between departments or at the university level in general.

Recommendations

However, as briefly mentioned in the above section, future studies should replicate various areas of the same study model to obtain similar results. Other forms of innovation, such as strategic technological and organizational advances, should also be taken into account. Additionally, future researchers and scholars can use learning organizations as mediators or moderators. It is essential to incorporate alternative mediation and moderation variables, such as confidence, trust, and training, as they have a significant influence on innovation in developing countries.

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