

Mediating Role of Innovation Capability between Knowledge Based Human Resource Management and Organisational Performance: A Case of Higher Education Institutions in Malaysia

Eugene Dcruz

Universiti Tun Abdul Razak (UNIRAZAK)

eugene_dcruz.urcc@unirazak.edu.my

Abstract

Education is widely recognized as a powerful catalyst for development and progress in the service sector. Implementing knowledge-based human resource practices (KHRM) offers significant competitive advantages for higher education institutions, particularly in underdeveloped countries. This study aims to identify how KHRM elements—recruitment and selection, compensation, empowerment, training and development, and performance appraisal—contribute to university performance, with innovation capability acting as a mediating factor. To achieve this, a quantitative research approach was adopted, utilizing a questionnaire survey conducted with 311 academic staff members from Malaysian universities. The research framework is grounded in the principles of expectancy theory. A structural equation model was applied to test the hypotheses derived from this theory. The findings reveal that four out of five KHRM elements significantly predict organizational performance: training and development, recruitment and selection, empowerment, and compensation. Among these, empowerment emerged as the strongest predictor of organizational performance. Additionally, innovation capability significantly predicts organizational performance. The results also indicate that three KHRM variables—training and development, performance appraisal, and compensation—predict organizational performance through the mediating role of innovation capability.

Keywords: : Education, Knowledge Based HRM, Innovation Capability, Organisational Performance, Expectancy Theory

1. Introduction

Service sector is the largest contributor of Malaysia gross domestic product (GDP) (Noor et al., 2020; Bamel et al., 2022) where its contribution was approximately 58.1% in 2022 and expected to increase up to 59.9% in 2030 (Department of Statistics Malaysia, 2023). Education is widely acknowledged as a powerful catalyst for growth and progress in the service sector (Cheng et al., 2022; Crawford and Cifuentes-Faura, 2022). It possesses the potential to propel a nation towards achieving advanced, high-income status in the foreseeable future. Statista (2023) predicts that Malaysia's GDP is projected to experience a moderate decline to 4.7% in 2023, compared to the 5.8% growth rate recorded in 2022.

Therefore, when economic development displays signs of slowing down, it is time to capitalize more on human capital growth. A study by Heriot-Watt University Malaysia (2022), indicates a more extensive allocation of resources to universities will play a crucial role in enabling Malaysia to progress towards its goal of becoming a high-income country. This allocation will facilitate the country's transition through both the green and digital revolutions, making a significant contribution to Malaysia's overall GDP. This demonstrates that universities in Malaysia need special consideration to attain high GDP growth. However, in global education competition, Malaysian universities are still facing problems in term of innovative capabilities (Hussen et al., 2021; Bhatti et al., 2019) and performance (Noor et al., 2022). No private or public university comes under the QS ranking of top 50 world best universities (QS Ranking, 2022) indicating the low performance of these universities and lack of innovative skills to enhance performance. Also, the universities ranking has dropped in 2023 as compared to 2022 with 72.7% of the listed universities recording a decline in ranking performance.

Notably, both private and public institutions of higher education play pivotal roles in this transformative journey, making substantial contributions to the country's GDP (Cheng et al., 2022; Azman and Abdullah, 2020). This trend is expected to drive an increased demand for KHRM practices and the cultivation of human capital within higher education institutions (Zutshi et al., 2021; Zhao and Wang, 2020). KHRM practices encourage knowledge formation, knowledge distribution, and utilization essential for boosting innovative performance of employees and organization (Singh et al., 2021; Caputo et al., 2019; Jiakui et al., 2023). However, there is limited understanding of how KHRM practices influence the theoretically acknowledged and adaptable knowledge sharing among individual staff members, ultimately impacting innovation and organizational performance (Singh et al., 2021; Jiakui et al., 2023), particularly within the context of higher education institutions.

Consequently, there is a compelling need for research to gain a profound understanding of the performance and innovation capabilities of higher education institutions. While developed nations can readily enhance their innovation capabilities and performance, the same cannot be said for emerging and developing countries, including Malaysia. Attaining such levels of performance remains a significant challenge. Thus, the implementation of KHRM practices represents valuable competitive advantages for higher education institutions in these nations. The question of which knowledge based human resource practices are more important to enhance organizational performance is debatable in literature (Jiakui et al., 2023; Wu and Gao, 2022; Caputo et al., 2019; Singh et al., 2021). Authors in past studies (e.g.,

Kang, Snell, Swart and Kinnie, 2013; Singh et al., 2021; Caputo et al., 2019; Singh et al., 2021) have recognized the integration of training & development, performance appraisal, empowerment and compensation in knowledge based human resource practices. However, there is a lack of research that specifically examines the relationship between knowledge-based human resource practices and their role as antecedents of performance. With this context in mind, this study aims to scrutinize KHRM practices, including recruitment and selection, compensation, empowerment, training and development, and performance appraisal direct and indirect relationship with organizational performance in contexts of higher education institutions. Thus, the following research objectives are discussed under this study:

1. To examine the role of knowledge based human resource practices (recruitment & selection, compensation, empowerment, training & development, and performance appraisal) in enhancing the performance of higher education institutions.
2. To examine the influence of innovation capability on performance of higher education institutions.
3. To examine the mediating role of innovation capability between knowledge based human resource aspects (recruitment & selection, compensation, empowerment, training & development, and performance appraisal) and performance of higher education institutions.

2. Literature Review

The advent of globalization and advancements in technology have intensified competition within the higher education sector on a global scale, influencing the overall performance of organizations. The evolving business landscape and increased competition have compelled organizations to prioritize enhancing their performance. Today, knowledge-based resources are increasingly seen as valuable competitive tools that contribute significantly to organizational performance. Strengthening organizational performance is paramount for any organization, as it largely depends on effective human resource management. Individuals are the architects and supporters of the entire organizational system. This heightened competition necessitates the adoption of knowledge-based human resource management (KHRM) approaches to drive innovation and improve the performance of educational institutions worldwide (Lentjushenkova, 2021; Singh et al., 2020; Wang et al., 2022; Singh et al., 2021).

In line with contemporary financial trends, Malaysia has witnessed a shift in its economic activities towards industrial development (Song et al., 2021). This shift has created a demand for a highly skilled and knowledgeable workforce in universities (Noor et al., 2022; Zain et al., 2017). The rapid growth in student enrollments and the diversification of courses across various fields in the past decade, coupled with the increased adoption of internet and web-based teaching methods, has led to an expansion of both public and private universities in Malaysia (Singh et al., 2021).

Despite efforts to improve, Malaysian universities have struggled to secure a position among the top 50 global ranking universities. Notably, the rankings of top Malaysian

universities such as Universiti Malaya and Universiti Putra Malaysia dropped to 65 and 143 in 2022 from 59 and 132 in 2021, respectively (World QS Ranking, 2023). This decline has led to a reduction in the number of international students, from 51,000 in 2021 to 40,000 in 2022 (Ministry of Higher Education Malaysia, 2023). Given these challenges, it is imperative for higher education institutions to enhance their performance to maintain competitiveness. In summary, while the demand for KHRM practices to boost organizational performance is increasing, the higher education sector in Malaysia has been slow to respond, leaving much of the market potential untapped.

The rapid developments and intense competition in the higher education sector have underscored the importance of knowledge-based human resource management (KHRM) practices for driving positive organizational performance among university academics (Noor et al., 2020; Najam et al., 2020). Previous studies have emphasized the need to assess the effectiveness of KHRM practices from the perspective of workers, considering their social and psychological impacts on academics in higher education institutions (Oluwatayo, 2015; Singh et al., 2021; Kianto et al., 2017). However, the influence of KHRM aspects on organizational performance among academics remains largely unexplored in the literature. Existing research does not provide conclusive evidence on the specific KHRM attributes that are crucial for organizational performance (Kianto et al., 2017; Noor et al., 2020; Najam et al., 2020; Singh et al., 2020). Consequently, the implementation of KHRM practices in the context of higher education is still in its early stages and requires further investigation.

Wang et al (2021) and Minbaeva et al. (2019), pointed out that to enhance performance as a knowledge-based process, managers must adapt traditional HRM practices to advance knowledge sharing and creation in the firm. However, there is a continuous debate among various researchers on knowledge based HRM attributes relevant to organization performance. Some researchers (e.g., Kianto et al., 2017; Wang et al., 2021; Singh et al., 2020) suggested compensation, training & development and empowerment are more important antecedents of organization performance while some (e.g., Inkien et al., 2015, Singh et al., 2021) used three attributes; training & development, performance appraisal, and rewards & compensation. Minbaeva (2013) and Malik et al. (2019) identified four slightly different dimensions, including empowerment, training & development, rewards, recruitment & selection being the more important variables for organizational performance. According to Bowen and Ostroff (2004) as well as Delaney and Huselid (1996), recruiting and selection, training and development, empowerment, performance evaluation, and compensation are crucial factors that have a significant influence on organizational behavior and effectiveness. These elements play a pivotal role in shaping the overall performance and outcomes of an organization. This discussion highlights the significance of recruitment and selection, compensation, performance assessment, training and development, and empowerment as the key KHRM practices under consideration in this study. These practices are recognized as crucial factors that can greatly impact organizational performance and outcomes.

Ultimately, exploring the precursors of KHRM, and their impact on organizational performance continues to be a relevant area of research within the higher education sector. Furthermore, given the important role of the higher education sector in economies around the

world, and in Malaysia in specific, it is surprising that very limited research has been conducted on the importance and antecedents of knowledge based human resource management practices in organizational performance in this sector. There have been calls for and attempts to integrate knowledge based human resource practices (Singh et al., 2021) antecedents and human capital (Wang et al., 2022; Dedahanov et al., 2017) into the performance of higher education research. Thus, this study is conducted to include the KHRM antecedents (recruitment & selection, compensation, performance assessment, training and development and empowerment) in organizational performance in contexts of higher education institutions in Malaysia to fill the existing literature gap.

Innovation capability is regarded as a key driver of growth and a crucial element in organizational performance, competitiveness, and efficiency (Noor et al., 2022). The ability to foster and promote innovation is vital for growth in both the public and private sectors (Lv et al., 2020). However, the role of innovation in achieving successful organizational performance remains an open question. This issue is particularly fundamental in the education sector, which is considered the second engine of human development in Malaysia (Bajuri et al., 2021). According to Bajuri et al. (2021), higher education relies heavily on innovation, making it more pertinent now than ever. Universities must adapt their economic models and service offerings to keep pace with rising education costs and the increasing importance of digital technologies in the educational experience to stay relevant to societies, economies, and, most importantly, organizational performance. Nevertheless, the relationship between innovation capability and organizational performance, particularly within higher education institutions, is still uncertain in the literature. Noor et al. (2022) recommends incorporating innovation capability into the organizational performance literature, especially in the context of higher education. To address this gap, the current study aims to examine the influence of innovation capability on organizational performance in higher education institutions in Malaysia.

There are conflicting findings regarding the relationship between knowledge-based human resource management (KHRM) practices and organizational performance. Some researchers have argued for a direct relationship (Singh et al., 2021; Carvache-Franco et al., 2022; Yousaf et al., 2018; Singh et al., 2019), while others have posited an indirect relationship (Kianto et al., 2021; Popa et al., 2017). Most previous studies (e.g., Singh et al., 2021; Yousaf et al., 2018; Carvache-Franco et al., 2022) have focused on the direct relationship between KHRM characteristics and organizational performance, with limited empirical knowledge about the underlying attributes that enhance performance. Direct relationships were not always significant; for instance, Kianto et al. (2021) found no significant direct effect of KHRM attributes on organizational performance and suggested the presence of a mediating variable in this relationship.

There is empirical evidence that innovation capability directly influences organizational performance. For example, Liu et al. (2022) argued that innovation is essential for organizational performance, enabling firms to keep up with market trends and discourage imitation by competitors, thereby contributing to economic growth. To sustain innovation, organizations need diverse perspectives on combining and utilizing all available resources. Knowledge-based HRM practices can inspire new knowledge and ideas that drive firm

innovation (Yusof et al., 2023). Yusof et al. (2023) further explain that these HRM practices primarily generate innovation capability, which may lead to improved organizational performance.

Thus, this study investigates the mediating role of innovation capability in the relationship between KHRM practices and organizational performance. The study incorporates Expectancy Theory (Valence-Instrumentality-Expectancy) (Victor Vroom, 1964) to justify the mediating role of innovation capability in the relationship between KHRM aspects and organizational performance.

3. Hypothesis Development

The concept of knowledge-based HRM emphasizes that organizational performance stems from a company's knowledge-related resources and competencies (Evangelista et al., 2023). According to Malik et al. (2020), a company's competence from a knowledge-based perspective depends on the motivation and capability of its employees to execute organizational actions proficiently, making human resources the primary drivers of organizational performance.

Several researchers in the literature (e.g., Gultekin et al., 2022; Evangelista et al., 2023) discuss three key knowledge-based HRM practices—recruitment and selection, training and development, and compensation—as crucial aspects that positively influence organizational performance. Additionally, Kianto et al. (2017) emphasize the importance of knowledge-based performance assessment alongside training and development, compensation, and recruitment and selection in positively impacting organizational performance. Gupta (2022) and Chen et al. (2020) also highlight knowledge-based empowerment as a significant factor in organizational performance.

Therefore, in the current study, we consider five main knowledge-based HRM practices—recruitment and selection, performance assessment, compensation, training and development, and empowerment—in the context of organizational performance.

Knowledge based Recruitment & Selection and Organizational Performance

Knowledge-based recruitment and selection involve an organizational strategy to hire employees who possess not only the necessary job-related skills but also social skills and growth potential. This approach recognizes that knowledge is a socially constructed phenomenon and that learning primarily occurs in a collaborative context (Kianto et al., 2021; Inkinen et al., 2020). Sia et al. (2020) emphasize the importance of employees' adaptability to changing circumstances and their capacity to learn and acquire new knowledge, which is crucial for the performance of higher education institutions. Moreover, Evangelista et al. (2023) argue that knowledge-based recruitment practices contribute to knowledge building and creativity within an organization, as newcomers bring in fresh knowledge and are eager to engage with existing employees. Gultekin et al. (2022) and Kianto et al. (2021) highlight that knowledge-based recruitment and selection practices are vital aspects of knowledge-based HRM that positively influence organizational performance. Additionally, a study by Li et al. (2022) on Taiwanese and UK logistics companies found that recruitment

practices play a key role in organizational performance. Therefore, the hypothesis is as follows:

Hypothesis 1a: *There is a positive relationship between knowledge-based recruitment & selection and organizational performance.*

Knowledge based Training & Development and Organizational Performance

Training and development opportunities for employees play a crucial role in enabling individuals to acquire new knowledge, enhance their existing skills, and stay abreast of emerging trends and advancements, especially in dynamic, knowledge-intensive organizations (Revista Venezolana de Gerencia, 2023; Kianto et al., 2021). To optimize organizational performance, it is vital to empower employees to take ownership of their own growth and provide flexible learning approaches, such as formal courses, on-the-job development opportunities, and distance e-learning, which enhance knowledge processes and positively impact organizational performance (Heliyon, 2023; Tein et al., 2021). Furthermore, implementing training practices that incentivize employees to share, create, and apply knowledge directly influences organizational performance (Muqadas et al., 2017; Nawaz, 2019). Therefore, the hypothesis is as follows:

Hypothesis 1b: *There is a positive relationship between the knowledge-based training & development and organizational performance.*

Knowledge based Compensation & reward and Organizational Performance

Compensation and reward practices, including bonuses, salary increments, status, and recognition incentives, can effectively motivate employees to create, share, and apply knowledge, which directly impacts organizational performance (Qu and Liu, 2022; Kianto et al., 2021). Knowledge-based compensation and reward practices enhance firm performance by improving knowledge processes such as creation, sharing, and utilization (Evangelista et al., 2023). Therefore, the proposed hypothesis is as follows:

Hypothesis 1c: *There is a positive relationship between the knowledge-based compensation & reward and organizational performance.*

Knowledge based performance assessment and Organizational Performance

Knowledge-based performance assessment is a crucial component of knowledge-based HRM practices that can positively influence organizational performance. Research by Kianto et al. (2021) on Spanish service-based companies found a significant positive relationship between knowledge-based performance assessment and organizational performance. Similarly, Chen et al. (2020) observed a positive relationship between these variables in Chinese manufacturing companies. These findings suggest that effective performance assessment practices, particularly those focused on knowledge-based aspects, can enhance organizational performance. Therefore, the hypothesis is as follows:

Hypothesis 1d: *There is a positive relationship between the knowledge-based performance assessment and organizational performance.*

Knowledge based empowerment and Organizational Performance

Empowerment is widely acknowledged as a significant predictor of positive organizational outcomes. Several studies (Jiakui et al., 2023; Li et al., 2022) have underscored the importance of empowerment in driving organizational performance. Ramayah et al. (2020), Zhou et al. (2023), and Ryu et al. (2021) have identified key aspects of empowerment including responsibility and accountability, knowledge and skills, autonomy, access to information, creativity, innovation, and decision-making authority. Specifically, empowerment based on knowledge and skills has been found to positively correlate with organizational performance.

Moreover, knowledge plays a critical role in empowerment by enabling employees to understand what is essential for achieving organizational goals and maintaining competitive advantage (Susanty et al., 2019; Zhang et al., 2019). This suggests that knowledge-based empowerment is positively associated with organizational performance. Thus, the proposed hypothesis is as follows:

Hypothesis 1e: There is a positive relationship between knowledge-based empowerment and organizational performance.

Innovation capability refers to an organization's capacity to continually transform knowledge and ideas into new products, processes, and structures that benefit the company and its stakeholders (Lyu et al., 2022). Damanpour et al. (2009) define innovation as the introduction of a novel product or service, a new manufacturing process or technology, a fresh organizational structure or management system, or a new plan or program involving organizational members.

Organizational performance encompasses various dimensions that gauge a company's success and achievements (Hassi, 2019; Liu and Kang, 2021; Liao et al., 2021). Both performance and innovation are critical for long-term success in any business (Harris et al., 2021; Malik et al., 2020). Innovation capability is widely recognized as pivotal for gaining competitive advantage and ensuring sustainable success in businesses (Migdadi, 2020; Liao et al., 2021; Irfan et al., 2021). Li et al. (2020) highlights that innovation capability is among the most significant drivers enabling companies to attain high levels of competitiveness and performance. Moreover, researchers like Ramayah et al. (2020) and Gürlek and Çemberci (2020) argue that firms with robust innovation capabilities can cultivate competitive advantages and achieve superior business performance.

Empirical studies (e.g., Liao et al., 2019; Migdadi, 2020) consistently find that innovation capability serves as a crucial factor and intangible asset for organizations to generate value and sustainable competitive advantages, leading to enhanced performance in the SME industry. Building on this body of literature, the proposed hypothesis is as follows:

Hypothesis 2: There is a positive relationship between the innovation capability and organizational performance.

The direct relationship between KHRM attributes and organizational performance lacks clarity in the literature. Some studies (e.g., Li et al., 2022; Kianto et al., 2021) have reported a positive association, whereas others (e.g., Hameed et al., 2021; Harris et al., 2021; Irfan et al., 2022; Gürlek and Çemberci, 2020) have found no direct link, suggesting the presence of a

mediating factor. Innovation capability has been identified as a multifaceted aspect, with researchers (e.g., Kianto et al., 2021; Migdadi, 2020; Ge et al., 2022) recommending its consideration as a mediating variable. Wang et al. (2022) conducted a study indicating potential enhancement in organizational performance through employees' innovation capability.

Ahmad et al. (2021) argues that KHRM practices foster an innovative environment that facilitates higher organizational performance. Migdadi (2020) and Mehrez (2019) emphasize the need to incorporate innovation in studying the relationship between KHRM and organizational performance in future research. Ramayah et al. (2020) underscores that effective management of human capital, focusing on innovation, can lead to improved organizational performance. Ryu et al. (2021) suggest that effective HR practices promoting innovation contribute to superior business performance. The application of knowledge-based view theory in existing research supports a positive correlation between knowledge-based resources, innovation capability, and performance (e.g., Zhang et al., 2019; Shobande and Asongu, 2022). Moreover, as highlighted by Zhou et al. (2023), effective management of knowledge resources is a key proposition of the knowledge-based view theory, enhancing innovation, and subsequently improving organizational performance.

The theoretical framework, particularly the Expectancy theory, suggests that innovation mediates the relationship between KHRM and organizational performance. Despite the well-established theoretical link between KHRM, innovation, and organizational performance through the knowledge-based view and human capital theory, research has yet to explore how knowledge-based HRM indirectly impacts organizational performance through innovation capability, especially within higher education institutions in Malaysia. The Expectancy model remains underutilized in HR studies, particularly in delineating the specific attributes of knowledge-based HRM practices that significantly influence organizational performance via innovation capabilities.

By comprehensively integrating the Expectancy model, this study aims to elucidate the synergistic indirect effects of these constructs on organizational performance within Malaysian higher education institutions. Thus, this study seeks to investigate whether the provision of appropriate knowledge-based HRM practices by Malaysian higher education institutions enhances staff innovation capabilities and whether this enhancement translates into positive outcomes such as higher performance. Consequently, the following hypotheses are proposed:

Hypothesis 3a: Innovation Capabilities mediate the relationship between knowledge-based recruitment & selection and organizational performance.

Hypothesis 3b: Innovation Capabilities mediate the relationship between knowledge-based training & development and organizational performance.

Hypothesis 3c: Innovation Capabilities mediate the relationship between knowledge-based compensation & reward and organizational performance.

Hypothesis 3d: Innovation Capabilities mediate the relationship between knowledge-based performance assessment and organizational performance.

Hypothesis 3e: Innovation Capabilities mediate the relationship between knowledge-based empowerment and organizational performance.

4. Research Methodology

The current study adopts a positivist approach focused on hypothesis testing, employing a quantitative method to investigate the relationship between Knowledge-Based Human Resource Management (KHRM) aspects (independent variables) and the performance of higher education institutions in Malaysia (dependent variable). The quantitative survey method is advantageous due to its ability to accommodate a larger sample size, making it particularly suited for capturing insights from a broad population (Teddle & Tashakkori, 2019).

A cross-sectional time horizon technique was chosen, aligning with the research goal of identifying predictors of organizational performance within a specific timeframe using multivariate analysis techniques. According to Creswell (2003), a cross-sectional research design effectively captures perspectives from a large sample within a relatively short period, with minimal logistical complexity.

Malaysia boasts over 590 higher education institutions, including 50 private and 20 public universities, with approximately 43,428 academic staff members (Ministry of Higher Education Malaysia, 2022). This study focuses on the performance of universities in Kuala Lumpur (24 universities) and Selangor (21 universities), targeting academic employees. Using Raosoft with a margin of error of 5% and a confidence level of 95%, the calculated sample size was 383. However, the study gathered 311 properly completed responses after data collection. Therefore, the sample size for this study was determined to be 311, which aligns with recommendations in the literature regarding structural equation modelling and sample size adequacy (Hair et al., 2010).

Given the challenge of obtaining a comprehensive list of all academic employees, non-probability sampling, specifically purposive sampling, was employed. Purposive sampling involves selecting respondents who possess specific characteristics relevant to the study's objectives, facilitating a focused exploration of key themes (Sekaran & Bougie, 2010).

Data was collected using a questionnaire adapted from methodologies used by Kianto et al. (2017) and Hamilton and Davison (2018). Partial Least Squares Structural Equation Modelling (PLS-SEM) was utilized to analyse the collected data, providing a robust method to examine the relationships hypothesized in the study.

5. Results

Measurement Model Assessment

The measurement model analysis results are shown in Table 1. Outer loadings were between 0.728 and 0.958, which satisfied the minimum threshold (Hair et al., 2006). Also, Cronbach's alpha values exceeded the cut-off value of 0.7 (Cronbach, 1951) and composite reliability values were above the recommended value of 0.70 (Nunnally & Bernstein, 1994), confirming the model's internal consistency reliability. Similarly, the average variance extracted (AVE) for each latent variable was higher than 0.5, demonstrating the constructs' convergent validity (Fornell & Larcker, 1981).

Table 1: Internal Consistency and Convergence Validity

	F/Loadings	C. Alpha	CR	CR (rho_c)	AVE
CS		0.915	0.922	0.947	0.855
CS1	0.894				
CS2	0.957				
CS3	0.922				
EM		0.939	0.942	0.957	0.846
EM1	0.948				
EM2	0.922				
EM3	0.902				
EM4	0.908				
		0.855	0.860	0.904	0.705
IC1	0.859				
IC2	0.908				
IC3	0.925				
IC4	0.951				
		0.938	0.940	0.956	0.845
OP1	0.867				
OP2	0.942				
OP3	0.952				
OP4	0.914				
		0.840	0.848	0.904	0.758
PS1	0.935				
PS2	0.879				

PS3	0.792				
		0.793	0.826	0.879	0.710
RS1	0.728				
RS2	0.881				
RS3	0.908				
		0.910	0.921	0.937	0.788
TD1	0.836				
TD2	0.872				
TD3	0.927				
TD4	0.913				

Notes: CR: Composite Reliability; AVE: Average Variance Extracted; CA: Cronbach's Alpha

RS=Recruitment & Selection; PS=Performance Assessment; CS=Compensation; EM=Empowerment; TD=Training & Development; IC=Innovative Capability; OP=Organizational Performance

Discriminant validity was evaluated by the heterotrait-monotrait ratio (HTMT) method which is considered more valid than cross-loadings and the Fornell-Larcker criterion (Hair et al., 2006). The values of HTMT must be less than 0.90 (Henseler et al., 2015). Table 2 indicates that the highest HTMT value was 0.847, which attained discriminant validity.

Table 2: Heterotrait-Monotrait Ratio (HTMT) Results

Constructs	CS	RS	PS	EM	TD	IC	OP
CS							
RS	0.824						
PS	0.111	0.758					
EM	0.710	0.123	0.824				
TD	0.716	0.117	0.830	0.076			
IC	0.847	0.838	0.031	0.815	0.812		

OP 0.060 0.812 0.168 0.727 0.719 0.139

Note: HTMT <0.85 (Kline, 2010), HTMT <0.90 (Gold et al., 2000); RS=Recruitment & Selection; PS=Performance Assessment; CS=Compensation; EM=Empowerment; TD=Training & Development; IC=Innovative Capability; OP=Organizational Performance

Structural Model Assessment

To evaluate the structural model in this work, the following metrics are needed: coefficient of determination (R^2) for endogenous variables, path coefficient (β), prediction relevance (q^2), effect size (f^2), and collinearity (inner VIF) (Ho, 2013; Henseler et al., 2016). The necessary rule of thumb value and rationale for each criterion are listed below.

The R^2 results of this study are shown in Table 3, and all R^2 values of endogenous variables are greater than 25%, indicating that the independent factors explain a significant portion of the variance (Peng and Lai, 2012).

Table 3: R-square Result

Endogenous Variables	R Square	R Square Adjusted
Innovation Capability	0.361	0.360
Organizational Performance	0.444	0.443

Substantial > 0.25; Moderate > 0.12, Weak > 0.02 (Cohen, 1989)

The result of F^2 shown in Table 4. The value of F^2 from 0.02 to 0.15 signifies a small effect although the value from 0.15 to 0.35 signifies a medium influence, and the values of F^2 above 0.35 signify a larger influence (Sarstedt et al., 2017). The revealed results indicate that the effect of CS (Compensation), RS (Recruitment & Selection), and TD (Training & Development) towards IC (Innovation Capability) has a small effect as the values of f^2 are lie 0.02 to 0.15. However, EM (Empowerment) and PS (Performance Assessment) have a medium effect on IC (Innovation Capability). Similarly, CS (Compensation), RS (Recruitment & Selection), and TD (Training & Development) on OP (Organizational Performance) has a small effect. However, the effect size of IC (Innovation Capability) on OP (Organizational Performance) is large. The effect of EM (Empowerment) and PS (Performance Assessment) on OP (Organizational Performance) has a small effect.

Table 4: F-Square Result

Exogenous Variables	IC	OP
CS	0.183	0.144
RS	0.019	0.041
PS	0.180	0.141
EM	0.013	0.042
TD	0.095	0.000
IC		0.883

Large: f^2 effect size > 0.34; Medium effect > 0.14; Small: $0.0 > 0.01$ (Cohen, 1988)

The results of VIF shown in Table 5, indicate that the highest inner VIF value is 3.241 and the lowest VIF value is 1.063 that indicating no presence of multicollinearity in exogenous variables.

Table 5: Multicollinearity – Inner VIF Values

	IC	OP
CS	2.857	2.753
RS	3.241	1.771
PS	2.879	1.534
EM	1.429	2.354
TD	2.241	1.641
IC		1.063

Note: VIF < 3.33; Variables are tested on dependent variables of IC, and OP.

To assess the predictive capability (Q^2) of the structural model, the Q^2 test is considered. A blindfolding test is run to compute the Q^2 value. The whole model validates an acceptable fit and high predictive relevance as Q^2 values are greater than zero that is presented in Table 6.

Table 6: Result of Predictive Relevance

Endogenous Constructs	CCR Q ² (=1-SSE/SSO)	CCC Q ² (=1-SSE/SSO)
IC	0.571	0.585
OP	0.611	0.315

Note: CCC=Construct Cross-validated Commuality, CCR=Construct Cross-validated Redundancy

Path Coefficient Analysis

Table 7 shows the path coefficient results of the structural model. The significant path with the strongest relationship was EM (knowledge-based empowerment) and OP (Organizational performance) with the value of $\beta=0.957$ ($p=0.000$), therefore providing support for H1e. However, the weakest but significant path was RS (Knowledge based recruitment & selection) and OP (Organizational performance) ($\beta=0.199$; $p=0.000$), hence providing support for H1a. The other five paths designated moderate associations. Three elements paths significantly associated to OP; RS (knowledge-based recruitment & selection) to OP ($\beta=0.310$, $p<0.05$), TD (knowledge-based training & development) to OP ($\beta=0.420$, $p<0.05$), and CS to OP ($\beta=0.400$, $p<0.05$), giving support for H1a, H1b, and H1c. Though, the relationship between PS (knowledge-based performance assessment) and OP was not significant ($\beta=-0.392$, $p>0.05$), thus H1d was not supported. The path IC (innovation capability) to OP (organizational performance) ($\beta=0.307$, $p<0.05$) was also significant, therefore, H2 is supported.

Table 7: Structural Model (Direct Effect)

	Hypothesis	Std. Beta	S.E	t-values	p-values	LLCI	ULCI	Decision
CS -> OP	H1c	0.400	0.071	5.550	0.000	0.269	0.541	Supported
EM -> OP	H1e	0.957	0.087	10.937	0.000	0.784	1.136	Supported
IC -> OP	H2	0.307	0.116	2.681	0.004	-0.516	-0.076	Supported
PS -> OP	H1d	-0.392	0.053	7.385	0.000	-0.502	-0.290	Not Supported
RS -> OP	H1a	0.310	0.068	4.624	0.000	0.156	0.433	Supported
TD -> OP	H1b	0.420	0.081	5.188	0.000	-0.588	-0.260	Supported

Significant: $p < 0.05$; IC=Innovation Capability, CS= Compensation, EM=Empowerment, RE=Recruitment & Selection, TD=Training & development, OP= Organizational

Performance.

Indirect (Mediation) Effect Analysis

For the mediating analysis, the bootstrapping method was carried out for this study which was recommended by Hayes & Rockwood (2016). The outcomes of the mediation analysis in Table 8 demonstrated that among the five mediating hypotheses, three were supported. The mediating paths were significant as the p-values were less than 0.05 and LL (Lower limit) and UL (Upper limit) both were either positive or negative, with no zero in between, approving the paths were significant. However, the significant path with the strongest association was CS to IC to OP ($\beta=0.138$, $p=0.001$), therefore giving support for H4c. The weakest but significant path was PS to IC to OP with the value of $\beta=0.017$ ($p=0.042$), therefore giving support for H4d. The other 1 indirect path designated moderate associations. IC significantly mediate the association of TD to IC to OP ($\beta=0.119$, $p<0.05$), providing support for H4b. Though, the association between RS to IC to OP ($\beta= -0.108$, $p>0.05$) and EM to IC to OP ($\beta= 0.008$, $p>0.05$) was not significant, thus H4a and H4e was not supported.

Table 8: Structural Model (Indirect Effect)

	Hypothesis	Std. Beta	S.E	t-values	p-values	LLCI	ULCI	Decision
RS -> IC -> OP	H4a	-0.108	0.042	2.633	0.009	-0.190	-0.033	Not Supported
TD -> IC -> OP	H4b	0.119	0.009	1.091	0.045	-0.033	0.003	Supported
CS -> IC -> OP	H4c	0.138	0.016	2.500	0.013	0.012	0.072	Supported
EM -> IC -> OP	H4e	0.008	0.011	0.804	0.422	-0.014	0.034	Not Supported
PS -> IC -> OP	H4d	0.017	0.009	1.941	0.042	-0.040	-0.004	Supported

Significant: $p < 0.05$; IC=Innovation Capability, CS= Compensation, EM=Empowerment, RE=Recruitment & Selection, TD=Training & development, OP= Organizational Performance.

6.Discussion and Conclusion

The current study was conducted based on the conceptual framework comprising five variables (i.e., knowledge-based compensation, knowledge-based recruitment & selection, knowledge-based performance appraisal, and knowledge-based empowerment). The general objective of this research was to determine the impact of knowledge based human resource aspects on organizational performance with the mediating role of innovation capability in higher education institutions in Malaysia. Supported by the Human Capital Theory and Expectancy Theory, this study proposed that an innovation capability plays a mediating role in linking knowledge based HRM characteristics to organizational performance.

Based on the analysis outcomes, all knowledge based HRM aspects except performance appraisal showed a significant association with organizational performance of higher education institutions in Malaysia. This supports the idea of Human Capital Theory (Becker, 1962) that internal knowledge of human capital enhanced the performance of an organization. This result also supports several empirical deliberations, such as the evidence of Gursoy and Chi (2020) that the performance of an institution is mainly reflected by enhancement of knowledge based human resources. Similarly, Suksod and Cruthaka (2020) pointed out that HRM practices based on knowledge such as training, recruitment & selection, empowerment and compensation enhance the performance of an organization. However, the relationship between knowledge-based performance assessment and organizational performance was not significant. This contrasts with the study of Kianto et al. (2021) conducted on Spanish services-based companies found a significant positive relationship with organizational performance. The insignificant finding in the current study could be because Malaysia is a hub of higher education globally where performance assessment system is more updated. Malaysian universities use the SETARA system for performance appraisal which is a ranking system that aims to ensure the maintenance of the quality assurance as well as standards of Malaysian higher education institutions.

Innovation capability was found to be a significant driver of organizational performance in higher education institutions Malaysia. This finding aligns with Jayaram et al.'s (2014) argument that innovation enhances organizational performance. Su et al. (2018) emphasized that innovation capability enables a company to apply appropriate technologies to develop new products, meet market demands, and alleviate competitive pressures. This capability helps build and enhance various competencies within the company, effectively supporting the integration of these competencies and driving innovation. It also supports the notion of the Contingency Theory proposed by Fred and Fiedler (1960) that internal fit (innovation capability) works cohesively to convey a consistent message and achieve the desired outcomes (performance) of an organization.

The findings show that innovation capability has a mediating effect between three knowledge based HRM aspects (training & development, compensation and performance assessment) and higher education institutions performance. However, an insignificant result was found in the case of the mediating effect of innovation capability between empowerment as well as recruitment & selection and higher education institutions performance in Malaysia. In addition, the findings also revealed that innovation capability has a mediating impact between human capital and higher education institutions performance in Malaysia. The findings of this study are consistent with previous research. For example, a study by Al-Taweel and Al-Hawary (2021) identified a significant relationship between organizational performance and the ability to manage innovation resources, ensuring efficiency and alignment with evolving customer needs.

Implications

Theoretically, the study highlights that knowledge based HRM practices, including recruitment & selection, training & development, compensation, and empowerment, are pivotal factors for enhancing organizational performance. These practices enable higher education institutions to identify market opportunities and assess the suitability of their internal strengths to exploit these opportunities. Moreover, they facilitate the enhancement of academic staff's skills and expertise, thereby improving their performance. Furthermore, ongoing knowledge-based training & development practices enable organizations to expand their capacity to adapt to technological advancements. Consequently, these components play a pivotal role in enhancing organizational performance. This study also introduces knowledge based HRM attributes to the literature on organizational performance.

Additionally, the mediating role of innovation capability in the relationship between KHRM, and organizational performance underscores the importance of imparting appropriate knowledge, training, and expertise to personnel to foster motivation and enhance their proficiency in their roles. Additionally, it is imperative for organizations to provide personnel with relevant databases, accessible structures, and information, while fostering a collaborative and supportive relationship with external stakeholders. Furthermore, while Expectancy theory has been explored to a limited extent in higher educational studies, this research introduces and extends this theory into educational literature. This expansion enriches the understanding of expectancy theory dynamics within the context of education. This research on diverse HRM methods aims to clarify and enrich the research technique, leading to better business process innovation. This information search not only improves business process innovation but also provides organizations with benefits such as sustained competitive advantage, enhanced performance, and productivity.

Practically, the findings of this study revealed a significant and positive relationship between knowledge based HRM attributes and organizational performance. This has significant implications for the development of effective knowledge based human resource management practices within universities. By enhancing knowledge based HRM practices among academic staff, universities can foster innovation capability. This, in turn, can lead to improved performance and competitiveness. Understanding the factors that enhance academic staff's innovation capability skills will enable higher education management to improve staff satisfaction and responsiveness in an ever-changing environment. However, policymakers of higher education institutions, including those in Malaysia, can use the findings of this research as a reference in developing appropriate policies to promote the concept of knowledge based HRM. For instance, knowledge-based empowerment emerges as the most crucial aspect of knowledge-based HRM for academic staff in higher education institutions. Academic staff in Malaysia expect to receive support in knowledge based HRM practices from their institutions. Thus, managers of higher education institutions should consider implementing knowledge based HRM practices and enhancing human capital to boost confidence among academic staff. It is highly recommended for higher education service providers and managers in Malaysia to enhance existing HRM practices by incorporating knowledge based HRM practices. The skills, empowerment, knowledge, and

capabilities of employees are vital for higher education institutions. For academic staff, institutions must prioritize innovation leadership to ensure operational efficiency, given the layered nature of their work.

Limitations and Future Directions

Although this study has contributed significantly to both the literature and practice in the field of higher education, there are still several limitations that present opportunities for future research.

Firstly, this research did not explore various characteristics such as knowledge-based leadership, knowledge-based career planning, and knowledge-based diversity characteristics for employees of higher education institutions in different developing and emerging countries such as Indonesia, Malaysia, Bangladesh, and Pakistan. As these aspects are more important to enhance organizational performance (Li et al., 2022). Thus, including these characteristics in future research could provide a more comprehensive understanding of knowledge based HRM aspects in diverse emerging and developing countries.

Secondly, this study did not investigate the direct relationship between knowledge based HRM (KHRM) and innovation capability, although Li et al. (2022) emphasized on the direct impact of KHRM the innovation capability of an organization. Therefore, future studies could focus on examining the direct impact of different KHRM aspects such as empowerment, leadership, career planning, and training on the innovation capability of employees. This could help business developers and marketers of higher education institutions better understand the needs and preferences of employees.

Thirdly, this study did not identify moderators between innovation capability and organizational performance. Future research is recommended to investigate moderators such as perceived risk, which reflects the risks and uncertainties that employees face when choosing novelty in their careers, as it is a significant characteristic that affects organizational performance (Li et al., 2022). Exploring this moderator could provide valuable insights into the factors influencing the relationship between innovation capability and organizational performance.

Conclusion

Knowledge-based human resource management practices and human capital represent a rapidly expanding area, with educational institutions increasingly embracing knowledge-centric activities. There is a rising demand for knowledge-based practices, innovation capabilities, and human capital, underscoring the need for comprehensive research to fully harness their potential and effectively serve employees. As such, higher education institutions must proactively adopt optimal knowledge-based HRM practices that cater to employee requirements. This study offers valuable insights for practitioners and policymakers alike, highlighting the critical role of knowledge-based HRM, innovation capability, and human capital in enhancing organizational performance.

References

- American Psychological Association. (1972). *Ethical standards of psychologists*. Washington,
- Al-Taweel, I.R.; Al-Hawary, S.I. (2021). The Mediating Role of Innovation Capability on the Relationship between Strategic Agility and Organizational Performance. *Sustainability* 2021, 13, 7564. <https://doi.org/10.3390/su13147564>
- Azman, N. & Abdullah, D. (2020). A Critical Analysis of Malaysian Higher Education Institutions' Response Towards COVID-19: Sustaining Academic Program Delivery. *Journal of Sustainability Science and Management*. 16. 70-96. 10.46754/jssm.2021.01.008.
- Brinckmann, J., Dew, N., Read, S., Mayer-Haug, K., & Grichnik, D. (2019). Of those who plan: A meta-analysis of the relationship between human capital and business planning. *Long Range Planning*, 52(2), 173–188
- Cooper-Thomas, H. D., and Morrison, R. L. (2019). *Give and take: needed updates to social exchange theory*. *Ind. Organ. Psychol.* 11, 493–498. doi: 10.1017/iop.2018.101.
- Cao J, Liu J, Wong JWC (2023) JD-R model on job insecurity and the moderating effect of COVID-19 perceived susceptibility. *Curr Psychol*. <https://doi.org/10.1007/s12144-023-04646-6>
- Chen, M. Y.-C., Lam, L. W., & Zhu, J. N. (2020). Should companies invest in human resource development practices? The role of intellectual capital and organizational performance improvements. *Personnel Review*, 50(2), 460–477.
- Cheng M., Adekola O., Albia J. & Cai S. (2022). Employability in higher education: A review of key stakeholders' perspectives. *Higher Education Evaluation and Development*, 16 (1), 16–31.
- Crawford, J., Cifuentes-Faura, J., (2022). Sustainability in higher education during the COVID-19 pandemic: a systematic review. *Sustainability* 14 (3), 1879. <https://doi.org/10.3390/su14031879>.
- Dhar, B. K., Mutalib, M., & Sobhani, F. A. (2019). Effect of innovation capability on human capital and organizational performance. *International Journal of Advanced Science and Technology*, 29(4), 7074–7087.
- Dingler, A., & Enkel, E. (2016). Socialization and innovation: Insights from collaboration across industry boundaries. *Technological Forecasting and Social Change*, 109, 50– 60.
- Dirani, K. M., Abadi, M., Alizadeh, A., Barhate, B., Garza, R. C., Gunasekara, N., & Majzun, Z. (2020). Leadership competencies and the essential role of human resource development in times of crisis: a response to Covid-19 pandemic. *Human resource development international*, 23(4), 380–394.
- Dirani, K. M., Abadi, M., Alizadeh, A., Barhate, B., Garza, R. C., Gunasekara, N., & Majzun, Z. (2020). Leadership competencies and the essential role of human resource development in

times of crisis: a response to Covid-19 pandemic. *Human resource development international*, 23(4), 380–394.

Evangelista, P.; Kianto, A.; Hussinki, H.; Vanhala, M.; Nisula, A.-M. (2023) Knowledge-Based Human Resource Management, Logistics Capability, and Organizational Performance in Small Finnish Logistics Service Providers. *Logistics* 2023, 7, 12. <https://doi.org/10.3390/logistics7010012>.

Enad Al-Qaralleh R, Atan T (2022) Impact of knowledge-based HRM, business analytics and agility on innovative performance: linear and FsQCA findings from the hotel industry. *Kybernetes* 51(1):423–441. <https://doi.org/10.1108/K-10-2020-0684>

Felício, J. A., Couto, E., & Caiado, J. (2014). Human capital, social capital and organizational performance. *Management Decision*, 52(2), 350–364.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of marketing research*, 18(1), 39–50.

Farrukh, S., Salim, N., Abdulrahman, H., Altalhi, Z. U., Al-Malaise, A., & Zahid, M. K. (2020). Assessing the effects of information and communication technologies on organizational development: Business values perspectives. *Information Technology for Development*, 26(1), 54–88. <https://doi.org/10.1080/02681102.2017.1335279>.

Gultekin, B.; Demir, S.; Gunduz, M.A.; Cura, F.; Ozer, L. (2022)The Logistics Service Providers during the COVID-19 Pandemic: The Prominence and the Cause-Effect Structure of Uncertainties and Risks. *Comput. Ind. Eng.* 2022, 165, 107950.

Gupta, K., Goel, S., & Bhatia, P. (2020). Intellectual Capital and Profitability: Evidence from Indian Pharmaceutical Sector. *Vision (Basel)*, 24(2), 204–216. doi:10.1177/0972262920914108

Gupta, K., & Raman, T. V. (2020). Intellectual capital: a determinant of firms' operational efficiency. *South Asian Journal of Business Studies*. 10.1108/SAJBS-11-2019-0207.

Ghardallou, W., (2022). Corporate sustainability and firm performance: the moderating role of CEO education and tenure. *Sustainability* 14 (6), 3513. <https://doi.org/10.3390/su14063513>.

Gui L, Lei H, Le PB (2022) Determinants of radical and incremental innovation: the influence of transformational leadership, knowledge sharing and knowledge-centered culture. *Eur J Innov Manag* 25(5):1221–1241. <https://doi.org/10.1108/EJIM-12-2020-0478>

Gürlek M (2021) Effects of high-performance work systems (HPWSs) on intellectual capital, organizational ambidexterity and knowledge absorptive capacity: evidence from the hotel industry. *J Hosp Market Manag* 30(1):38–70. <https://doi.org/10.1080/19368623.2020.1774029>.

Henseler, J., Ringle, C. M., & 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.

Hamilton RH, Davison HK (2018) The search for skills: knowledge stars and innovation in the hiring process. *Bus Horiz* 61(3):409–419. <https://doi.org/10.1016/j.bushor.2018.01.006>

Hameed WU, Nisar QA, Wu H-C (2021) Relationships between external knowledge, internal innovation, firms' open innovation performance, service innovation and business performance in the Pakistani hotel industry. *Int J Hosp Manag* 92:102745. <https://doi.org/10.1016/j.ijhm.2020.102745>

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2012). *Multivariate Data Analysis* (7th ed.). Pearson Prentice Hall.

Hamann, P. Maik & Schiemann, Frank, (2021). "Organizational performance as a set of four dimensions: An empirical analysis," Journal of Business Research, Elsevier, vol. 127(C), pages 45-65.

Henseler, Ringle, & Sinkovics. (2009). The use of partial least squares path modelling in international marketing. *Advances in international marketing*, 20(1), 277-319.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2012). *Multivariate Data Analysis* (7th ed.). Pearson Prentice Hall.

Hair, J. F., Sarstedt, M., Ringle, C. M., & Gudergan, S. P. (2017) *Advanced issues in partial least squares structural equation modelling*. Sage publications, thousand oaks. United States: California

Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2019). The use of partial least squares path modelling in international marketing. *Advances in International Marketing*, 20, 277-319.

Hamilton RH, Davison HK (2018). The search for skills: knowledge stars and innovation in the hiring process. *Bus Horiz* 61(3):409–419. <https://doi.org/10.1016/j.bushor.2018.01.006>

Hassi A (2019). Empowering leadership and management innovation in the hospitality industry context. *Int J Contemp Hosp Manag* 31(4):1785–1800. <https://doi.org/10.1108/IJCHM-01-2018-0003>.

Irfan, SM, Qadeer, F, Abdullah, MI, & Sarfraz, M (2022). Employer's investments in job crafting to promote knowledge worker's sustainable employability: a moderated mediation model. *Pers Rev*. <https://doi.org/10.1108/PR-10-2021-0704>.

Jelicic Kadic, A., Kovacevic, T., Runjic, (2020). Research methodology used in the 50 most cited articles in the field of pediatrics: types of studies that become citation classics. *BMC Med Res Methodol* 20, 60 (2020). <https://doi.org/10.1186/s12874-020-00940-0>.

Jobira, A. F., & Mohammed, A. A. (2021). Predicting organizational performance from motivation in Oromia Seed Enterprise Bale Branch. *Humanities & Social Sciences Communications*, 8(66), 1–7. <https://doi.org/10.1057/s41599-021-00742-9>.

Kianto A, Sáenz J, Aramburu N (2017). Knowledge-based human resource management practices, intellectual capital and innovation. *J Bus Res* 81:11–20. <https://doi.org/10.1016/j.jbusres.2017.07.018>.

Kim, Y.-A., Kim, K.-A., and Tzokas, N. (2022). *Entrepreneurial universities and the effect of the types of vocational education and internships on graduates' employability*. *Stud. High. Educ.* 47, 1–10. doi: 10.1080/03075079.2022.2055324.

Kianto A, Sáenz J, Aramburu N (2021). Knowledge-based human resource management practices, intellectual capital and innovation. *J Bus Res* 81:11–20. <https://doi.org/10.1020/j.jbusres.2021.07.018>.

Krishnaswamy, J., [Nyepit, C.B.](#) and Leow, N.X. (2023), "The perceptions of master and bachelor students on the performance of private higher education institutions – an empirical study in Malaysia", [International Journal of Educational Management](#), Vol. 37 No. 4, pp. 721-736. <https://doi.org/10.1108/IJEM-01-2022-0025>.

Liu S-M, Kang T-W (2021). The effects of absorptive capability and innovative culture on innovation performance: evidence from Chinese high-tech firms. *J Asian Financ Econ Bus* 8(3):1153–1162. <https://doi.org/10.13106/jafeb.2021.vol8.no3.1153>.

Li Sa ML, Choon-Yin S, Chai YK, Aik Joo JH (2020). Knowledge creation process, customer orientation and firm performance: Evidence from small hotels in Malaysia. *Asia Pacific Manag Review* 25(2):65–74. <https://doi.org/10.1016/j.apmr.2019.07.002>

Lyu C, Peng C, Yang H, Li H, Gu X (2022), Social capital and innovation performance of digital firms: Serial mediation effect of cross-border knowledge search and absorptive capacity. *J Innov Knowl* 7(2):100187. <https://doi.org/10.1016/j.jik.2022.100187>.

Mehrez A (2019), Investigating the effectiveness of practicing knowledge management in the hospitality industry: the case of Qatar. *Int J Knowl Manag Stud* 10(2):101. <https://doi.org/10.1504/IJKMS.2019.099119>.

Meira, J.V.d.S. and Hancer, M. (2021), "Using the social exchange theory to explore the employee-organization relationship in the hospitality industry", [International Journal of Contemporary Hospitality Management](#), Vol. 33 No. 2, pp. 670-692. <https://doi.org/10.1108/IJCHM-06-2020-0538>

Meijerink, J. G., Bondarouk, T., & Lepak, D. P. (2016). Employees as active consumers of HRM: Linking employees' HRM competences with their perceptions of HRM service value. *Human Resource Management*, 55(2), 219–240. doi:10.1002/hrm.21719.

Muqadas, F., Rehman, M., Aslam, U., & Ur-Rahman, U. (2017). Exploring the challenges, trends and issues for knowledge sharing. *VINE Journal of Information and Knowledge Management Systems*, 47(1), 2–15. doi:10.1108/VJIKMS-06-2016-0036.

Migdadi, M. M. (2020). Knowledge management processes, innovation capability and organizational performance. *International Journal of Productivity and Performance Management*, ahead-of-print (ahead-of-print). doi:10.1108/ijppm-04-2020-0154.

Melaas, A.; Zhang, F. (2016). National Innovation Systems in the United States and China: A Brief Review of the Literature. Energy, Climate, and Innovation Program (ECI); Center for International Environment and Resource Policy (CIERP): Medford, MA, USA, 2016.

Mohsin M, Jamil K, Naseem S, Sarfraz M, Ivascu L (2022). Elongating nexus between workplace factors and knowledge hiding behavior: mediating role of job anxiety. *Psychol Res Behav Manag ume* 15:441–457. <https://doi.org/10.2147/PRBM.S348467>

Malik A, Froese FJ, Sharma P (2020). Role of HRM in knowledge integration: towards a conceptual framework. *J Bus Res* 109:524–535. <https://doi.org/10.1016/j.jbusres.2019.01.029>

Naz, F., Aftab, J., & Awais, M. (2016). Impact of human resource management practices (HRM) on performance of SMEs in Multan, Pakistan. *International Journal of Management. Accounting and Economics*, 3(11), 699–708.

Pruthi T, Srivastava N, Rana V, Kaushik N, Singh R (2020). Scientific publication: a tool to enhance to quality of research: *International Journal of applied dental sciences* 2020;6(1):244-246.

Ramadhan DG, Sofiyanurriyanti (2020) Knowledge management as a source of innovation and business process development to improve the competitiveness of small and medium enterprises (SMES) in the madurese handicraft souvenir sector (case study: XYZ souvenir). *IOP Conf Ser Mater Sci Eng* 885(1):012034. <https://doi.org/10.1088/1757-899X/885/1/012034>.

Raman, R., Sairam, B., Veena, G., Vachharajani, H., and Nedungadi, P. (2021). Adoption of online proctored examinations by university students during COVID-19: Innovation diffusion study. Educ. Inf. Technol. 26, 7339–7358. doi: 10.1007/s10639-021-10581-5.

Ramayah T, Soto-Acosta P, Kheng KK, Mahmud I (2020) Developing process and product innovation through internal and external knowledge sources in manufacturing Malaysian firms: the role of absorptive capacity. *Bus Process Manag J* 26(5):1021–1039. <https://doi.org/10.1108/BPMJ-11-2019-0453>.

Ryu D, Park T, Kim K, Park J (2021) Knowledge-based HRM practices, absorptive capacity and innovation performance: the moderating effect of the strategic orientation of HR functions. 1:165–1182. <https://doi.org/10.2478/orga-2019-0002>

Sia, J. K.-M., & Abbas Adamu, A. (2020). Facing the unknown: pandemic and higher education in Malaysia. *Asian Education and Development Studies*, ahead-of-print (ahead-of-print). doi:10.1108/aeds-05-2020-0114.

Shobande, O.A., Asongu, S.A., (2022). The critical role of education and ICT in promoting environmental sustainability in eastern and southern Africa: a Panel VAR approach. *Technol. Forecast. Soc. Change* 176, 121480. <https://doi.org/10.1016/j.techfore.2022.121480>.

Susanty AI, Yuningsih Y, Anggadwita G (2019). Knowledge management practices and innovation performance. *J Sci Technol Policy Manag* 10(2):301–318. <https://doi.org/10.1108/JSTPM-03-2018-0030>

Yang, M., Luu, T. T., & Qian, D. (2021). Dual-focused transformational leadership and service innovation in hospitality organizations: A multilevel investigation. *International Journal of Hospitality Management*, 98, 103035.

Wang, J., & Wang, Z. (2020). Strengths, weaknesses, opportunities, and threats (Swot) analysis of China's prevention and control strategy for the COVID-19 epidemic. *International Journal of Environmental Research and Public Health*, 17(7). <https://doi.org/10.3390/ijerph17072235>.

Wu J and Gu Y (2022) Innovation capabilities in the convergence trend of higher education from the perspective of quality management. Front. Psychol. 13:979059. doi: 10.3389/fpsyg.2022.979059

Zhao, Y., & Wang, X. (2020). Organizational unlearning, relearning, and strategic flexibility: from the perspective of updating routines and knowledge. *Technology Analysis & Strategic Management*, 32(11), 1251–1263.

Zutshi A, Creed A, Bhattacharya A, Bavik A, Sohal A, Bavik YL (2021). Demystifying knowledge hiding in academic roles in higher education. *J Bus Res* 137:206–221. <https://doi.org/10.1016/j.jbusres.2021.08.030>.

Copyrights

Copyright for this article is retained by the author(s), with first publication rights granted to the journal.

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>)