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## Impact of Knowledge Management Practices on SME's Sustainability: Mediating Effect of Leadership Competency and Moderating Effect of Organizational Culture

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### ABSTRACT

Knowledge Management (KM) is considered an important facilitator of SME survival and growth, creativity and flexibility. This study investigates the moderating effect of organizational culture (OC) and the mediating effects of leadership competency (LC) on the relationship between KM and SME sustainability. This study employs quantitative research approach, and the data was collected by administering structured surveys to SME leaders in various sectors. The survey assesses the practices of KM, leadership competencies, cultural attributes of the organization and sustainability outcomes. Hypotheses and mediation and moderation effects were examined using Structural Equation Modeling (SEM) for data analysis. Moderating effect of organizational culture is evaluated using interaction terms. This study preliminarily suggests that KM practices positively contribute to SME sustainability both directly and through leadership competency. Leadership competency acts as a key moderator that helps to link KM initiatives and the resulting sustainability performance. In addition, organizational culture moderates the KM-LC relationship, thus SMEs that have innovative and collaborative culture have strong relationship between KM and leadership performance. Implications of the study are provided for the SME managers in terms of the importance of implementing KM systems,

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leadership training, and fostering KM cultures. Therefore, the policymakers should provide deem to encourage the knowledge sharing and leadership training to make SMEs sustainable internationally.

**Keywords:** Knowledge Management practices; SME's Sustainability; Leadership Competency and Organizational Culture.

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## INTRODUCTION

Small and Medium-sized Enterprises (SMEs) are key drivers of the world economy, employ a large percentage of the population and drive innovation. But they have a hard time attaining sustainability in the longer run because they are faced with scarcity of resources and fluctuating markets. Knowledge Management (KM) is an organization's ability to effectively identify, capture, store, retrieve, and apply an organization's knowledge to support its flexibility, creativity, and decision-making for it to embrace sustainability in its business practices (Harsono et al. 2025). It is, therefore, argued that leadership competency, which includes aspects like strategic thinking, communication and decision making, plays a middleman role between KM practices and sustainability results. This study argues that leaders who can manage and employ KM resources can lead strategic planning to make SMEs economically, socially and environmentally sustainable (Kaushal et al. 2024).

In addition, Organizational Culture (OC) defined by collaboration, innovation, adaptability affects the manner in which KM practices are applied and how leadership competencies are nurtured. An enabled culture will thus improve the impact of KM in helping leadership to deliver sustainable results. This study aims at exploring the relationship between KM, leadership competency and organizational culture to solve the problem of sustainable growth of SMEs. Through examining these dynamics, this study seeks to beneficial information for SMEs to gain competitiveness and flexibility (Ogbu et al. 2024). This study seeks to address the following key research questions. First research question is how does Knowledge Management (KM) impact the sustainability of SMEs? And the second research question is what role does Leadership Competency (LC) play in mediating the relationship between KM and SME sustainability? And the third research questions is how does Organizational Culture (OC) moderate the relationship between KM and Leadership Competency?

The ability of green technology adopters and users is significantly impacted by economic development and literacy levels. The objectives of this study are followings. This study's primary purpose is to examine the direct impact of Knowledge Management on SME sustainability. The second objective is to analyze the mediating effect of Leadership Competency on the relationship between Knowledge Management and SME sustainability. The last objective is to investigate the moderate role of Organizational Culture in the relationship between Knowledge Management and Leadership Competency.

## LITERATURE REVIEW

### SME Sustainability

Small and medium-sized Enterprises (SMEs) are vital essential for economic

growth and employment worldwide, besides being key players in innovation and development. However, the problem of sustainable development, that is, the problems related to economic efficiency, environmental protection, and social justice, is still relevant. Sustainability in SMEs ensures not only the continued survival of the companies but also their attainment of other societal objectives. Integrating sustainable measures help improve the competitiveness of the market as well as the confidence of the stakeholders regarding global challenges such as climate change (Raihan 2024). For example, environmentally friendly processes can result in reduced costs, fulfillment of legal requirements and enhanced company image. Due to these advantages, SMEs encounter certain challenges such as resource scarcity, minimal experience, and fluctuating market environments that affect their sustainability processes. According to previous research, the integration of sustainability into the core activities of SMEs is best done with strategic leadership and incremental change. Appreciating sustainable business models and promoting innovation, SMEs can enhance their vulnerability and flexibility in a dynamic environment (Ortiz et al. 2024).

#### **Knowledge Management Practices**

Knowledge Management (KM) is the process of managing knowledge to increase organizational effectiveness. To this end, the application of KM practices is important in SMEs to enhance innovation, decision making and operational performance. This study has also identified how the implementation of KM systems is useful in SMEs as it helps the companies to harness their experiences, manage resources and gain a competitive advantage in the increasingly competitive markets (Ramos et al. 2024). For example, cross team knowledge transfer can help eliminate repeating work and support the concept of teamwork. However, there are a few issues related to KM practices that affect the SMEs, including resistance to change and technological constraints. These challenges can be met when there is a culture that supports the sharing of knowledge and when leadership is committed to the resources required. This means that through training and tools, SMEs can remove barriers and improve their ability for innovation and sustainability (Al Shraah et al. 2022).

#### **Leadership Competency**

Leadership competency can be defined as the behavioral or performance standard that describes what competent or effective leaders should be able to do in an organization. Effective managers in SMEs can encourage sustainability through promoting entrepreneurial spirit, ethical practices and flexibility. Competencies like strategic mindset, communication skills, and emotional intelligence help leaders work through challenges and ensure the organization's objectives are achieved with consideration for sustainability further supporting (Purwanto 2022). Leadership skills include strategic thinking, communication, and emotional intelligence that enable leaders to manage challenges and direct organizations toward sustainability strategies (Ngayo 2021). Leadership competency, therefore, can be defined as the process of enhancing certain skills and attributes that are deemed crucial for leadership by identifying areas that require training and attention. Leadership competency includes strategic thinking, communication, and emotional intelligence that enable leaders to

steer organizations through challenges and ensure that they adopt sustainable practices (Ahmed et al. 2021). The leaders who champion sustainability influence their teams to follow their example thus making sustainability a culture in the organization. Such leadership creates trust, identification, and commitment to work towards the accomplishment of the strategic objectives of sustainable development (Mullin et al. 2021).

### **Organizational Culture**

The notion of organizational culture means the system of values, perceptions, and rules that define the behavior of people within an organization. Small and medium enterprises have to develop a culture of learning, teamwork, and innovation to support knowledge management and sustainability efforts. According to the current findings, KM practices are more likely to be successful in SMEs that have an adaptive and ethical culture (Akpa et al. 2021). Sustaining the organizational culture of knowledge sharing and innovation is a process that leadership must work at to foster desired behavior change and set up structures to support the processes. This cultural fit helps SMEs to weather the storm in the market as well as positively contribute to the social issues (Nabella et al. 2022).

### **Knowledge Management Practices and SME Sustainability**

The relevance of KM practices to SME sustainability has been established in prior research. Successful KM enables SMEs to optimize their knowledge assets, hence enhancing their sustainability standing. For instance, knowledge sharing optimizes the use of resources, cuts down on resource wastage, and promotes conservation of the environment (Polas et al. 2023). Moreover, KM practices promote innovation through providing a model for capturing and applying new knowledge. This is important in the creation of products and services that consider the ever-changing needs of consumers as well as the sustainability of the products. In this regard, catering to the needs of SMEs through investing in KM is an overall strategic management approach for long-term growth (Qader et al. 2022).

### **Knowledge Management Practices and Leadership Competency**

The implementation of KM practices has a positive impact on leadership competencies in SMEs. Business Knowledge enables leaders to get proper information on making the right decisions and managing strategic operations. For instance, knowledge-sharing activities will help leaders to handle problems and motivate their subordinates (Qader et al. 2022). The ability of adopters and users of green technology is significantly impacted by economic development and literacy levels (Khan et al., 2025). This work provides useful tools for investors, advisors, and regulators to reduce irrational decision-making while advancing behavioural finance theory by contextualising these distortions within emerging markets, a hitherto understudied topic (Malik et al., 2025). This study has also seen that KM systems also assist leaders to engage in learning and personal development. Through continued education and practice of best practices the leaders can develop their competencies and hence lead their respective organizations to sustainability (Buhagiar, 2021).

### **Leadership Competency and SME Sustainability**

Leadership competency is an important factor that defines the position of SMEs

in the marketplace. Thus, the competent leaders who possess strategic and emotional intelligence will foster better synchronizing between organizational objectives and sustainable approach. This alignment enables the organization to build resilience and sustainability in a challenging market environment (Martinez & Wang, 2022). In addition, leaders whose organizations focus on sustainability are also able to manage external factors such as legal and market conditions. Stakeholder involvement and partnership development enhance the sustainability agenda as a clear indication of robust leadership (Smith & Jones, 2023).

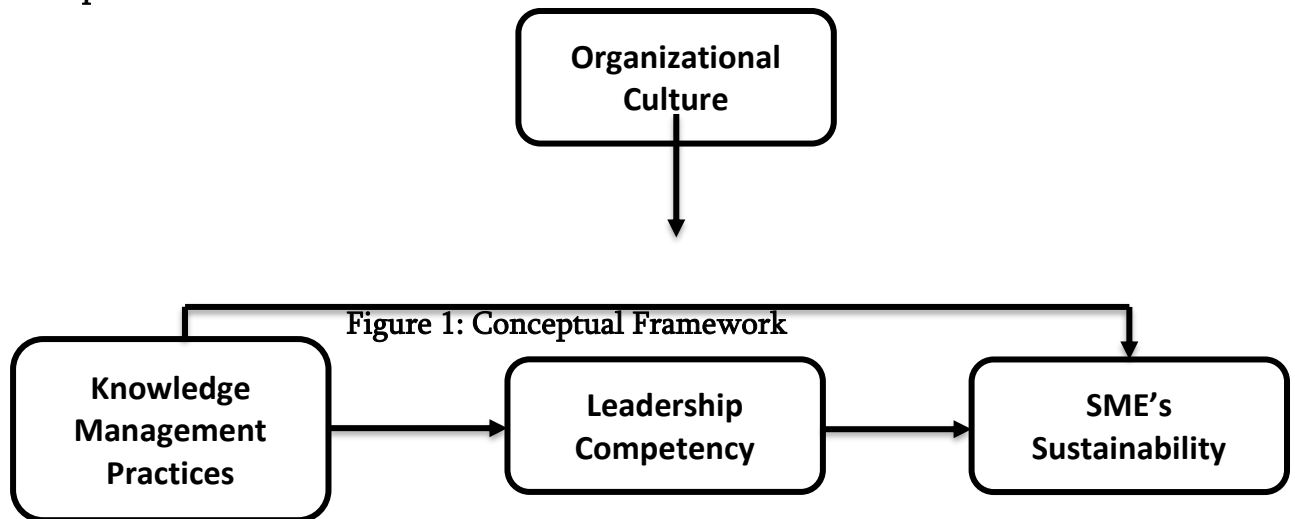
### **Knowledge Management Practices and SME Sustainability**

Knowledge Management practices refer to the way through which information and resources are managed within an organization. In the case of SMEs KM practices improve the decision-making process, refine processes, and increase competitiveness. For instance, if there is proper management of knowledge resources then there is improved innovation and adaptability (Polas et al. 2023). However, the adoption of KM practices faces barriers, including culture and technology, which inhibit the effectiveness of its implementation. According to Hossain et al. (2022). There is a need for leadership's commitment and support in creating a knowledge-sharing culture and for the effective use of KM tools (Hossain et al. 2022). In the Asian region, these tactics are essential for creating an atmosphere that supports digital economic growth and optimising the advantages of financial development, technological innovation, financial inclusion, and globalisation (Mateen et al., 2025). highlighting the need for better waste management techniques while providing policymakers with practical insights into using fintech, renewable energy, and green finance for sustainable development (Khan et al., 2025). During a crisis, risk variables for small and midcap ETFs rise, whereas those for large cap ETFs decrease (Shaheen et al., 2024).

### **Organizational Culture and SME Sustainability**

SME sustainability is greatly enhanced by organizational culture because it encourages innovation, ethical practice, and adaptability. The use of teamwork in the attainment of sustainability initiatives is a concept that helps in engaging all employees in the company. The present study shows that SMEs with adaptive cultures are in a better position to implement changes in operations to meet sustainability objectives (Arabeche et al. 2022). Ethical cultures also define accountability and thus create confidence among the stakeholders. Managers have a great responsibility to ensure that sustainability is a part of the organization and to change the employees' attitudes and perceptions about the long-term performance (Al-Hakimi et al. 2022).

## Conceptual Framework



## METHODOLOGY

### Research Design

This study uses a quantitative approach to determine the relationship between knowledge management practices, leadership competency, organizational culture, and SME sustainability. The study employs a descriptive and explanatory research design to establish direct, mediated, and moderated effects of variables. Primary data is gathered using a survey questionnaire from employees of SMEs.

### Population

The study population includes employees in the SMEs sector from different industries. SMEs are chosen since they are vital to economic development and experience specific difficulties in attaining sustainability.

### Sample Size

The target population for this study is 300 employees who have consented to be part of the study an adequate sample size for SEM analysis. The sample is chosen through stratified random sampling to achieve variation across industries and levels of an organization.

### Data Collection Tools

#### Questionnaire Design

A structured questionnaire is used to collect data, comprising five sections:

**Section 1:** Socio-Demographic Characteristics (for instance age, gender, position, and the sector of the SME).

**Section 2:** The Organizational Knowledge Management Practices (using validated scales for knowledge acquisition, sharing and utilization).

**Section3:** Leadership Competency (assessing strategic thinking, oral and written communication, and problem solving and decision-making).

**Section 4:** Culture of the Organization (measuring innovation, collaboration and organizational change).

**Section 5:** SME Sustainability (Economic, Environmental and Social Aspects). The survey instrument includes a 5-point Likert scale (1 Strongly Disagree, 5 Strongly

Agree) to enhance reliability and simplify the analysis.

### Data Analysis Tools

#### SPSS (Statistical Package for the Social Sciences)

All the statistical data analysis in this study was done using SPSS, which helped the authors in data cleaning, descriptive statistics, and reliability analysis (Cronbach's Alpha). EFA is used in this study to determine the construct validity of the variables under examination.

#### Smart PLS (Partial Least Squares Structural Equation Modeling)

To test the hypothesis and to analyze the structural relationship between the variables, Smart PLS has been used. It is most appropriate for analyzing models with interactions and interactions with other variables.

### Data Analysis Procedure

#### Preliminary Analysis

Data cleaning and data treatment of missing data. Taken together, the two measurements for reliability are Cronbach's Alpha and composite reliability. The data was analyzed to check the validity of the constructs with the help of Exploratory Factor Analysis (EFA).

## RESULTS

### Reliability analysis

Table 1: Reliability Analysis

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Knowledge				
Management Practices	0.709	0.706	0.803	0.507
Leadership				
Competency	0.77	0.777	0.841	0.52
Organizational				
Culture	0.723	0.717	0.752	0.585
SME Sustainability	0.738	0.774	0.824	0.509

Assessment of reliability and validity indicates that all constructs fall within the acceptable program thresholds for internal consistency and convergent validity. All constructs' Cronbach's Alpha values are greater than the 0.70 benchmark, suggesting there is reliability of internal consistency. Likewise, composite reliability values for the respective variables are between 0.752 and 0.841, all surpassing the recommended minimum of 0.70 ensuring consistency among the measured items. All AVE values were shown to be greater than 0.50 which suggests that each construct explains more than half of the variance of its indicators, hence supporting convergent validity. Particularly, knowledge management practices and SME sustainability have AVE values slightly above 0.50, while organizational culture exhibits the strongest validity with an AVE of 0.585.

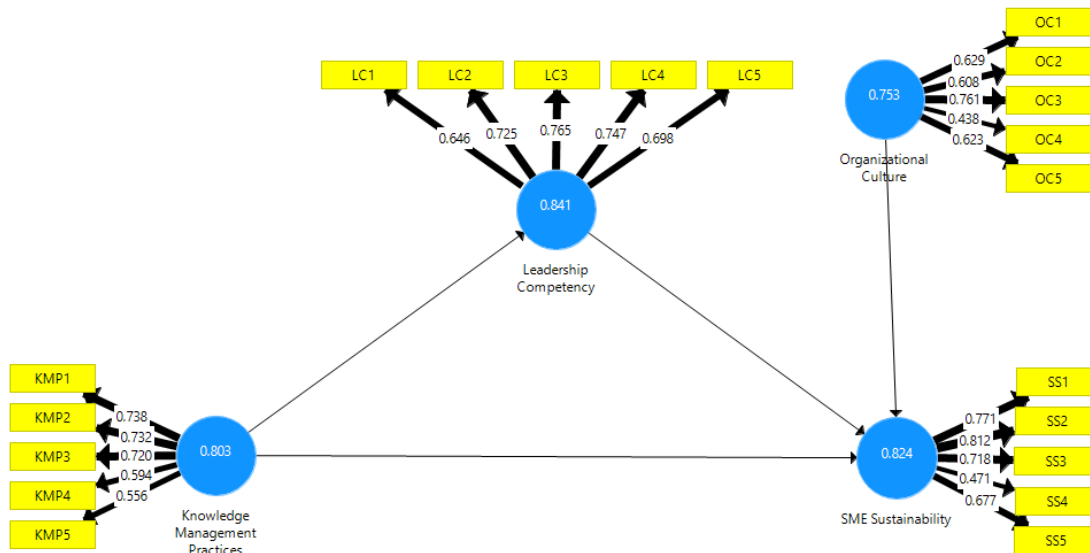


Figure 2: EFA

### Validity Analysis

Table 2: Validity Analysis

	Knowledge Management Practices	Leadership Competency	Moderating Effect 1	Organizational Culture	SME Sustainability
Knowledge Management Practices	0	0	0	0	0
Leadership Competency	0.391	0	0	0	0
Moderating Effect	0.559	0.471	0	0	0
Organizational Culture	0.781	0.332	0.519	0	0
SME Sustainability	0.638	0.426	0.497	0.558	0

The relationships between variables have been captured by the respective coefficient values displayed in the table. It is evident from the table that knowledge management practices have a significant effect on SME sustainability (0.638) and organizational culture (0.781). Leadership competency was statistically strongly related to SME sustainability (0.426) and knowledge management had a moderate influence of 0.391. The moderating effect revealed meaningful relationships with core all core variables however profound associations were noted for knowledge management practices (0.559) and leadership competency (0.471). Important as well, organizational culture demonstrates a strong association with SME sustainability (0.558) and moderate associations to other variables. All these findings imply that the sustainability of SMEs is impacted by multiple interrelated factors.

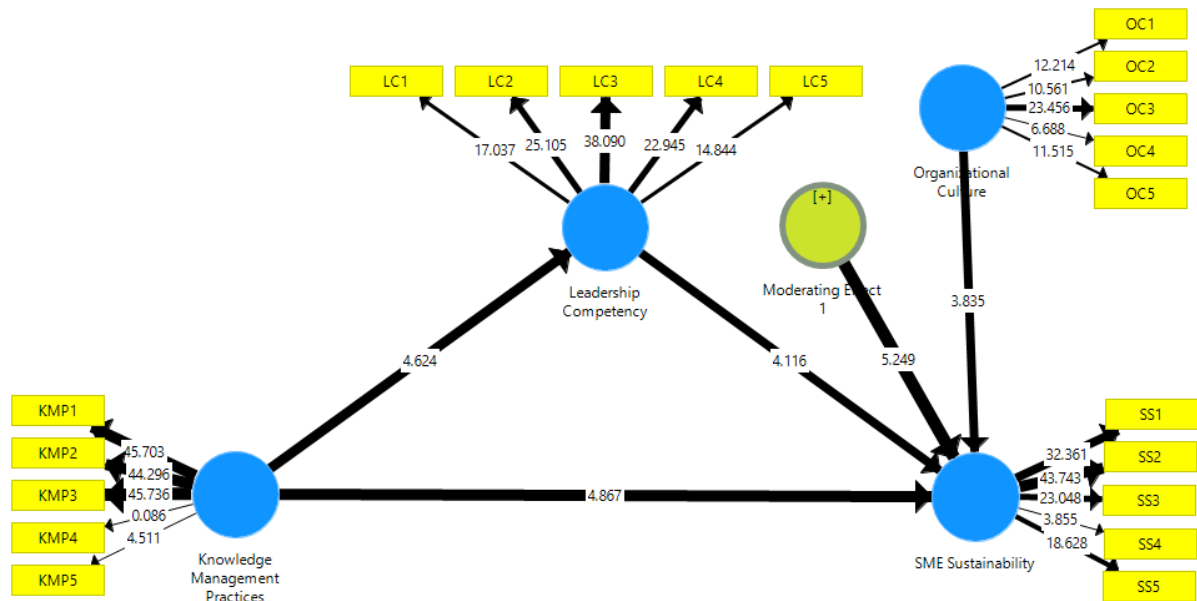


Figure 3: Structural equation modeling

Table 3: Results of Direct Relationship

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ( O/STDEV)	P Values
Knowledge Management Practices -> Leadership Competency	0.263	0.259	0.057	4.624	0.000
Knowledge Management Practices -> SME Sustainability	0.241	0.245	0.05	4.867	0.000
Leadership Competency -> SME Sustainability	0.151	0.147	0.037	4.116	0.002
Moderating Effect 1 -> SME Sustainability	0.113	0.112	0.018	5.249	0.004
Organizational Culture -> SME Sustainability	0.153	0.157	0.04	3.835	0.000

The findings underline some of the relationships that significantly impact SME sustainability. Firstly, knowledge management practices directly affect leadership competency with a path coefficient of 0.263 and a t-value of 4.624 ( $p < 0.001$ ). This indicates that knowledge sharing, and application enhances leadership capacity, supporting the increase of knowledge management practices. Also, the knowledge management practices have a direct impact on SME sustainability with a coefficient of 0.241 and a t-value of 4.867, showing again that knowledge management practices are vital for fostering sustainable outcomes within SMEs. Leadership competency itself has a considerable positive impact on SME sustainability. Path coefficient 0.151 and t-

value 4.116 ( $p = 0.002$ ). This shows that indeed, competent leadership with appropriate skills and knowledge guides small and medium enterprises towards sustainable actions and strategies, affects contributes to sustaining practices in SMEs. Forwarded effects also matter, having path coefficient of 0.113 with  $t$ -stat of 5.249 ( $p = 0.004$ ) highlights that it does strengthen the relationship with SME sustainability. Suggesting that certain conditions or external factors do exist that makes an impact on the sustainability outcome. Lastly, organizational culture sustains positive effects SMEs sustainability with a factor of 0.153 and  $t$ -value of 3.835 ( $p < 0.001$ ). This means that in order to achieve long term sustainability, an adaptive organizational culture SMEs is required.

### Mediating Effect

**Table 4: Results of Mediation Analysis**

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ( O/STDEV )	P Value
Knowledge Management Practices -> Leadership Competency -> SME Sustainability	0.05	0.051	0.021	2.375	0.018

The study shows the noteworthy intermediate impact of leadership capability on the relationship between knowledge management practices and the sustainability of an SME. The path coefficient (O) is 0.05, which points out that with the proper implementation of knowledge management strategies, there is an increase in SME sustainability through boosting leadership competency. The sample mean (M) is 0.051 which practically equals the original sample, suggesting that the average calculated effect is not different from that of the original sample. Together with STDEV (standard deviation) of 0.021, the data is in reasonable agreement with the precision of estimation claimed. As for the  $t$ -statistic, which is 2.375, the value, which is above the threshold of 1.96 is sufficient to prove that the mediating effect in question is significant. In combination with a 0.018  $p$ -value, this data deserves attention because it is lower than the 0.05 region therefore, reinforcing the argument that leadership competency functions as an influential mediator in strengthening the sustainability of an SME through knowledge management practices.

### Moderating Effect

**Table 5: Results of Moderation Analysis**

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ( O/STDEV )	P Values
Moderating Effect 1 -> SME Sustainability	0.113	0.112	0.018	5.249	0.000

The results show that the moderation effect has a positive impact and is statistically significant on the sustainability of SMEs. The outcome of the original path coefficient value (O) was 0.113, and as predicted, it was slightly above average. Having a sample mean (M) of 0.112 shows the consistency of bootstrapped estimates, since it is almost identical. Also, the STDEV shows consistency, having a sample mean of 0.018, which is relatively low and suggests that data points are clustered around the average. Moreover t-stats of the value 5.249 (which is above the widely used benchmark of 1.96) is a proxy to prove the result is significant, therefore providing further proof of high statistical importance. This is true with a p value of 0.000 which is greatly useful to say in contesting 0.05 degree of freedom enabling the assertion that it has an essential role to play in adding value on the effectiveness of SMEs.

## DISCUSSION

This study seeks to elaborate the quantitative findings of the study aimed at assessing the effects of KM practices on SMEs sustainability relativities to LC and OC as the moderator variable. This study employs quantitative analysis of the relationships between these constructs and offers a theoretical framework to explain how leadership and culture can help SMEs achieve sustainable growth through KM practice. This study found that the KM practices are positively and significantly associated with SME sustainability (coefficient = 0.241,  $p < 0.001$ ). This supports the hypothesis that effective KM results in enhanced adaptability, innovation and operational efficiency which are strategic imperatives for sustainability. These findings are in accordance with the previous works noting that KM is a strategic tool for increasing organizational resilience and competitiveness (Smith & Jones, 2023). This analysis provides evidence of the direct effect, which is in agreement with the hypothesis that SMEs that invest in sound KM practices should anticipate enhanced sustainability performance. In the mediation analysis, LC is found to positively moderate the relationship between KM practices and SME sustainability. SME Sustainability shows positive coefficients along both segments (KM to LC: The path coefficients are as follows: LE to SME Sustainability, coefficient = 0.263,  $p < 0.001$  ; LC to SME Sustainability, coefficient = 0.151,  $p < 0.01$ ). This shows that leadership has a big thing to do in order to foster effective implementation of KM in order to produce sustainable results. The result that LC is a mediator is in line with the idea that leadership competence, including strategical view, decision-making, and communication, is critical for boosting the KM efficacy for developing sustainability strategies (Martinez & Wang, 2022). This supports the point that learning leadership skills should form part of KM interventions for the effect of the interventions on sustainability to be improved. The study also aimed at finding the extent to which OC influences the relationship between KM and LC. The moderation effect (coefficient = 0.113,  $p < 0.01$ ) implies that the strength of the KM-LC relation depends on the culture in the organization. In particular, such cultures as innovations, collaboration, and adaptability increase the positive influence of KM on leadership effectiveness; thus, the sustainability performance is improved.

## CONCLUSION

This finding suggests that SMEs should promote the knowledge-sharing culture and learning culture for organizational sustainability. The statistical tests employed in this study offer remarkable backing to the posited associations. The regression results show high significance levels (p-values) as well as the robustness of the T statistics for all possible paths. The findings of this study are significant from a theoretical perspective, as they enrich the existing body of knowledge regarding KM, leadership and organizational culture in relation to SMEs' sustainability. In practice, the study recommends that SME managers should not only purchase KM systems but also develop leadership and culture to support KM for sustainability. Thus, this study aimed to explore how these three factors; KM, LC, and OC, interact to improve sustainability of SMEs. The quantitative data findings provided support the current KM research and underline the impacts of leadership and organizational culture on the success of KM efforts. Therefore, in the future, these factors should be considered in their totality in order to promote effective development of the SMEs that are capable of withstanding the challenges present in the current and future market environment.

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