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Influencing Factors and Challenges in Implementing Knowledge Management System in Higher Education: A Systematic Literature Review

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ABSTRACT

In the contemporary digital era, knowledge occupies a strategic position in supporting the performance and sustainability of higher education institutions. The implementation of Knowledge Management Systems (KMS) plays a pivotal role in driving innovation and enhancing operational efficiency, though it frequently encounters obstacles, including resistance to change and resource constraints. Existing research emphasizes that robust management support, a conducive organizational culture, adequate technological infrastructure, and individual capability development constitute critical success factors for KMS implementation. This research aims to identify common patterns and findings that provide insights into effective strategies for overcoming challenges and leveraging supporting factors in KMS implementation in the higher education sector. This study employs a systematic literature review methodology to collect, evaluate, and synthesize findings from relevant publications spanning 2019 to 2024. Through narrative analysis of 23 selected papers, this research identifies recurring patterns and themes concerning the influencing factors and challenges in implementing Knowledge Management System in higher education: a systematic literature review. The results of the analysis underline the importance of a comprehensive understanding of supporting factors and existing challenges, enabling higher education institutions to develop and implement effective knowledge management strategies. This aims to strengthen the innovation and competitiveness of higher education amid dynamic global competition. In conclusion, the adoption and implementation of targeted knowledge management strategies are considered crucial for optimizing innovative potential and improving higher education performance in the long term.

KEYWORDS *Knowledge Management System (KMS); Influencing Factors; Challenger; Higher Education*

INTRODUCTION

The global landscape of higher education has undergone profound transformation in the digital era, where knowledge has emerged as the most critical strategic asset for institutional excellence and sustainability (Kumari et al., 2023). In this context, the implementation of Knowledge Management Systems (KMS) represents not merely technological adoption but a fundamental organizational shift toward systematic knowledge creation, storage, dissemination, and utilization. Higher education institutions worldwide face mounting pressure to enhance research output, improve teaching quality, foster innovation, and maintain competitive advantage in an increasingly globalized academic marketplace. However, despite widespread recognition of KMS potential, many institutions encounter significant implementation challenges that impede their knowledge management capabilities.

The literature reveals a persistent gap between the theoretical benefits of KMS and practical implementation outcomes in higher education settings. While several studies have examined individual aspects of KMS adoption—such as technological infrastructure (Zahrawi, 2019) or organizational culture (Cheng, 2021)—there remains limited comprehensive understanding of how multiple factors interact to influence implementation success or failure.

Furthermore, the COVID-19 pandemic has fundamentally altered knowledge management practices in higher education, accelerating digital transformation while simultaneously exposing critical vulnerabilities in existing systems (Kazemian & Grant, 2024). This unprecedented disruption underscores the urgent need for systematic examination of both enabling factors and implementation barriers in contemporary higher education contexts.

Previous research has established that top management support, supportive organizational culture, and adequate technological infrastructure constitute essential prerequisites for successful KMS implementation (Sahibzada & Mumtaz, 2023). Secundo et al. (2019) demonstrated that entrepreneurial universities with innovation-oriented cultures achieved significantly higher KMS adoption rates. Meanwhile, Abdullah et al. (2022) identified financial support and management commitment as critical determinants of implementation outcomes in developing-country contexts. Additionally, barriers—including resistance to change, resource scarcity, and communication obstacles—frequently emerge during implementation processes (Rafi et al., 2022), creating substantial challenges for institutional stakeholders.

The novelty of this research lies in its comprehensive, systematic synthesis of influencing factors and challenges across diverse higher education contexts during the post-pandemic period (2019–2024). Unlike previous studies that typically focus on single institutions or specific dimensions, this systematic literature review provides a holistic framework identifying patterns, relationships, and emerging trends in KMS implementation. By integrating findings from 23 peer-reviewed studies across multiple databases, this research offers unique insights into the interplay between technological, organizational, cultural, and strategic factors that shape implementation outcomes.

This study addresses three fundamental research questions: First, what are the factors that influence the implementation of Knowledge Management Systems in higher education environments? Second, what are the specific challenges faced in implementing KMS within academic institutions? Third, how is the implementation of KMS in the education sector actually carried out across different institutional contexts? Through addressing these questions, this research aims to provide actionable insights for educational administrators, policymakers, and technology implementers seeking to optimize knowledge management capabilities.

Through in-depth analysis, this research identifies common patterns and findings that offer insights into effective strategies for overcoming challenges and leveraging supporting factors in KMS implementation in the higher education sector. By understanding the influencing factors and challenges in implementing KMS, universities can design and implement more effective strategies to utilize knowledge as a strategic resource. This will ultimately strengthen the innovation and competitive capacity of universities in facing dynamic global challenges.

METHOD

This Systematic Literature Review (SLR) employed the Kitchenham methodology (Kitchenham, 2014; Kitchenham & Charters, 2007) to systematically identify, evaluate, and synthesize evidence regarding success factors and challenges in implementing Knowledge Management Systems (KMS) in higher education. This qualitative research approach utilized

comprehensive literature mapping to critically analyze factors influencing KMS implementation across diverse institutional contexts.

The research design incorporated three sequential stages prescribed by the Kitchenham method: planning, implementation, and reporting. This rigorous approach ensured methodological transparency, replicability, and systematic bias minimization throughout the review process. The study specifically focused on peer-reviewed academic publications from the period 2019–2024, capturing contemporary developments including post-pandemic transformations in knowledge management practices.

The Kitchenham method comprised three stages for conducting a literature review: planning, implementation, and reporting.

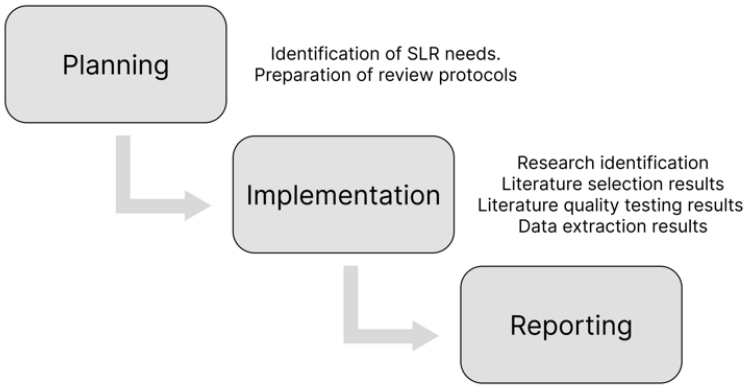

Figure 1. Methodology Systematic Literature Review

Planning

During the planning stage, the research framework was established through several critical steps. First, the research background was articulated, identifying the knowledge gap in comprehensive understanding of KMS implementation factors across higher education contexts. Second, the PICOC (Population, Intervention, Comparison, Outcome, and Context) framework was formulated to precisely define the review scope and ensure focused literature selection. Third, specific research questions were developed to guide the investigation. Finally, inclusion and exclusion criteria were established to maintain methodological rigor in paper selection and quality assessment.

Table 1. PICOC Formula

Population	Higher Education Academic Portal users involved in implementing the Knowledge Management System (KMS).
Intervention	Implementation of a Knowledge Management System in Higher Education Academic Portals.
Comparison	-
Outcome	Evaluation of the effectiveness of the Knowledge Management System is related to the influence of KMS in the tertiary environment and the challenges faced in implementing KMS in tertiary institutions.
Context	The research context includes the university academic environment.

Based on the PICOC formula as previously mentioned, we formulated keywords for database searches. a literature search will then be carried out based on the keywords that have been determined. Where the search string is as follows:

("Knowledge Management Systems" OR "KMS") AND ("Higher Education" OR "College") AND ("Implementing" OR "Implementation").

Five major academic databases were selected for comprehensive literature coverage: Scopus, Emerald Insight, IEEE Xplore, ACM Digital Library, and Web of Science. These databases were chosen based on their extensive coverage of educational technology, information systems, and higher education research domains, ensuring broad representation of relevant scholarly publications.

Subsequently, rigorous inclusion and exclusion criteria were formulated to guide systematic paper selection, as detailed in Table 2. These criteria were applied progressively across multiple screening stages to ensure only high-quality, relevant studies were included in the final analysis.

Table 2. Inclusion and Exclusion Criteria

Step	Criteria Inclusion	Criteria Exclusion
Initiation Stage	- Matches with search keywords - English - Publication year 2019-2024	- Languages other of English - Year of publication excluding 2019-2024
Stage 1 (Title and abstract selection)	- Discussing KM - Research in higher education	- Papers that discuss other than the topic of Knowledge Management - Duplicate paper - Review paper
Stage 2 (full-text selection)	Open access paper	- Paper doesn't have full text

After the selection process of titles, abstracts, and full texts, the next step involved quality assessment, which comprised eight quality indicators. A threshold value of 5 was set for the quality assessment. Hence, papers scoring below 5 were eliminated from further consideration. This rigorous quality evaluation ensured that only studies meeting the predefined quality standards were included in our analysis, thereby enhancing the reliability and robustness of our research findings.

Implementation

The implementation stage operationalized the selection protocol established during planning through four sequential screening steps: Initiation Stage, Title and Abstract Selection, Full-text Selection, and Quality Assessment. This systematic process ensured transparent, replicable paper selection while minimizing selection bias.

At the Initiation Stage, database searches were executed using the predetermined search string across all five databases. Initial results underwent automated filtering based on publication year (2019-2024) and language (English only). During Title and Abstract Selection, two independent reviewers evaluated each paper's relevance to the research questions, with disagreements resolved through discussion and, when necessary, third-party arbitration. The Full-text Selection stage involved comprehensive reading of remaining papers to verify alignment with inclusion criteria and research objectives. Finally, Quality Assessment applied the eight-indicator framework to ensure methodological rigor and substantive contribution of included studies.

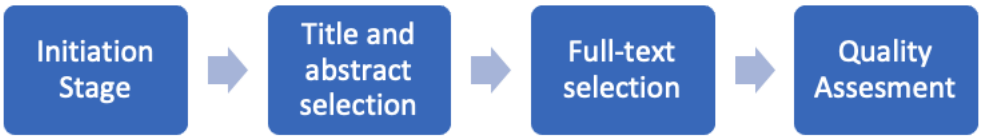

Figure 2. Papers Screening Steps

Reporting

The reporting stage involved systematic data extraction and narrative synthesis from the final paper set. Following Kitchenham's guidelines (Kitchenham, B., & Charters, 2007), comprehensive data extraction templates were developed to capture: (1) study characteristics (authors, year, location, methodology), (2) implementation factors identified, (3) challenges reported, (4) implementation approaches described, and (5) key findings and recommendations. This structured extraction facilitated systematic comparison and pattern identification across studies.

Narrative synthesis was employed as the primary analytical approach, appropriate for integrating findings from diverse methodological approaches and contexts. The synthesis process involved: (1) coding factors and challenges into preliminary categories, (2) identifying recurring themes and patterns across studies, (3) developing a comprehensive taxonomy of implementation factors and challenges, (4) examining relationships between different factors and implementation outcomes, and (5) comparing findings with existing theoretical frameworks in technology adoption and knowledge management literature.

The synthesis emphasizes both convergence (widely reported factors and challenges) and divergence (contextual variations and contradictory findings) in the literature. Particular attention was devoted to identifying gaps, inconsistencies, and areas requiring further investigation. The final report presents findings organized around the three research questions, providing clear summaries of identified patterns, trends, and relationships between factors, challenges, and implementation approaches. All assertions are substantiated with appropriate citations, and the report maintains methodological transparency by clearly documenting the review process, decisions made, and limitations encountered. As recommended by Kitchenham, this research is presented with clarity, conciseness, and complete referencing to enable critical appraisal and future research building upon these findings.

RESULT AND DISCUSSION

After conducting database searches and undergoing several selection and quality assessment steps, a total of 23 final papers were obtained, as depicted in Figure 3. These papers represent the culmination of our systematic process, ensuring that only the most relevant and high-quality research contributions are included in our study.

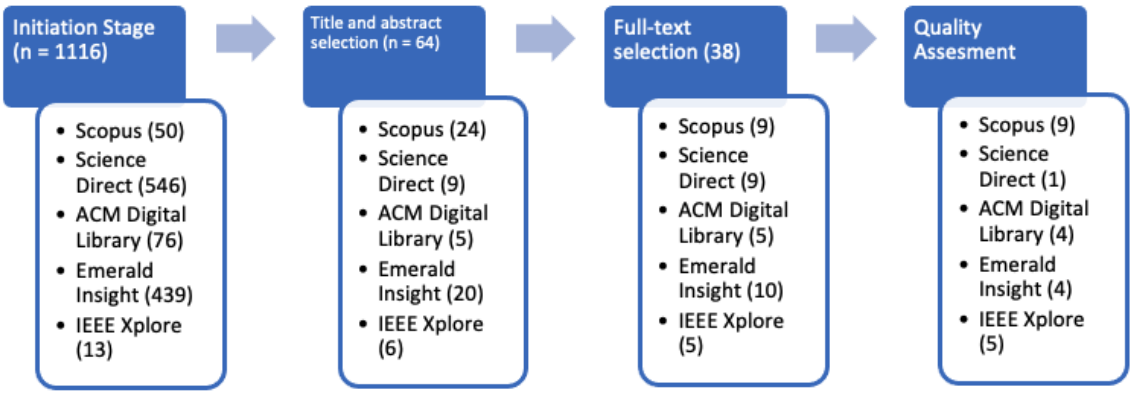

Figure 3. Paper Results Every Steps

The years 2022 and 2023 marked a significant peak in research activity within the realm of Knowledge Management Systems (KMS) in higher education, as depicted in Figure 4. Scholars and researchers delved deeply into understanding the intricacies and implications of KMS within academic settings during this period. This surge in scholarly interest underscores the growing recognition of KMS as a pivotal tool for enhancing knowledge dissemination, collaboration, and innovation within higher education institutions.

The trends shown in Figure 4 highlight the concentrated effort of researchers to address the evolving challenges and opportunities in higher education. The significant number of publications in 2022 and 2023 reflects not only an increased academic interest but also a response to the growing reliance on digital platforms post-pandemic. These findings emphasize the need for further exploration of how these trends influence the practical implementation of KMS.

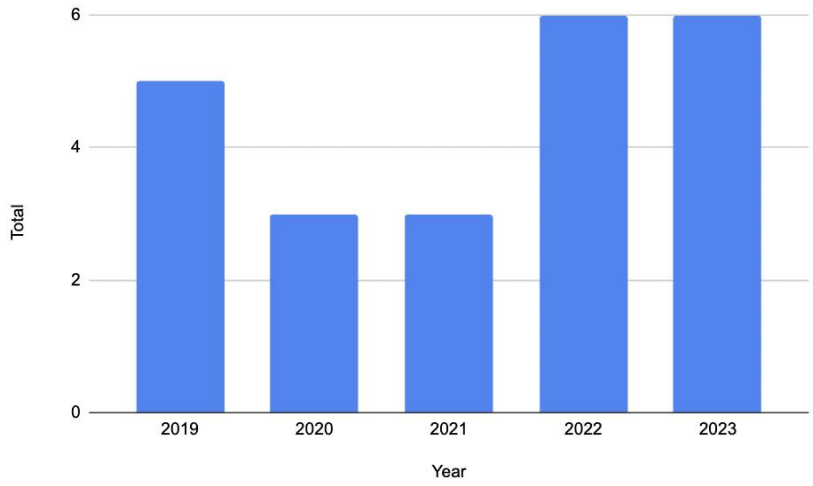

Figure 4. Paper Publication Year

The subsequent section outlines the distribution of methodologies employed, with a notable dominance of mixed methods, as depicted in Figure 5. This choice reflects a comprehensive approach to data collection and analysis, integrating both quantitative and qualitative techniques. Mixed methods provide researchers with the versatility to capture a more holistic understanding of the phenomenon under investigation, allowing for nuanced insights and enriched findings. The integration of methodology ensures a balanced analysis,

where qualitative findings enhance the depth of quantitative data, and quantitative results validate the generalizability of qualitative insights.

With the dominance of mixed methods in the literature reviewed, it is increasingly clear that this approach can strengthen the analysis, both in terms of scope and depth. Quantitative data provide an overview of the trends and prevalence of factors, while qualitative data provide an in-depth explanation of the context and dynamics behind the findings. Therefore, the presence of many mixed-method studies in this area confirms that the various factors influencing KMS implementation will be increasingly visible and more relevant to be applied in various contexts.

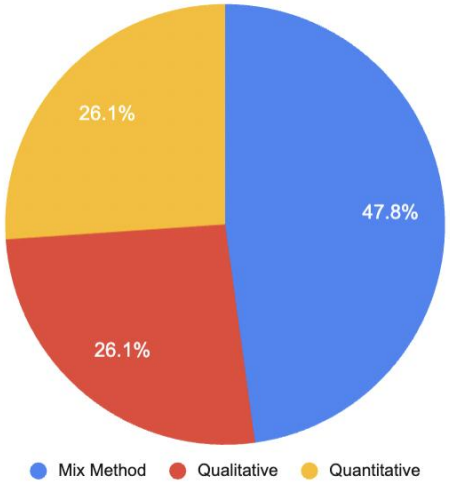

Figure 5. Methodology of paper

Publication trends related to Knowledge Management Systems (KMS) in higher education research indicate that the majority of relevant articles are published through Scopus, accounting for 39.1% of the total publications in Figure 6. This finding highlights the significance of Scopus as a key platform for disseminating research in this field.

The dominance of Scopus in the publication landscape suggests that research on KMS is gaining visibility in highly reputable academic circles. This visibility not only amplifies the impact of the studies but also highlights the importance of maintaining high methodological standards to meet the rigorous requirements of such platforms. For example, the high percentage of Scopus-indexed publications indicates a broader reach and influence, emphasizing the global relevance of research findings in shaping educational policies and practices.

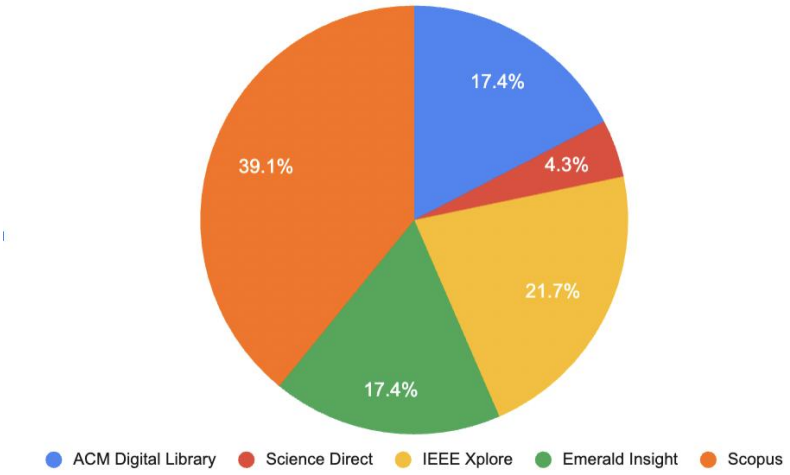

Figure 6. Database resource

The subsequent section of the research article delves into the findings that address Research Questions 1 through 3 (RQ1-RQ3). Through meticulous analysis and interpretation of the data collected, these findings illuminate various facets of the research inquiry.

RQ1. What are the factors that influence the implementation of a Knowledge Management System in a higher education environment?

Table 3. Influencing Factors for KMS Implementation in Higher Education

No	Dimensions	Key Factors	References
1	Technology and Infrastructure	Quality of e-learning content	(Alsharidah & Newbury, 2023; Sardjono & Firdaus, 2020)
		Ease of use of technology	(V. Rampisela et al., 2020)
		ICT as the main tool in the distribution and use of knowledge	(Escorcia Guzman et al., 2022)
		Technology integration learning	(Asalla et al., 2023; Menkhoff & Lydia Teo, 2022)
		Adequate IT infrastructure	(Abdullah et al., 2022; Alsharidah & Newbury, 2023; Asalla et al., 2023; Dneprovskaya & Shevtsova, 2023; D. H. Galeon & Palaoag, 2020; Hakiman et al., 2019; Prabowo et al., 2019; Sahibzada & Mumtaz, 2023; Zahrawi, 2019)
2	Management Policy and Support	The need for effective KM policies	(Hidayat et al., 2023)
		Top management support	(Abdullah et al., 2022; Cheng, 2021; Dneprovskaya & Shevtsova, 2023; Prabowo et al., 2019; Secundo et al., 2019; Zahrawi, 2019)
		Financial Support	(Abdullah et al., 2022)
		Top management awareness of the importance of knowledge management	(Sahibzada & Mumtaz, 2023)
3	Organizational culture	Knowledge sharing culture	(Asalla et al., 2023; Cheng, 2021; Dneprovskaya & Shevtsova, 2023; D. H. Galeon & Palaoag, 2020; Hakiman et al., 2019; Iqbal, 2021; Khabarov & Volegzhanina, 2022; Sahibzada & Mumtaz, 2023; Zahrawi, 2019)
		Innovative organizational culture	(Secundo et al., 2019)

No	Dimensions	Key Factors	References
		Effective knowledge management system	(Secundo et al., 2019)
4	Implementation Strategy	The need for a framework in planning effective KMS implementation	(Hussein et al., 2023)
		The need for a comprehensive KM model to support implementation	(Hidayat & Sensuse, 2022)
		Supporting quality of human resources	(D. H. Galeon & Palaoag, 2020; Hakiman et al., 2019)
		Effective KMS implementation knowledge management strategy	(D. Galeon, 2022; Hidayat et al., 2023)

RQ2. What are the challenges faced in implementing the Knowledge Management System in higher education?

Table 4. Challenges in Implementing KMS in Higher Education

No	Dimensions	Challenges	References
1	Resistance and Adaptation	Resistance to technological change	(Abdullah et al., 2022; Alsharidah & Newbury, 2023; Galgotia & Lakshmi, 2021; Hussein et al., 2023; Prabowo et al., 2019; Sahibzada & Mumtaz, 2023; Secundo et al., 2019)
		Stakeholder adaptation to the KMS system	(D. Galeon, 2022)
2	Technology and Infrastructure	Limited technical abilities of students	(V. Rampisela et al., 2020)
		Ensure system security	(Sardjono & Firdaus, 2020)
		Improve IT infrastructure	(Sardjono & Firdaus, 2020)
		Difficulty in managing and processing large amounts of data	(Kunthi & Sensuse, 2019; Obionwu et al., 2022)
3	Management and Evaluation	Non-optimality in KMS management	(Hidayat et al., 2023; Hidayat & Sensuse, 2022)
		Ensure proper KM investment	(Zahrawi, 2019)
		Addressing the issue of inappropriate use of KMS	(Zahrawi, 2019)
4	System Development	Develop content and structure that appeals to participants	(Menkhoff & Lydia Teo, 2022)
		Improved user interface design	(Alsharidah & Newbury, 2023; Escorcia Guzman et al., 2022; Hidayat et al., 2023)
		System performance and responsiveness	(Hidayat et al., 2023)
		Lack of documentation on the system	(Hidayat et al., 2023)
		Ensure full integration of ICT in knowledge management	(Escorcia Guzman et al., 2022; Sahibzada & Mumtaz, 2023)
		The need for integration of explicit and tactile knowledge	(Hidayat et al., 2023)
5	Engagement and Collaboration	Maintain participant involvement in the KMS environment	(V. Rampisela et al., 2020)
		Increase networking and collaboration activities	(Hakiman et al., 2019)

No	Dimensions	Challenges	References
		Integrate modern KM technology	(Hakiman et al., 2019)
6	Human Resources	Limited user technical capabilities	(V. Rampisela et al., 2020)
		Building a habit of sharing knowledge within companies and organizations	(Asalla et al., 2023; Dneprovskaya & Shevtsova, 2023; D. H. Galeon & Palaoag, 2020)
		Lack of educator training	(D. Galeon, 2022)

RQ3. How is the implementation of Knowledge Management Systems (KMS) in the education sector implemented?

Table 5. Knowledge Management Systems (KMS) in education sector

No	Implementation Sector	Description	References
1	Enhanced Learning and Personalization	The implementation of Knowledge Management Systems (KMS) in various sectors aims to enrich the learning experience through personalization and a more adaptive approach. Knowledge-based chatbots are used to support self-directed learning and provide content tailored to individual needs. KMS facilitates effective knowledge sharing between learners, encouraging innovation and deeper understanding. The existence of artificial intelligence (AI) and related technologies increases student interaction with learning materials, making the learning experience more interactive and engaging.	(Asalla et al., 2023; Galgotia & Lakshmi, 2021; V. Rampisela et al., 2020)
2	Collaboration and Innovation	In this category, KMS is used to strengthen collaboration between students, teachers, and researchers. Tools such as Electronic Learning Systems (ELS) and collaborative educational blogs enable the exchange of knowledge and experience, encouraging broader discussions and joint problem solving. The integration of knowledge management practices into academic activities supports innovation and increases efficiency in research and educational administration.	(Menkhoff & Lydia Teo, 2022; Obionwu et al., 2022; Sahibzada & Mumtaz, 2023)
3	Management Efficiency and Effectiveness	This category includes the use of ICT and KM systems designed to improve operational efficiency and effectiveness in internal audits and administrative management in educational institutions. Information and communication technology is used to streamline processes and facilitate the management of knowledge resources, thereby enabling faster and more precise decision making.	(Escorcia Guzman et al., 2022; Kunthi & Sensuse, 2019)
4	Support for the Educational Process	The application of KMS here is aimed at supporting sustainable Outcome-Based Education (OBE) and the integration of knowledge in the curriculum. KMS facilitates the achievement of educational goals by ensuring that curriculum and research activities are designed to support innovation and entrepreneurship, as well as outcome-focused curriculum development.	(D. Galeon, 2022; Hakiman et al., 2019; Secundo et al., 2019)

No	Implementation Sector	Description	References
5	Increased Access and Dissemination of Knowledge	In this context, KMS is directed at expanding access to knowledge resources and facilitating their dissemination among the academic community. This system enables students and researchers to obtain the latest and relevant information, supporting intelligent learning and effective research. AI and KM-based solutions are specifically aimed at providing customized knowledge services, improving the quality and relevance of learning materials.	(Dneprovskaya & Shevtsova, 2023; Galgotia & Lakshmi, 2021; Hidayat et al., 2023)
6	Implementation Strategy and Technology Readiness	The focus of this category is on developing effective KMS implementation strategies, including improving individual readiness and technology infrastructure, as well as developing an organizational culture that supports knowledge management. The KMS readiness model is used to plan and execute strategies that enable smooth KMS adoption, ensuring that all stakeholders are involved and support the initiative.	(Prabowo et al., 2019; Sardjono & Firdaus, 2020)

The implementation of the Knowledge Management System (KMS) in higher education has identified various factors that influence its successful implementation, including technological and infrastructure aspects, management policies and support, organizational culture, and effective implementation strategies. The results of this analysis indicate that the successful integration of KMS in higher education depends not only on the use of advanced tools and technologies, but also on the extent to which the institution can instill a culture of sharing and innovation, develop supportive policies, and ensure strong management support. Furthermore, challenges such as resistance to change, data security, and user engagement require innovative and adaptive solutions, underscoring the importance of a comprehensive and responsive implementation strategy.

The importance of these factors in the successful implementation of KMS in higher education opens opportunities for future research. One promising area is the development of detailed influence models, which can map the complex relationships between these factors and their impact on KMS effectiveness. Such models can help stakeholders in higher education to better understand how these factors interact with each other and influence the success of KMS, enabling them to design more effective implementation strategies. Future research could also explore the specific influence of each factor in different contexts, such as differences between large and small educational institutions, or comparisons between higher education institutions in developing and developed countries.

CONCLUSION

Implementing a Knowledge Management System (KMS) in higher education demands a comprehensive, integrated approach that combines robust technology and infrastructure with progressive policies, strong management support, and an innovation-friendly organizational culture to foster knowledge sharing. These interrelated factors require strategic management to address challenges like resistance to change, data security, and the creation of relevant educational content, while building human capacity through training, cross-disciplinary

collaboration, and embedding KMS in campus operations for a dynamic learning environment that boosts research innovation and operational efficiency. Institutions embracing KMS with stakeholder commitment—in human resources, technology, and teaching processes—can produce quality graduates, promote research, and maintain global leadership amid evolving educational dynamics. For future research, scholars should conduct longitudinal case studies in diverse developing-country contexts to empirically test KMS implementation frameworks post-2024, evaluating long-term impacts on institutional sustainability and student outcomes.

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