

Artificial Intelligence and Knowledge Management: Towards an Innovative Model in Higher Education

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Abstract:

This study aimed to explore the role of artificial intelligence in applying knowledge management in higher education, Artificial intelligence offers significant opportunities to enhance knowledge management in higher education by improving the collection, analysis, and dissemination of information. It plays a crucial role in customizing academic content to meet the specific needs of students and faculty members. Furthermore, AI contributes to optimizing administrative processes through the automation of routine tasks and the provision of data-driven decision support systems, thereby increasing the overall efficiency of educational institutions.

Despite the many advantages of this technology, the application of artificial intelligence in knowledge management faces challenges related to organization and governance, which requires adopting balanced strategies that combine innovation and effective guidance to ensure that it is maximized in the development of the higher education system.

Keywords: Artificial Intelligence; Knowledge Management; Higher Education.

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1. INTRODUCTION

In the era of advanced technology and digital transformation, artificial intelligence has become one of the basic tools that are reshaping various sectors, including the higher education sector. With the increasing volume of knowledge and the rapidity of information flows, knowledge management has become a key challenge for academic institutions. Here comes the role of artificial intelligence as a driving force for developing new methods for managing knowledge effectively, as we find that researchers have emphasized the integration of knowledge processes with strategic management. The impetus for researchers to connect knowledge with management stems from the vast quantities of information, necessitating the development of specific strategies for information governance.

AI provides intelligent solutions for organizing, storing, and retrieving knowledge, helping universities and research centers make the most of available information. It also allows educational content to be customized according to the needs of students and faculty, which contributes to enhancing the learning experience and providing a more interactive and productive academic environment. Supporting academic research and promoting innovation are key factors in improving the quality of education.

In this context, this study aims to explore how artificial intelligence can be employed in knowledge management within higher education institutions, and analyze its impact, while highlighting the challenges and opportunities that arise from this digital transformation, as well as future trends.

Therefore, we raise the following problem:

How is artificial intelligence used in knowledge management within higher education institutions?

For this study, we adopted a multi-faceted research approach to study the role of artificial intelligence in applying knowledge management in higher education, in order to achieve a comprehensive and in-depth analysis of the issue, which is a descriptive and analytical approach so that we can study the phenomenon as it actually is, where information is collected and

analyzed to understand the application of artificial intelligence in knowledge management within higher education institutions, and to assess its impact on educational and administrative processes.

The importance of the study:

Studying the role of artificial intelligence in applying knowledge management in higher education is gaining great importance for several reasons, including:

- Improving the quality of education: AI contributes to the development of advanced teaching strategies based on data analysis and content customization according to students' needs, enhancing the quality of the educational process.
- Supporting scientific research: AI technologies provide sophisticated analysis tools that enable researchers to process big data and extract knowledge in a more efficient and accurate way.
- Facilitating access to knowledge: Through artificial intelligence, students and faculty members can access information easily and quickly via intelligent search systems and digital content management.
- Preparing academic institutions for the future: Understanding the applications of artificial intelligence in knowledge management helps universities adopt advanced technological solutions that ensure the sustainability of their ability to innovate and adapt to future developments.

Therefore, studying this topic provides valuable insights into how to make the most of artificial intelligence to enhance higher education and achieve effective digital transformation within academic institutions.

Study objectives:

Studying the role of artificial intelligence in applying knowledge management in higher education seeks to achieve a set of important goals that contribute to improving the educational process and enhancing the efficiency of academic institutions. Among these goals:

- Analyzing the impact of artificial intelligence on knowledge management by studying how to employ artificial intelligence

techniques in organizing, storing, and retrieving knowledge within higher education institutions.

- Identifying challenges and opportunities: analyzing potential obstacles to the application of artificial intelligence in knowledge management within higher education, and exploring solutions and strategies to maximize its benefits.
- The study aims to provide a comprehensive vision on the importance of artificial intelligence in developing higher education, and to support innovation in knowledge management within academic institutions.

2. Basic concepts:

2.1 Definition of artificial intelligence:

Artificial intelligence is one of the branches of computer science and one of the basic pillars on which the technology industry is based in the current era, which is referred to by the abbreviation AI.

John McCarthy, who first coined the term 'artificial intelligence,' defined it as a method for enabling computers, computer-controlled robots, or programs to exhibit intelligent thought processes akin to those of humans. Artificial intelligence is achieved by studying how the human brain thinks, and how humans learn. They decide and work while trying to solve a problem, then use the results of this study as a basis for developing smart programs and systems. ¹

Artificial intelligence usually refers to the artificial fabrication of human minds that can learn, plan, perceive, or process natural language.

Russell and Norvig summarize the definition of artificial intelligence into four categories based on two dimensions: the inference dimension, ..i.e., the behavioral dimension and human performance, and the rationality dimension. These categories are:

- Systems that think like humans.
- Systems that behave like humans.
- Systems that think with reason and intention
- Systems that act rationally.

Artificial intelligence systems must have the following capabilities: natural

language processing to communicate in a natural language, knowledge representation to store information, and automated thinking by using stored information to answer questions and draw new conclusions.²

In general, artificial intelligence can be defined as the set of efforts made to develop computerized information systems in a way that they can act and think in a way like humans. These systems can learn natural languages, demonstrating the capacity for machines to act in a human-like manner.

2.2 Definition of knowledge management:

Knowledge management is defined as the process of identifying, creating, acquiring, sharing, and transferring organizational knowledge to employees who require it for effective and efficient work, leveraging modern capabilities and information technology to the fullest extent possible.³

The University of Texas defined it as an organized process of searching for information, organizing it, classifying it in a way that increases the worker's understanding of it, and storing it in a way that improves the organization's level of intelligence, provides it with the necessary flexibility in work, preserves intellectual assets from loss, and facilitates the process of benefiting from them. In solving business problems.⁴

The intellectual roots of knowledge management go back to philosophical thinking on the one hand and to the focus on the requirements of experience in the workplace, and some roots on the other hand came through the different perspectives of business leaders and their learning.⁵

Hence, all institutions must work to stimulate individuals' creative energies, enhance competitiveness, arm themselves with a culture of creativity, development, and team performance, and provide a learning opportunity for employees in order to develop their skills and information. Within knowledge management, visions and experiences shape knowledge, which is embodied either in individuals or in organizational operations, thereby fostering a deeper understanding.

3. The relationship between artificial intelligence and knowledge management.

Artificial intelligence and knowledge management are related to the way in which artificial intelligence fundamentally enhances the efficiency and effectiveness of knowledge management, because knowledge management often involves numerous manual and repetitive tasks,⁶ To illustrate the importance of knowledge management, we mention the following:

- Knowledge management presents a significant opportunity to reduce costs and enhance internal efforts to foster innovation.
- It is an integrative solidarity process to coordinate the organization's various activities in the direction of achieving its goals.
- Enhancing the organization's ability to maintain organizational performance based on knowledge and improvement.
- Knowledge management is a tool for active organizations to invest their intellectual capital, by making access to the knowledge generated by it for other people who need it an easy and possible process.
- Facing unstable environmental changes.
- It contributes to motivating organizations to renew themselves and retain expertise, experience and skills.⁷
- Knowing the keys to building the institution, which gives its intrinsic value.
- Reducing communication gaps between experts and new employees within the organization.⁸

Artificial intelligence not only automates these tasks but also adds many complex functions.

Artificial Intelligence has taken its place as an irreplaceable tool in knowledge management thanks to its speed, analytical power, predictive capabilities, enhanced reach, and self-improvement nature. Accordingly, artificial intelligence has rapidly developed as a cornerstone in the field of knowledge management.

The importance of artificial intelligence in knowledge management lies in its ability to process and analyze large amounts of data more than

human capabilities through its speed, accuracy and predictive capabilities, which strengthen organizations to identify and use the accurate insights hidden in their data, and lead to more informed and strategic decisions.

Likewise, artificial intelligence facilitates enhanced access to information, to ensure that the right knowledge is delivered to the right people at the right time. The symbiosis between artificial intelligence and knowledge management not only ensures effective data management, but also creates an environment that promotes innovation, appropriate decision-making, and a deeper understanding of internal processes and dynamics. External market.⁹

4. Applications of artificial intelligence in higher education.

Artificial intelligence is among the issues that concern all social and economic sectors, including the field of education.

Artificial intelligence brings a radical change to the field of education. We will witness a revolution affecting tools, ways of learning, use of knowledge, and the process of preparing teachers.

Artificial intelligence can help accelerate the process of achieving global education goals by reducing barriers to learning, automating administrative procedures, and providing the best ways to improve learning outcomes.¹⁰

Artificial intelligence contributes to improving the quality of higher education and providing personalized educational experiences for students, which are:

- Adaptive Learning: AI systems are used to analyze student performance and adapt educational content to suit their individual needs.
- Educational Robotics: AI-powered robots are being used to deliver interactive lessons and assist students in understanding challenging concepts.
- Student Assessment: AI algorithms are used to automatically assess student performance and provide instant feedback.
- For instance, AI can be used in case studies to customize the learning experience for each student and provide course recommendations tailored to their interests and proficiency levels.¹¹

Artificial intelligence is a rapidly evolving field that encompasses a range of technologies, including machine learning, natural language processing, and robotics. In higher education, AI has the potential to revolutionize the way we teach and learn, from personalized learning experiences to automated grading and assessment. AI can also help educators identify and address student needs, foster collaboration and communication, and provide valuable insights into student performance and engagement.

One of the main advantages of AI in higher education is its ability to adapt to individual learning styles and preferences. With AI-powered learning platforms, students can receive personalized feedback, recommendations, and resources based on their unique needs and interests. This can lead to more effective learning outcomes and greater student engagement. AI can also help teachers manage the increasing demands of an increasingly diverse student population by automating routine tasks, thereby allowing more time for meaningful interactions with students¹².

Hence, it can be said that artificial intelligence contributes significantly to improving knowledge management in higher education by enhancing cognitive processes and making them more efficient and effective.

5. How is artificial intelligence used in knowledge management in higher education.

Knowledge management is a key feature of contemporary administrative development. It encourages individuals within an organization to contribute their ideas and expertise to address challenges and enhance the organization's standing. This process includes generating knowledge, which involves presenting topic-related ideas, followed by storing, organizing, sharing, applying, and re-evaluating both positive and negative outcomes.

As for the quality of higher education, it is an effective gateway to constantly improving the educational process and advancing it globally on the one hand, and achieving student and community satisfaction on the other hand. This requires providing a number of elements, the most

important of which are: planning, institutional commitment, providing an appropriate university environment, hearing student complaints, and supporting services. Provided, educating the student, and evaluating the student to determine his ability to perform during his studies and after his graduation in the manner he planned In light of this, it became clear to us that there is a close relationship between knowledge management processes and the quality of higher education because the two variables are based on each other. In clearer terms, knowledge needs quality and quality needs knowledge.¹³

To achieve this quality in higher education, if knowledge management must be devoted, we summarize the uses of artificial intelligence in knowledge management as follows:

- AI-driven information processing: AI can extract key insights from documents, emails, and even multimedia content, meeting summaries, or photos and makes the information searchable and usable.
- Understanding natural language to organize knowledge: that is, natural language processing (NLP) It makes AI able to understand the context of documents and conversations can automatically classify and tag content, making it easier for employees to find relevant information without knowing exactly what to look for.
- Machine learning to enhance knowledge: Artificial intelligence constantly improves knowledge bases by identifying trends and patterns. It can detect gaps in documentation, suggest updates, and highlight the most valuable content to employees.
- Knowledge Graph Integration: By drawing relationships between different pieces of information, the AI-powered knowledge graph helps companies connect relevant content across multiple platforms. This makes it easier for employees to discover relevant knowledge, even if they don't know where to look¹⁴.

Artificial Intelligence can bring many advantages to business. Let's delve deeper into the advantages of AI-based knowledge management.

Artificial Intelligence and Knowledge Management: Towards an Innovative Model in Higher Education

- AI-powered tools allow organizations to make more data-driven decisions, and AI-driven knowledge management software can analyze complex scenarios, provide suggestions, and enhance decision-making.

- Cost Savings: As mentioned earlier, knowledge management can be very iterative. By implementing AI-based systems, you can automate routine tasks, resulting in reduced operating costs and better resource allocation.

- With the ability of artificial intelligence to process a large amount of data very quickly, it can facilitate the knowledge management process as a whole, making it more efficient and less susceptible to human error.

- Artificial intelligence can participate in a large proportion of innovation within organizations by analyzing data in the knowledge base and providing improvements tailored to the company's needs. This not only simplifies the innovation process, but also ensures that the proposed changes are relevant and beneficial to higher education.¹⁵

- Improving access to information: Employees spend a large part of their time looking for information - whether it be company policies, project documentation, or subject matter expertise. AI-powered knowledge management systems eliminate these drawbacks by providing intelligent research and personalized recommendations.

- Rather than relying on manual tagging or rigid folder structures, AI understands the context of queries and retrieves the most relevant information, even when employees don't know which keywords to use.

- Additionally, AI-driven systems can proactively explore knowledge where and when employees need it. For example, an AI can suggest relevant documentation while a customer support agent handles a ticket or recommend training materials to a new employee based on their role.

- By deconstructing the information chapters and ensuring knowledge is always at hand, AI dramatically reduces time wasted due to repetitive questions and inefficient search.

- Improving the quality of knowledge: Keeping knowledge accurate and up to date is a constant challenge, especially as organizations grow and information changes frequently. AI helps maintain a high and reliable

quality of knowledge by automating content verification and highlighting outdated or duplicate information.

- Operational efficiency: AI-powered knowledge management significantly boosts productivity by automating repetitive tasks and streamlining knowledge sharing processes. Instead of manually organizing, updating, and distributing knowledge, AI automates these processes, allowing employees to focus on higher-value tasks.

- Helps more efficiently by eliminating repetitive searches and frequent questions. Its AI-powered search, content recommendations, and real-time knowledge verification ensure that employees always get access to the most accurate and up-to-date information - within their workflow.

- In the process of hiring and training employees, AI can provide personalized learning paths by suggesting the most relevant materials based on the employee's role and progress. This speeds up the learning curve for new employees and reduces the burden on HR and training teams.¹⁶

6. Potential challenges of artificial intelligence in knowledge management.

Like any innovative and powerful system, using generative AI in knowledge management does not come without a natural set of challenges. Let's discuss more challenges to this.

- Technical Complexities: While generative AI has the potential to significantly enhance knowledge management processes, the complex nature of AI technologies can present challenges to organizations. Some of those common challenges are complex application, integration with existing systems, data quality and accuracy, and even resource-intensive needs. Although AI-based solutions are not a completely standalone system, they are still quite complex and require a high level of expertise.
- Privacy and data security concerns: Artificial intelligence systems often need access to a large amount of data, which may increase security and privacy concerns. For example, an artificial intelligence system used to manage knowledge in quality care would need access to sensitive patient data. If this data is not well secured, it may be vulnerable to

breaches, which could lead to serious legal consequences and negative reputational impacts.

- Over-reliance on AI systems may undermine human judgment and reduce critical oversight, particularly in scenarios where intuition and context-specific decision-making are vital.
- For example, if a company relies solely on an artificial intelligence system to manage knowledge, important ideas that require human intuition and experience may be ignored. In addition, if the AI system fails or makes a mistake, the company may not have an alternative plan available.¹⁷
- Data quality and integration issues: AI is based on high-quality, well-structured data. Organizations often struggle with fragmented or outdated information, making it necessary to clean and organize data before implementing AI.
- Obstacles to implementation: Introducing AI into knowledge management requires the right infrastructure, staff training, and a well-thought-out change management strategy.¹⁸

7. Future trends in artificial intelligence for knowledge management in higher education.

AI in knowledge management is evolving rapidly, with advances that make information more accessible, intelligent, and personalized. Emerging trends such as multi-paradigm AI, predictive knowledge delivery, and human-AI collaboration are expected to transform how higher education institutions capture and use knowledge. Future innovations include:

- Multi-model AI systems that process text, images and sound simultaneously.
- Extended truth interfaces for immersive knowledge exploration.
- Quantum computing applications for complex knowledge analysis.
- Symbolic AI to enhance thinking and decision-making.

AI is also shifting from passive storage to active knowledge creation, offering personalization insights before employees look for them. As AI continues to advance, educational institutions adopting these technologies

will have a significant advantage in managing and exploiting their knowledge¹⁹.

Reports, such as Gartner 2023, have shown that AI applications may improve the efficiency of cognitive processes by 40%. A 2022 McKinsey study also showed that organizations implementing AI-powered knowledge management increased their productivity by 20%.

While the study also reviewed the benefits of integrating AI into knowledge management, such as supporting innovation, organizations implementing AI achieved a 25% increase in innovation, according to Harvard Business Review 2020.

Studies in 2022 found that 72% of organizations that use artificial intelligence achieved better results in decision-making. On the other hand, despite these benefits that we saw previously, organizations face challenges in integrating artificial intelligence, such as resistance to change and weak infrastructure. A study conducted in 2023 confirmed that artificial intelligence contributes to achieving organizations' strategic goals by enhancing cognitive processes and supporting knowledge-based decisions in innovative work environments²⁰.

8. CONCLUSION

From the above, we can say that knowledge management is the strategic efforts of higher education through which it seeks to achieve competitive advantage by collecting and investing its intellectual assets, improving the various practices of working individuals and making optimal use of the information contained in its databases, which leads to quality performance.

AI is revolutionizing knowledge management, making it easier for organizations to access and use information effectively. By implementing AI-powered tools, organizations can improve efficiency, enhance decision-making, and ensure that employees always have the knowledge they need.

Overall, the role of AI in knowledge management is to drive transformative insights that can help organizations stay competitive in today's fast-paced business environment. By harnessing the power of AI technologies, organizations can unleash the full potential of their data,

improve decision-making processes, and drive innovation in all areas of their operations. As AI continues to evolve and advance, its impact on knowledge management is expected to grow, making it an essential tool for organizations looking to thrive in the digital age.

Thanks to its many applications, artificial intelligence is a key component in developing and managing knowledge in higher education. By facilitating access to information and promoting collaboration and knowledge sharing, AI can contribute to improving the quality of education and the overall learning experience.

Therefore, higher education is a beacon of scientific creativity and the most important means of progress and advancement of societies. Universities cannot turn into rigid organizations that do not seek development and modernization. Rather, they must always strive to adopt development initiatives to raise their levels of performance and achieve continuous improvement in order to renew their roles and increase their levels of internal efficiency and external.

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