ISSN 2959-6149

A Literature Review of the Research on Digital Management in Higher Education

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Abstract:

Digital management holds significant importance in higher education, especially in cultivating digital literacy personnel. The theoretical foundation of digital management encompasses various domains, such as information science, management studies, and education. In practice, digital management has achieved notable results in teaching, research, and administrative management. Scholars have proposed strategies to address challenges like information security and data sharing. The future development trends of digital management in higher education distinctly point towards intelligence and personalization, aiming to significantly enhance management efficiency and promote equitable distribution of educational resources through technological innovation. However, a major challenge currently faced in this research area is insufficient diversity exploration. Therefore, future studies must expand both breadth and depth.

Keywords: Higher Education; Digital Management; Research Review; Information Technology

1. Introduction

Digitalization represents a process that transforms complex and dynamic information into quantifiable and analyzable data. The underlying policy aims to cultivate talents equipped with digital literacy and capabilities. Digital management entails employing advanced digital technologies to achieve intelligent and refined management strategies. This policy emphasizes a "digital ecosystem characterized by co-construction, co-governance, and sharing." It seeks to leverage the construction of digital governance to enhance the development of the digital economy and society, thereby promoting an overall improvement in Digital China through a cooperative and shared framework. In this context, attention must be paid to fostering a vibrant and open digital ecosystem, particularly within urban, rural, and grassroots community platforms, as well as across sectors like healthcare, social security, and employment, to create comprehensive and integrated management services that are intelligent and refined. "In the field of education, digitalization can be understood as a straightforward evolutionary process that enables schools to manage efficiently and effectively."[]

Digital management in higher education serves as a specific application of digital management practices within this sector. It encompasses various aspects. First, it requires fostering a digital mindset and cultivating talent with digital literacy and skills. Next, it emphasizes building digital platforms to provide advanced technological support for educational administration. Furthermore, it aims to enhance digital governance capabilities and levels, achieving intelligent and refined educational management. Finally, "innovators should create digital evaluation systems to ensure the scientific and effective nature of educational administration"[]. Throughout this process, digital management in higher education must prioritize innovative educational management concepts, focus on digital thinking, and emphasize service tailored to needs along with human-computer collaboration. It should expand the content of educational management, strengthen data governance, environmental reconstruction, and institutional design. Additionally, optimizing the organizational structure of educational management is crucial; adopting a matrix organizational structure and treating projects as new governance units while establishing dedicated digital management institutions is essential. Through these measures, digital management in higher education will significantly support the modernization of education, promote educational equity, and enhance educational quality.

2. The Current Research Status of Digital Management in Higher Education

This study focuses on the significant issue of "Digital Management in Higher Education." It aims to explore its theoretical foundations, practical applications, current challenges, and future directions. Through a comprehensive search of the CNKI and WOS (Web of Science) databases, we identified 46 relevant publications. After rigor-

ous selection and evaluation, we narrowed it down to 18 articles that demonstrate considerable academic value and practical relevance. Most of these publications appeared in 2023 and 2024, highlighting the latest research findings and trends in the field of digital management in higher education. Additionally, some articles date back over a decade, offering valuable historical context and theoretical underpinnings. This context aids our understanding of the evolution and patterns of digital management in higher education. From an academic perspective, we can categorize and summarize these publications into five main areas: theoretical foundations, practical applications, challenges and strategies, future development, and specific management content.

2.1 Research on the Theoretical Foundations of Higher Education Digital Management

From an interdisciplinary research perspective, scholars in fields such as information science, management, and education collaboratively explore the core concepts of digitization and its application in higher education management. They clearly indicate that the fundamental idea of digitization involves leveraging cutting-edge digital technologies, such as artificial intelligence, cloud computing, and blockchain, to deeply analyze and excavate existing data to create and extract new value. This concept not only drives innovation in information technology but also brings profound transformations to the management of higher education.

From the perspective of information science, the digital management of higher education relies heavily on information technology as its core support. By optimizing management processes and enhancing efficiency, it serves as a crucial pathway to achieve modernization in university administration. Through the integration of advanced information systems, universities can monitor various management data in real-time, enabling precise decision-making and effective execution, thereby elevating the overall management standard.

From an educational perspective, "digital management has profoundly impacted teaching methods and instructional formats"[]. Teaching approaches have shifted from traditional rote knowledge transfer to interactive learning, placing greater emphasis on student participation and experience. Instructional formats have also transitioned from fixed classroom lectures to the dissemination of knowledge through cloud-based platforms, breaking the constraints of time and space. This evolution not only enhances the quality of education but also fosters a smarter and more efficient learning environment for students."Changes in environment, means, and strategies have facilitated the high-quality development of higher education."[]

In the interdisciplinary study of education and management, scholars highlight "the necessity of redesigning relevant systems within the context of smart education". []They argue that sound system design serves as a critical guarantee for advancing smart education. With the introduction of digital management methods, higher education management needs to adjust and refine existing institutional frameworks to meet new management demands and technological environments. Research indicates that not only "does the digital innovation of higher education management correlate positively with the cultivation of student quality, fostering holistic development"[], but also "that effective management and maintenance of digital resource systems for teaching and learning can lead to more stable and efficient higher education management"[]. This underscores the significant value of digitization in higher education management.

2.2 Research on the Practical Application of Digital Management in Higher Education

In the scope of academic research application, digital management shows vast potential and far-reaching impact within university teaching management, research management, and administrative management.

First, in teaching management, scholars focus on strategies and practices for cultivating students' digital learning skills. The digital transformation significantly alters educational methods and approaches. It also profoundly affects educational philosophies, content, and methodologies. Studies indicate that digital transformation fosters personalized learning, enhances teaching efficiency and quality, and nurtures students' innovation and practical abilities. "The process of technological innovation promotes the usability of digital tools, which facilitate automated processes and provide new information systems to aid decision-making."[]

At the management level of scientific research, universities have established digital teaching platforms to achieve the sharing and optimization of educational resources. Furthermore, they employ digital tools for the management of research projects, which, through precise data analysis and efficient process management, significantly enhance research efficiency and quality.

In administrative management, digital tools play a crucial role. By integrating digital management systems, higher education institutions have achieved digital transformation and intelligence in administration. This advancement not only enhances management efficiency but also improves service quality and user experience. For instance, "By establishing a digital office platform, universities can streamline processes such as document handling, meeting scheduling, and personnel management, significantly

reducing labor and resource expenditure."[] Additionally, digital management allows universities to accurately monitor campus dynamics, respond swiftly to various emergencies, and ensure campus safety and stability.

2.3 Research on the Challenges and Countermeasures of Digital Management in Higher Education

"In an era marked by the deepening wave of digitalization, there arises an imperative for higher education administrators to demonstrate problem-solving skills and innovative capabilities."[] "Digital technology experts play a crucial role in the development of academic institutions."[] While higher education management enjoys the conveniences and efficiency gains brought by technological innovations, it also faces a myriad of significant challenges. These challenges not only pertain to the stability and efficient operation of the higher education management system but also directly impact the security of educational data, the protection of privacy, and the effective sharing of educational resources.

The contradiction between data sharing and privacy protection is an urgent issue that demands resolution in the construction of digital management within higher education. On one hand, to enhance the utilization efficiency of educational resources and promote educational equity, institutions must achieve data sharing. On the other hand, educational data contains a substantial amount of personal privacy information. Striking a balance between facilitating data sharing and safeguarding personal privacy presents a major challenge for institutions. Scholars argue that "a comprehensive mechanism for data sharing and privacy protection should be established, clearly defining the scope, methods, and conditions for data sharing, while also strengthening the application of privacy protection technologies such as data encryption and masking to ensure that personal privacy information remains secure."[]

The phenomenon of "data silos" is a critical issue that requires attention in the digital transformation of higher education management. Due to the absence of standardized data protocols and incompatible data interfaces across various departments and systems, a significant number of "data silos" exist within universities. This impairs the effective sharing and interchange of data between these silos, severely hindering the efficiency and quality of educational management. To address this challenge, scholars advocate for the unification of internal data standards and compatibility of data interfaces, alongside strengthening data integration and sharing across departments and systems, thereby dismantling "data silos" and achieving comprehensive and effective use of educational data.[]

In terms of formulating and implementing digital management strategies, the academic community generally acknowledges that the success of digital transformation in higher education hinges on the establishment and effective execution of management strategies. "The application of educational big data can reveal patterns of learning behavior, enhance teaching methods, and provide educators with the theoretical frameworks, methodologies, and tools necessary for effective design."[] These strategies encompass the strengthening of new infrastructure development, the digitalization of the classroom teaching process, and the cultivation of new competencies centered around digital capability. To ensure a smooth transformation, it is essential to establish a collaborative multi-departmental mechanism and a digital governance system to guarantee the effective execution of the strategies. Regarding challenges, while digital transformation presents numerous opportunities for higher education, it is also accompanied by challenges such as the deprofessionalization of knowledge and limited knowledge sources. Researchers have proposed various strategies for addressing these challenges, including leveraging empirical evidence to reinforce critical perspectives on knowledge management and assessing their validity.

2.4 Research on the Future Development of Digital Management in Higher Education

When examining the future trajectory of digital management in higher education, there is a broad consensus within the academic community that ongoing innovations and breakthroughs in technologies such as artificial intelligence and big data will increasingly lead to smart and personalized digital management solutions. This evolution will manifest not only in the automation of management processes and smart decision-making but also in the provision of more tailored and accurate learning support and services for students. This trend is expected to further intensify, with digital management in higher education playing a more pivotal role in enhancing institutional management efficiency, promoting educational equity, and optimizing the learning experience. "To adapt to the changes brought about by digital technologies, sustainable management has also become a focal point of concern."[]

Digital management in higher education has emerged as a critical direction for institutional reform. "Online education can better align with students' learning habits by offering flexible learning times, methods, and paces, thereby facilitating personalized instruction."[] This perspective strongly supports the personalized development of digital management in higher education. As technology continues to advance and application scenarios expand, the future of digital management in higher education will penetrate even deeper into all facets of university instruction, ulti-

mately providing students with a more diverse and individualized learning experience.

Collaborative management poses a significant challenge in the realm of digital management in higher education. The disparities in departmental functions and the independence of various digital systems result in isolated modules with limited collaborative functionality. "This fragmentation and isolation not only hamper management efficiency but also restrict the overall quality of higher education administration."[] Effectively integrating and managing these disparate systems will be crucial for the future development of digital management in higher education.

As the global trend of higher education becomes more prevalent and digitalization accelerates, countries are actively exploring pathways and strategies for the digital transformation of higher education. Comparative analysis across nations reveals a common trend in the widespread adoption of digital technologies. Additionally, the rise of online education platforms and the increasing significance of relationship-oriented leadership practices cannot be overlooked. "The implications of digital transformation technologies suggest that the importance of relationship-oriented leadership will grow, emphasizing the enhancement of current teaching methodologies and student learning potentials through controlled paradigms."[]

3. Conclusion and Discussion

The digital transformation of higher education is a pivotal topic in the global higher education landscape today. The research presented offers a comprehensive and in-depth perspective on the digital transformation of higher education, revealing not only the critical areas and common trends of transformation but also the impact it has on educational practices and the challenges faced. More importantly, the research equips us with strategies and directions to address these challenges, providing robust support and guidance for the digital transformation of higher education. To effectively advance this process and tackle accompanying challenges, formulating and implementing scientifically grounded management strategies is crucial. Additionally, focusing on and analyzing global trends and drawing lessons from the successful experiences of other countries and regions is vital for fostering the sustainable development of digital transformation in our country's higher education sector.

Digital management in higher education is progressively emerging as a significant trend in educational administration, driven by the integration of information technology, management studies, and educational theory. By thoroughly exploring and implementing digital technologies, optimizing management processes, enhancing institutional frameworks, and innovating teaching methodologies, digital management in higher education will create a superior learning environment and conditions for students, fostering the continuous advancement and development of higher education. The application of such digital management practices across various sectors, including academic teaching, research management, and administrative functions, not only enhances management efficiency and service quality but also offers students and educators a more enriching and productive experience. Looking ahead, with continual technological advancements and expanding application scenarios, digital management is poised to play an increasingly pivotal role in university administration. While challenges arise, they also present substantial opportunities for growth. Confronting these challenges head-on, actively responding to issues, and consistently innovating and refining the digital management systems and mechanisms are essential for promoting the healthy development of digital construction in educational management. The future landscape holds both opportunities and obstacles that, through measures such as strengthening technological research and development, facilitating system integration, and enhancing data governance and privacy protection, can catalyze the innovation and growth of digital management in higher education, heralding a brighter future for university administration.

However, the current research still has some shortcomings, such as insufficient diversity in the study subjects and a need for greater depth in the research content. Future studies could expand the scope and methodology, further exploring the intrinsic mechanisms and patterns of digital transformation in higher education to better inform practice and application.

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