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NEW ERA OF HIGHER EDUCATION: DIGITAL TRANSFORMATION AND INFORMATION SYSTEM MANAGEMENT

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ABSTRACT

This article aims to analyze digital transformation and the implementation of Management Information Systems (MIS) in higher education, particularly in the post-pandemic era. Through the Systematic Literature Review (SLR) method, the article reviews 15 relevant studies to understand the impact and challenges of technology implementation, such as Enterprise Resource Planning (ERP), in higher education institutions. The COVID-19 pandemic has accelerated the adoption of digital technologies, but many universities, especially in developing countries, face infrastructure and resource limitations. The article finds that while MIS can improve operational efficiency and learning, its implementation is still hindered by high costs and a lack of technical skills. The research gap identified is the absence of a holistic and sustainable implementation model in developing countries. As a novelty, the article proposes a collaborative model for MIS implementation, allowing multiple universities to share resources and knowledge. Furthermore, the article recommends the development of comprehensive digital transformation strategies that do not only focus on technical aspects but also involve human resource management and data-driven decision-making. With this approach, higher education institutions can be better prepared to face future challenges and create a more inclusive and efficient educational experience.

Keywords: Digital Transformation, Enterprise Resource Planning, Higher Education, Management Information System.

INTRODUCTION

Digital transformation has become the centre of attention in various sectors of life, including in the world of higher education. The rapid development of information technology, driven by the COVID-19 pandemic, has forced higher education institutions around the world to accelerate the adoption of digital technology in their learning systems. The pandemic has changed the pattern of education from previously face-to-face to more flexible, through the use of digital platforms and distance learning. This transformation is not

a temporary trend, but a structural change that will continue to develop along with technological advances in the future. Therefore, it is important to understand how management information systems (MIS) are integrated into higher education institutions and how this implementation can support the overall digital transformation process.

Digital technologies, such as those used in management information systems, provide significant opportunities for higher education institutions to improve operational efficiency, enhance the quality of instruction, and strengthen interactions between students and faculty. According to research (Guppy et al., 2022) that. The COVID-19 pandemic has accelerated digital transformation in higher education, with the majority of institutions now relying on digital platforms as part of their learning strategies. However, adopting these technologies is not always easy. Higher education institutions face a number of challenges, including infrastructure readiness, limited human resources, and resistance to change, especially in developing countries. Therefore, it is important to conduct a comprehensive literature review to understand the factors that support and hinder the implementation of digital transformation and MIS in the context of higher education.

As part of the digital transformation, management information systems (MIS) play an important role in managing various operational aspects in higher education institutions. MIS includes various systems that integrate academic, administrative, financial, and human resource management information. Research (Jafari & Zolfagharian, 2019) shows that the use of MIS, such as Enterprise Resource Planning (ERP), has a positive impact on user satisfaction and organizational learning capabilities in higher education institutions. In this context, MIS helps institutions respond to student and academic staff needs more quickly and accurately, and provides data analytics that support data-driven decision making. However, the implementation of MIS in various countries, especially in developing countries, still faces many obstacles, including limited technological infrastructure, inadequate human resource skills, and high implementation costs.

In recent years, digital transformation in higher education has not only been limited to technical aspects such as system implementation, but also includes a paradigm shift in the teaching and learning process. According to (Abad-Segura et al., 2020). There is a growing global interest in sustainable management in the digital transformation of higher education, where digitalization is not only seen as a tool to increase efficiency, but also to improve the long-term sustainability of institutions. This transformation encourages institutions to pay more attention to efficient use of resources, reducing carbon emissions, and increasing the accessibility of education through digital technology. However, there is still a gap in research on how digital transformation can be implemented holistically, especially in countries with limited resources.

One of the key elements in digital transformation is technology-based learning. Since the COVID-19 pandemic, hybrid learning—which combines face-to-face and online methods—has become increasingly common. Studies (Castro Benavides et al., 2020) shows that although digital transformation in higher education is increasing, its implementation is still limited to certain aspects and does not yet cover a more holistic transformation. Hybrid learning provides flexibility for students and lecturers, but also demands adaptation in terms of teaching methods and class management. Here, the role of MIS becomes increasingly important to manage more complex academic data, reporting, and scheduling in a more flexible learning context.

However, digital transformation in higher education is not without its challenges. According to research (Mohamed Hashim et al., 2022) Higher education institutions often face challenges in developing the right strategy to leverage digital transformation for their

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competitive advantage. Digital transformation requires a long-term vision and a deep understanding of how technology can support the institution's strategic goals. In addition, many universities are not operationally and financially ready to harness the full potential of digital transformation. In many developing countries, limited infrastructure and resources are major obstacles to implementing integrated digital systems.

On the other hand, the impact of the COVID-19 pandemic has also forced many institutions to adopt online learning on an emergency basis. (Murphy, 2020) in his research stated that although emergency online learning has succeeded in maintaining the continuity of education during the pandemic, many institutions are not yet ready to make a long-term transition to full digitalization. This creates new challenges in terms of how institutions can integrate online learning into more sustainable education models and address the increasingly evident digital divide among students. In line with this, the research (Bartolic et al., 2022) emphasizes that the pandemic has highlighted the need for more adaptive strategies in managing higher education, especially in terms of using technology to support hybrid distance and face-to-face learning. However, there is still much to learn about how this hybrid learning model can be implemented effectively in the long term, and how institutions can adapt to the needs and expectations of students in the digital age.

Based on this literature review, it is clear that digital transformation in higher education presents significant challenges and opportunities. Educational institutions not only need to adopt new technologies, but also change the way they manage resources, interact with students, and integrate technology into the learning process. This study aims to identify gaps in the existing literature related to the implementation of MIS and digital transformation in higher education and provide recommendations for a more holistic and sustainable approach in facing the post-pandemic era. It can be concluded that digital transformation in higher education cannot be viewed only from a technical perspective, but must also be understood as a process that affects various operational, academic, and strategic aspects of the institution. Through an in-depth literature analysis, this study will provide a more comprehensive insight into the challenges and opportunities faced by higher education institutions in their efforts to adapt to the ever-evolving educational environment in the digital era.

RESEARCH METHODS

In compiling the article entitled "New Era of Higher Education: Digital Transformation and Management Information Systems", the methodology used is Systematic Literature Review (SLR). This methodology aims to identify, evaluate, and synthesize relevant literature on a particular topic, in this case digital transformation and implementation of management information systems in higher education.

The following are the stages of the methodology used in this article:

1. Collection of Relevant Articles

   This article is based on a literature review of 15 articles obtained. These articles relate to the theme of digital transformation and management information systems in higher education, with the additional context of challenges and opportunities in the post-pandemic era. The selected articles cover a variety of themes such as technology-based learning, the implementation of ERP systems in higher education institutions, and challenges in implementing technology in developing countries. The articles were

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collected through a review of scientific databases such as Scopus, Google Scholar, and Indexed Journal Sources to gain a deeper understanding of the topics raised.

2. Inclusion and Exclusion Criteria
   Inclusion: The selected articles are those that focus on digital transformation and implementation of management information systems in higher education, especially those relevant to the changes that occurred during and after the COVID-19 pandemic. Articles related to the challenges of implementing technology in developing countries are also included.
   Exclusion: Articles that are too technical and not relevant to the context of higher education or that do not focus on the implementation of management information systems are excluded.

3. Categorization and Thematic Groups
   After collecting the articles, the next step is to group the literature into several main themes that have been identified:
   Digital transformation in higher education: Focus on structural changes in higher education institutions driven by technological developments.
   Implementation of management information systems (MIS): A study of how ERP and other information systems are integrated into higher education operations.
   Impact of the COVID-19 pandemic: A study on how the pandemic has accelerated digital transformation and online/hybrid learning.

4. Literature Analysis
   This stage includes:
   Content Analysis: Identify key findings from each article and compare the different research findings. For example, some articles highlight how the pandemic has accelerated digital learning, while others focus more on the challenges of implementing ERP systems in developing countries.
   Synthesis: Information from relevant articles was then combined to create a conceptual framework that supports the research objectives. This article synthesizes the views of various researchers on the opportunities and challenges faced in implementing management information systems and digital transformation in higher education.

5. Identify Research Gaps
   Based on the literature analysis, this article identifies several research gaps, including the lack of holistic implementation of digital transformation in higher education, as well as the challenges of implementing management information systems in developing countries. These gaps form the basis for proposing a novel research that focuses on a holistic model for digital transformation and MIS in higher education.

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RESULTS AND DISCUSSION

Result

Digital transformation in the higher education sector has become a topic of increasing attention in recent years, particularly accelerated by the COVID-19 pandemic that forced the adoption of technology in the educational process. Various studies have examined the implications of adopting digital technologies, ranging from management information systems to technology-based learning in higher education institutions. This article aims to review the existing literature on digital transformation and the implementation of management information systems (MIS) in higher education, and identify research gaps that can be filled through further studies in the post-pandemic context.

One of the important studies on digital transformation in higher education is a systematic review conducted by(Castro Benavides et al., 2020)This study highlights that although digital transformation has become a necessity, its implementation is still very limited to certain aspects and has not yet covered a more holistic transformation across higher education institutions. This article highlights that many universities focus on learning technology alone, without considering how the integration of this technology can be implemented more comprehensively in operational and administrative management. This shows a gap in research related to how digital transformation can affect the overall structure and management of educational institutions, especially related to management information systems that have not been optimally integrated.

(Alenezi, 2021) discusses the challenges faced by higher education institutions in adopting digital transformation, especially during the pandemic. Although many universities have started using digital tools such as video conferencing, many still struggle with digital readiness, such as infrastructure and commitment to effective implementation. They point to previous research showing that universities' digital maturity lags behind that of the business sector, due to contextual barriers that slow down the adoption of technology in education. This suggests the need for a more mature strategy in dealing with digital change.

In other studies,(Akour & Alenezi, 2022)stating that digital transformation is affecting higher education, the authors also reveal the challenges that institutions face in adopting new technologies. Although many universities have begun to use digital tools such as online learning platforms, there is still a gap in digital readiness. The authors emphasize the importance of improving digital infrastructure, training for faculty and staff, and creating a culture that supports innovation. With the right strategies, universities can be more successful in facing these changes and ensure effective technology adoption for the future of higher education. Research(Harlie et al., 2019)mentioned that the influence of the Internet of Things (IoT) has changed the way universities evaluate performance and disseminate information. This technology requires educational institutions to adopt more sophisticated systems to stay relevant with the latest developments. However, the implementation of this kind of technology does not always run smoothly, because factors such as resistance to change and lack of understanding of technology can hinder this transformation process.

Another study, conducted by(Abad-Segura et al., 2020)focuses on the sustainability aspect in digital transformation management. This article presents a bibliometric analysis of global trends in digital transformation of higher education, especially in terms of sustainable management. The authors identify that despite the increasing adoption of digital technologies, most universities have not fully understood or implemented sustainable management strategies for the long term. Most initiatives are still reactive and do not focus on how these technologies can create sustainable long-term value. This opens up opportunities for further research to explore how sustainability strategies can be developed in digital transformation in the higher

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education sector, as well as how management information systems can play a key role in achieving such sustainability.

In the implementation of management information systems,(Jafari & Zolfagharian, 2019)has examined the impact of Enterprise Resource Planning (ERP) usage on organizational learning capability and user satisfaction in higher education institutions. The study shows that ERP usage significantly improves user satisfaction and the organization's ability to learn and adapt. However, the study also identified challenges in ERP implementation, especially in developing countries where technological infrastructure and human resource support are still limited. This emphasizes the need for further research on how ERP can be implemented more effectively.in higher education institutions with limited resources.

(Harun et al., 2019)in their research highlighted the readiness of higher education institutions in facing the implementation of the Enterprise Resource Planning (ERP) system. They noted the importance of organizational readiness in the pre-implementation phase, focusing on factors that influence acceptance and change in higher education institutions. In this study, they found that factors such as organizational benefits, rational reasons for change, and ease of work resulting from the new system were key to the success of ERP implementation. The results of this study confirm that thorough preparation at the individual and organizational levels is essential for digital transformation to run smoothly and effectively.

(Sarbaini et al., 2019)also underscore the challenges faced by universities when implementing digital systems. They point out that although new technologies offer many benefits, barriers such as organizational inertia and lack of clear communication can slow down the digital transformation process. Therefore, changes in the organization must be carried out carefully and accompanied by ongoing support so that the adopted technology can be fully utilized.

Another relevant study related to ERP implementation is research conducted by(Almigheerbi et al., 2020)which reviews the implementation of collaborative ERP approaches in universities in Libya. The authors found that in many universities in developing countries, such as Libya, information systems are still not running optimally, and ERP system integration is limited by the lack of internal system development capabilities. This study highlights the importance of collaboration between universitiesin developing ERP tailored to the specific needs of higher education institutions in developing countries. Therefore, there is a research opportunity to explore collaboration models that can help universities in developing countries improve ERP implementation and achieve better operational efficiency.

Under research(Althunibat et al., 2019)attention to the challenges of ERP adoption in Jordanian universities. The study found that cultural, social, and cost factors were the main barriers to ERP adoption in higher education institutions in Jordan. While this study providesimportant insights into the factors influencing technology acceptance in higher education, there is a lack of concrete solutions that universities can implement to overcome these barriers. Therefore, further research could focus on strategies that can be used to reduce implementation costs and increase ERP acceptance, especially in resource-constrained countries.

Digital transformation in the higher education sector has also been heavily influenced by the COVID-19 pandemic, which forced universities to shift to online learning and hybrid models in a very short time.(Murphy, 2020)stated that while emergency learning has been successful in maintaining educational continuity, there are still many challenges in managing this transition sustainably. Online learning is seen as a temporary solution, but not all institutions are ready to maintain this model in the long term. This indicates a gap in the literature on how universities can manage the transition from emergency learning to more

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sustainable hybrid or online learning, by leveraging technologies such as ERP and management information systems to support more efficient operational management.

In the post-pandemic context,(Guppy et al., 2022)conveythat although many universities have begun to adapt to hybrid learning models, there is still doubt about whether this change will bring revolutionary changes or just temporary modifications. Most educators and higher education administrators see the hybrid model as the new norm, but students are more skeptical about the long-term benefits of this model. This suggests that there is still much to be learned about how higher education institutions can adapt to hybrid learning models, and how MIS can be integrated to support more flexible and adaptive learning models.

In a more comprehensive study on the impact of COVID-19 on changes in the learning system,(Bartolic et al., 2022)assess that the pandemic has revealed the urgent need for more adaptive learning strategies, in which digital technologies can play a central role. However, the authors also note that most higher education institutions have not fully exploited the potential of these technologies to improve student learning outcomes in the long term. This opens up opportunities for further research to explore how technology can be better integrated into higher education systems, so as not to provide only temporary solutions but also to create sustainable and effective learning models.

One aspect that has not been widely discussed in the literature is how higher education institutions can create competitive advantage through digital transformation.(Mohamed Hashim et al., 2022)argues that universities should focus more on digital transformation strategies that can provide competitive advantages, especially in the era of rapid globalization and digitalization. However, the study also notes that many universities are still struggling to develop comprehensive strategies, mainly due to limited resources and technological infrastructure. This suggests the need for further research on how higher education institutions can use MIS and digital transformation to enhance their competitiveness in the global market.

Based on this literature review, it is clear that digital transformation and implementation of management information systems in higher education face a number of challenges and opportunities. There is a significant gap in how universities can holistically integrate digital technologies into all aspects of their operations and academics. Much of the existing research focuses on the adoption of technology in learning, but little has been done to discuss how these technologies can be used to improve the overall management and operational efficiency of the institution. Furthermore, there is a lack of research exploring how universities in developing countries can overcome resource and infrastructure challenges to effectively implement MIS and ERP.

The novelty that can be offered in this article is the development of a holistic model that combines digital transformation and implementation of management information systems in higher education, with a special focus on developing countries and post-pandemic contexts. This article can offer a new contribution by exploring how MIS can be more effectively integrated in higher education institutions to support more efficient operations, learning, and resource management. In addition, this research can offer sustainability strategies that enable higher education institutions to utilize digital technologies more optimally in the long term, so as not only to overcome short-term challenges but also to create a resilient and adaptive management model for future changes.

Discussion

Digital transformation in the higher education sector has become a topic of increasing attention in recent years, particularly accelerated by the COVID-19 pandemic that forced the adoption Digital transformation in higher education has been rapidly evolving with the advancement of technology, and the COVID-19 pandemic has been a catalyst to accelerate the

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adoption of technology worldwide. One of the key components of this transformation is the implementation of Management Information Systems (MIS) which include digital platforms to manage various aspects of higher education institutions, such as online learning, administration, finance, and campus operations. MIS, specifically Enterprise Resource Planning (ERP), helps universities manage processes more efficiently by integrating data from various work units into one centralized platform. This discussion will explore some of the key themes from the literature review conducted to understand the challenges, opportunities, and impacts of MIS implementation in higher education, as well as the relevance of digital transformation in a post-pandemic context.

1. Digital Transformation in Higher Education: An Inevitable Change

Digital transformation is an evolutionary process that touches all aspects of higher education management, both at the academic and administrative levels. The digital era requires universities to adapt to new technologies, which not only change the way information is managed, but also how teaching and learning are carried out. According to(Castro Benavides et al., 2020)Digital transformation in higher education is often associated with the use of Learning Management Systems (LMS), data analytics tools, and automation systems that contribute to improving the quality of learning and student experience. However, many higher education institutions have yet to fully leverage the potential of this transformation, especially in terms of operational management and alignment with long-term strategy.

The COVID-19 pandemic has forced many universities to shift to online learning, ultimately accelerating the adoption of digital technologies at various levels. (Guppy et al., 2022) highlighted that the pandemic has created a momentum for digital transformation that is expected to persist in the long term, with many universities turning to hybrid learning models as the new standard. However, this also poses new challenges regarding how higher education institutions can ensure the sustainability of this digital transformation, given that most infrastructure, especially in developing countries, is not fully prepared to support this transition.

Within the framework of Digital Transformation Theory, this concept can be seen as how universities integrate technology to create new value. According toDiffusion of Innovation Theory(Rogers, 1995) The adoption process of new technologies such as MIS in higher education institutions follows a curve consisting of several stages, starting from innovators to early majority, late majority, and laggards. The COVID-19 pandemic can be seen as an “innovation trigger” that forces even laggards to adapt to technology faster than expected.

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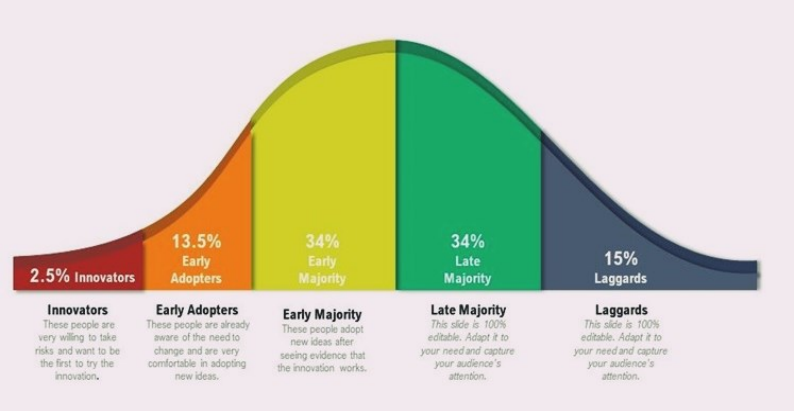

Figure 1. The innovation diffusion process is characterized by the presence of a pattern in the diffusion curve that is formed.

From Figure 1. Shows a curve that has five main segments which reflect the level of innovation adoption by a higher education institution, namely: (1) Innovators: They are the group of higher education institutions that are most open to new innovations. Innovators tend to try the innovation without relying too much on external sources of information. (2) Early Adopters: After innovators, there is a group of higher education institutions that are early adopters, they are those that tend to interact with innovators and have an important role in spreading innovation. (3) Majority: The majority is a group of higher education institutions that are slower to adopt innovations compared to innovators and early adopters. They usually need time and convincing empirical evidence to adopt innovations. (4) Late Majority: is a group of higher education institutions that also follow the majority, but they adopt innovations even slower. They can be influenced by social pressure and urgent needs. (5) Laggards: Laggards are the group of higher education institutions that are the slowest to adopt innovations. They may be less interested in change or have limited access to innovation.(Rogers, 1995)

From this explanation, the implementationThe Diffusion of Innovation Theory in higher education institutions is very important, because it helps understand the dynamics of innovation acceptance and plan appropriate strategies to accelerate the adoption of innovation by higher education institutions.

2. Management Information Systems (MIS) and Their Role in Higher Education

Management Information Systems (MIS) in higher education encompass a range of tools and platforms that help institutions manage data efficiently, improve data-driven decision-making, and provide better services to students and staff.(Jafari & Zolfagharian, 2019)shows that the use of MIS, especially ERP, contributes to increased organizational efficiency and user satisfaction through more structured and accurate data management.

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ERP, as part of MIS, has been adopted in many universities to assist in operational management such as finance, human resource management, and student administration..(Almigheerbi et al., 2020) mentioned that ERP helps universities in increasing transparency and coordination between departments, which in turn can improve the overall effectiveness of the institution. However, the main challenges in implementing ERP in universities, especially in developing countries, are the high cost and the need for adequate technical skills. This article finds that universities in developing countries often struggle to access sophisticated ERP technology due to budget constraints and lack of adequate infrastructure support.

Figure 2. ProcessSuccess of Information Systems DeLone and McLean (1992).

According to DeLone and McLean's (1992) Information System Success Theory, the success of MIS implementation can be measured through six main dimensions: system quality, information quality, use, user satisfaction, individual impact, and organizational impact. The information system success theory developed by DeLone and McLean (1992) is one of the most well-known models used to evaluate the success of information systems (IS). This model identifies six main dimensions that contribute to IS success: (1) System quality: Measures the extent to which the information system meets the technical needs of users, such as ease of use, speed, and reliability of the system. (2) Information quality: Refers to the extent to which the information provided by the system is of high quality, including accuracy, relevance, and timeliness. (3) Use: Measures the extent to which the system is used by users, both in terms of frequency and intensity of use and the information produced. (4) User satisfaction: Measures the level of user satisfaction with the system and its impact on the organization as a whole. (5) Individual impact: Measures the effect of system use on individual performance. This includes aspects such as increased productivity. (6) Organizational impact: Measures the impact of system use on the organization. This includes aspects such as better decision making, and achievement of organizational goals.(Hidayatullah et al., 2020)

This model is dynamic and suggests that these dimensions are interrelated. User satisfaction and system usage influence positive impacts on individuals and organizations, which ultimately reflect the success of the information system. Based on this model, the success of ERP in higher education should be evaluated not only from a technical perspective, but also from the extent to which the system can support the achievement of organizational goals, improve operational efficiency, and create a positive impact on student learning.

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3. Challenges and Barriers to SIM Implementation in Developing Countries

Although the benefits of MIS and ERP are clear, many universities in developing countries still face various challenges in implementing these technologies.(Althunibat et al., 2019)noted that social, cultural, and economic factors are often the main barriers to ERP adoption in universities in Jordan. The study revealed that in many developing countries, universities have to face challenges such as resistance to change, limited human resources, and inadequate technological infrastructure.

In addition, research by(Almigheerbi et al., 2020)in Libyan universities shows that the internal development of ERP systems is still very limited due to the lack of technical capacity and adequate government support. In this regard, universities often rely on external vendors who offer ERP solutions, but these solutions tend to be expensive and do not always fit the specific needs of higher education institutions in developing countries. One solution proposed by this study is the development of a more collaborative ERP approach, where several universities can work together to develop ERP systems tailored to local needs and share the implementation costs. This approach not only reduces costs but also allows universities to better adapt the system to their local context. However, despite the great potential of this model, further research is needed to explore how universities can overcome barriers in terms of technical skills and technological infrastructure.

4. Impact of the COVID-19 Pandemic on Higher Education Learning and Management

The COVID-19 pandemic has forced universities around the world to shift to online learning and hybrid models in a very short time.(Murphy, 2020)explains that many institutions were unprepared for this transition, and emergency online learning implemented during the pandemic often fell short of expected quality standards. However, the pandemic also accelerated the digital transformation in higher education, which is expected to bring about long-term changes in the way higher education is organized and delivered.

(Guppy et al., 2022) noted that while online and hybrid learning have proven effective during the pandemic, challenges remain regarding how institutions can sustain these models in the long term. Many universities do not have the infrastructure to support online learning sustainably, especially in developing countries where internet access and digital devices are still a challenge. This suggests that while the pandemic has accelerated digital transformation, there is still much to be done to ensure that these technologies are implemented effectively and equitably across higher education institutions.

5. Sustainable Digital Transformation Model in Higher Education

Based on the findings of the literature review, it is important for higher education institutions to develop a sustainable digital transformation model. This model should encompass three main pillars: technology, people, and processes.

a. Technology: Educational institutions must invest in technology infrastructure that supports online learning, data management, and management information systems. The technology implemented must be flexible and able to adapt to rapid changes in the world of education.

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b. Human: The success of digital transformation depends on the readiness of human resources in educational institutions. Universities must train staff and lecturers to use new technologies effectively. This also includes the ability of students to access and utilize digital technologies in their learning process.
c. Process: Business processes in educational institutions must be optimized to support operational efficiency and data-driven decision making. The implementation of MIS and ERP must carried out in stages, with a focus on smooth integration between departments and work units.

CLOSING

This article discusses digital transformation and the implementation of Management Information Systems (MIS) in post-pandemic higher education, focusing on challenges, opportunities, and impacts. The COVID-19 pandemic has accelerated the adoption of digital technologies in many universities, not only in learning, but also in operational management through MIS such as Enterprise Resource Planning (ERP). Digital transformation opens up opportunities to improve efficiency, transparency, and data-driven decision-making, although many institutions in developing countries face challenges such as limited infrastructure, skilled human resources, and resistance to change.

Management Information Systems, especially ERP, support the overall management of universities. While universities in developed countries have successfully integrated these technologies, many universities in developing countries require a more collaborative and locally tailored implementation model. In addition, the shift to online and hybrid learning requires a more flexible and adaptive system. Universities need to focus not only on infrastructure, but also on training and support for faculty and students.

Recommendations to improve MIS implementation and digital transformation include developing a holistic and sustainable digital strategy, a collaborative model for ERP implementation in developing countries, and careful planning in online and hybrid learning management. Governments also need to provide policy and financial support to help higher education institutions, especially in developing countries, overcome the challenges of digital transformation. In this way, universities can leverage digital technologies to improve management, operations, and learning, and be ready to face future challenges in the digital era.

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