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Transforming Higher Education: Empowering Learning Through Artificial Intelligence

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Abstract

In the era of Industry 4.0 and widespread digital transformation, global businesses are actively embracing advanced technologies. Simultaneously, the education sector is harnessing digital tools to promote personalised learning and ensure equity. The landscape of higher education is evolving as universities transcend geographical borders, and students increasingly engage on a global scale, propelled by the integration of artificial intelligence (AI)-based tools in education. Recognizing the inevitability of AI's role in future education, ongoing research is dedicated to assessing the awareness among faculty members regarding the applicability and adoption of artificial intelligence.

The study also aims to uncover the ways in which AI enhances the learning experience for both educators and students and examines its impact on the level of work engagement among teachers in higher education. As universities strive to remain at the forefront of educational innovation, understanding the nuances of AI implementation and its effects on teaching and learning experiences becomes crucial. Through this research, insights into the evolving dynamics of education in the digital age are sought, shedding light on the transformative potential of artificial intelligence in shaping the future of higher education.

Keywords: Artificial Intelligence, Higher Education, Digital Transformation

INTRODUCTION

In the 21st century, higher education is undergoing rapid evolution driven by technological advances, globalisation, and shifting student demographics. Online learning platforms have become widely accessible, prompting universities to offer fully online courses and degree programs, increasing educational access and providing flexibility in the learning process (Dieguez et al., 2021; Neumann et al., 2021). The educational landscape is becoming more diverse, emphasising cross-cultural understanding and global citizenship as students enrol and learn from various environments.

As technological advancements accelerate, universities are taking on a crucial role in driving innovation and research, fostering partnerships between academia and industry, and placing greater emphasis on entrepreneurship and commercialization (Amornkitpinyo et al., 2021). In response to changing recruitment trends, institutions are shifting towards skills-based learning patterns that equip graduates with practical, career-focused skills, aligning with employer preferences (Kocak et al., 2021).

To enhance the quality of higher education, the educational industry is exploring various strategies to meet stakeholder requirements (Khan et al., 2022). Notably, one optimistic solution involves the integration of artificial intelligence (AI) (Chedrawi & Howayeck, 2019). The future outlook for artificial intelligence in education is highly promising, with technology undergoing transformative changes that significantly improve the learning and teaching processes (Mishra, 2019).

Artificial intelligence (AI) is playing a crucial role in elevating the quality of higher education through various mechanisms (Choi, 2020). Utilising AI-powered learning approaches, institutions assess students' performance records, identify their strengths and weaknesses, and deliver personalised learning experiences tailored to individual needs, providing students with an effective toolkit for knowledge acquisition (Aldosari, 2020). Technologies like Chatbots, Virtual Assistance tools, and Adaptive Learning Systems, driven by AI, offer immersive and engaging learning experiences, allowing students to explore complex theories and solutions interactively (Chaudhry et al., 2023; Pradana et al., 2023).

In the realm of assessment and feedback, AI aids in grading assignments, detecting similarities through tools like Turnitin, monitoring students' engagement with library resources, and offering faster and more precise feedback. This not only enhances the learning experience but also frees up instructors' time for other aspects of teaching (Essien et al., 2020). AI-powered chatbots provide immediate and personalised assistance to learners for academic and organisational needs, predicting students at risk and facilitating timely interventions to ensure their success.

Various AI applications, such as Bit.ai, Mendeley, Turnitin, elinik.io, and platforms like Coursera, contribute to higher education research by analysing large datasets, generating insights, and identifying patterns that may be challenging for human researchers to discern (Wenge, 2021).

As technology advances, the future holds the promise of more innovative applications of AI in education, leading to increasingly personalized, engaging, and effective learning experiences for students (Li et al., 2021). This ongoing evolution significantly enhances the performance and engagement of teachers in higher education. Recognizing the multifaceted responsibilities of teaching staff, AI adoption automates administrative tasks, including grading assignments and tracking attendance, allowing educators to focus on academic and regulatory activities. AI also aids teachers in identifying areas for professional development, with AI-powered coaching tools offering feedback and suggesting improvements in teaching performance (Bisen et al., 2021).

In the realm of contemporary higher education, persistent challenges such as unequal access, limited inclusivity, and the inadequacy of addressing diverse learning styles pose significant hurdles (Odhiambo, 2016). The prevalent use of traditional, one-size-fits-all teaching methods falls short in effectively engaging students with various learning preferences, impeding the development of active participation and critical thinking skills (Kistyanto et al., 2022). Additionally, reliance on traditional assessment methods lacks the ability to provide a comprehensive understanding of students' knowledge, skills, and practical application, particularly in assessing non-cognitive skills, thereby highlighting the insufficiency of conventional teaching and assessment approaches (Rudolph et al., 2023).

The absence of opportunities for international collaboration and cultural exchange further compounds these challenges in higher education. To address these gaps, the integration of artificial intelligence (AI) emerges as a pivotal solution. AI algorithms have the capability to analyze individual learning patterns, enabling the customization of coursework to cater to diverse preferences. The incorporation of predictive analytics aids in identifying at-risk students, allowing for timely interventions to support their academic journey. AI-driven educational content delivery systems provide adaptability to students' pace, learning styles, and knowledge gaps, thereby revolutionizing the approach to content dissemination. Furthermore, the automation of administrative tasks through AI offers the means to liberate faculty and staff from routine responsibilities, allowing them to focus on more impactful activities.

Ongoing research actively contributes to empowering the higher education system through the adoption of AI. The findings from this research endeavor aim to assist institutional policymakers in recognizing

how the adoption of new technology is perceived in higher education, facilitating the provision of necessary infrastructure and training to overcome specific challenges.

Given the inevitable role of AI in future education, the current research seeks to identify faculty members' awareness levels regarding the applicability and adoption of artificial intelligence. The study also aims to explore how AI enhances their learning experience and influences the degree of work engagement and productivity of teachers in higher education. The manuscript comprises an introduction highlighting the role of AI in higher education, a section on existing literature, and a focus on methodological aspects in the third section. Results and discussions are presented in subsequent subsections, and the research concludes with suitable practical and theoretical implications.

Elements shaping the perspective on artificial intelligence (AI) within higher education:

Adapting to any technological system hinges significantly on individuals' attitudes. According to Al Darayseh (2023), the literature underscores the considerable impact of AI on learners' attitudes in education. The successful implementation of such a system is closely tied to supportive technical advancements and associated infrastructure (Pedral Sampaio et al., 2023). The condition of facilities within an organization plays a pivotal role in shaping the behavioral intentions of its workforce (Venkatesh et al., 2012). A study by van Twillert et al. (2020) highlights the influence of facilities and infrastructure on faculties' attitudes toward the adoption of Web 2.0 technologies in higher education. These research findings underscore the importance of effective facility conditions in the integration of new technologies within higher education.

Applications of AI in higher education:

The introduction of a digitised learning approach has transformed the landscape of the higher education system (Khoza & Mpungose, 2022). Examining the future of education, a study by Carvalho et al. (2022) delved into the collaborative dynamics among learners, teachers, and AI as perceived by society. An essential focus of AI in higher education is enhancing the overall learning experience for students (Ge & Hu, 2020). Furthermore, the adoption of AI has been shown to alter societal perceptions of education, as identified in studies by Chang et al. (2022) and Kelly et al. (2023). However, there are genuine concerns raised in other studies about the incorporation of AI in education, specifically regarding its impact on demographic, cultural, and behavioral aspects of learners and users (Chang et al., 2022). These studies emphatically underscore the interconnectedness between society's acceptance of AI adoption in education and its influence on the attitudes of users.

Utilizations of AI and the Engagement of Faculty Members:

Artificial intelligence has the potential to revolutionize the way teachers engage with students and perform their roles in higher education. AI tools have been used in many institutions to engage in learning activities in a more productive way (Cui et al., 2019). The studies emphasized users’ attitudes toward adopting AI for personalized professional development, course design, grading and assessment, and student support (Franzoni et al., 2020; Rahimi & Tafazoli, 2022). Recent studies explored teachers’ attitudes and behavior in engaging AI-integrated CRM systems and their digital competencies which enhance work engagement (Chatterjee et al., 2021; Ng et al., 2023). Further, Moreira-Fontán et al. (2019) explored the positive emotions and attitudes of academic staff members toward ICT-related aspects that boost their work engagement. Based on these findings the relationship between users’ attitudes and behaviors towards AI

on work engagement is inevitable.

Implications:

In recent times, there has been a rising inclination towards the integration of AI in higher education throughout Asia. Numerous universities and educational institutions are incorporating AI-powered tools like intelligent tutoring systems, chatbots, and automated grading systems into their teaching methodologies. However, the rate of adoption varies across countries and institutions. This research proposes a comprehensive approach involving diverse stakeholders, including legislators, educators, learners, and technology providers, to facilitate the integration of AI in higher education institutions.

Firstly, policymakers are urged to foster a culture of innovation and collaboration in universities by providing financial aid and infrastructural support. This would create platforms where educators, students, and technology providers can collaboratively develop and implement AI-powered tools and solutions.

Addressing concerns about privacy and safety is a key challenge in AI implementation. As more students engage in online learning platforms and share personal data, institutions need to establish clear guidelines for the development and use of AI-powered tools. These guidelines should encompass aspects such as data privacy, security, and ethical considerations. The research underscores the importance of awareness and performance expectancy in applying AI in educational institutions, emphasizing the need for universities to allocate budgets for training and supporting educators in acquiring the essential skills and knowledge to effectively use AI-powered tools in their learning systems. This may involve offering professional development opportunities or partnering with technology providers for training programs.

Policymakers are urged to prioritize the advancement of infrastructure and technology in educational institutions for the successful implementation of AI in higher education. Universities should focus on developing intellectual capital and resources to manage AI tools and technologies. This commitment involves establishing systematic resource development programs, allocating budgets for AI-based software solutions, providing training and support for faculty and staff, and forging partnerships with leading companies in AI research and development. Additionally, through systematic market surveys, institutions should design AI-based curricula and courses to equip students with the skills necessary for future employment and success in an AI-driven world.

Limitations and Suggestions for future research:

The study highlights the transformative potential of AI in revolutionizing higher education and enhancing faculty work engagement. Despite its promising prospects, the adoption of AI in academia faces certain limitations. Many institutions remain skeptical about its effectiveness and implementation, resulting in limited acceptance and integration of AI in higher education. Concerns about the associated costs and complexity further contribute to this hesitation.

Additionally, the use of AI in education raises privacy and security concerns. The application of AI assessment tools, for instance, may inadvertently expose personal information about students, raising issues of confidentiality. Moreover, if AI is utilized in decision-making processes related to faculty work engagement, there is a risk of introducing biases and fostering discrimination.

To address these challenges, it is recommended that future research focuses on the development of ethical guidelines for the application of AI in higher education. These guidelines should comprehensively tackle issues related to privacy, security, and bias, providing a framework for the responsible and effective use of AI in academia.

While the application of AI in higher education and faculty work engagement shows great promise, there are substantial challenges and limitations that must be carefully addressed. As this field is still in its early stages, further research is essential to develop ethical guidelines, particularly with regard to stakeholder privacy, and to explore diverse faculty engagement programs that foster collaboration and meaningful partnerships between academia and industry.

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