Optimizing Online Higher Education Through Artificial Intelligence Advancements in Personalized Learning, Assessment, and Engagement

Ankit Dhamija
http://orcid.org/0000-0003-4456-9680
Manipal University Jaipur, India

Deepika Dhamija
http://orcid.org/0000-0003-1836-0242
Manipal University Jaipur, India

Jhankar Moolchandani
Amity University, Gwalior, India

ABSTRACT

Artificial intelligence (AI) is essential in the field of online education, particularly for personalized learning, assessment techniques, student involvement, and administrative effectiveness. With the escalating popularity of online learning, AI presents unparalleled prospects for improving efficacy and engagement. From analysing student data to optimizing administrative procedures, AI holds the promise of revolutionizing educational experiences for students, educators, policymakers, and administrators, ensuring high-quality learning outcomes in the digital age. This article delves into AI's impact on online education, ranging from customizing learning experiences to refining feedback mechanisms and conducting student assessments. By exploring the diverse applications of AI, this article provides recommendations to positively transform online education through AI.

INTRODUCTION

The higher education landscape is experiencing a transformative shift, driven by the technological advancements and the growing demand for more accessible, flexible, and personalized learning expe-

DOI: 10.4018/407450

riences. Among the technological innovations, Artificial Intelligence (AI) has emerged as a key technology in reshaping online education as it promises to optimize various facets of the learning process, including personalized learning, assessment, and student engagement. This chapter delves into how AI advancements are revolutionizing online higher education, offering tailored educational experiences that meet individual learner needs and improve overall educational outcomes.

The Evolution of Online Higher Education

Online higher education has evolved significantly since its inception, moving from simple correspondence courses to sophisticated learning management systems (LMS) that support a variety of multimedia content & interactive tools. The proliferation of the internet and digital technologies has made it possible for millions of students worldwide to access higher education remotely. This evolution has been marked by an increasing emphasis on flexibility, accessibility, and inclusivity, allowing learners from diverse backgrounds and geographies to pursue their educational goals (Allen & Seaman, 2017).

However, the traditional online education model has faced criticism for its lack of personalization and engagement. Standardized courses and assessments sometimes are unable to understand the unique requirements, preferences, and individual students' learning pace, leading to issues such as low retention rates and reduced learner satisfaction (Muilenburg & Berge, 2005). This is where AI's potential becomes transformative, offering cutting-edge solutions to personalize the learners' experience.

AI in Personalized Learning

Personalized learning is at the forefront of educational innovation, aiming to tailor the educational experience to cater to each learners' individual requirement. To achieve this, AI leverages data analytics and machine learning algorithms for predicting learner behaviour, requirements, and performance. Through adaptive learning technologies, AI can create customized learning pathways that adjust instantly according to student interactions and progress (Zawacki-Richter et al., 2019).

A major AI application in personalized learning is intelligent tutoring systems (ITS) that provide one-on-one tutoring experiences, offering instant feedback and tailored instruction that adapts to the learner's level of understanding. Studies have shown that ITS can significantly improve student learning outcomes by providing a more engaging and supportive learning environment compared to traditional methods (VanLehn, 2011). Furthermore, AI-enabled tools can swiftly recognize students who may be at risk, enabling educators to intervene promptly and offer the needed support to keep them on the right path.

AI in Assessment

Assessment plays a crucial role in the educational environment, providing insights into student learning and informing instructional decisions. Traditional assessment methods, however, often fall short in terms of timeliness, scalability, and the ability to provide detailed feedback. AI offers innovative solutions to these challenges by enabling more efficient, scalable, and nuanced assessment processes.

AI based digital evaluation systems can evaluate a wide range of student submissions, including essays and complex problem-solving tasks, with a high degree of accuracy and consistency (Shermis & Burstein, 2013). These systems not only reduce the burden on educators but also provide students with immediate, detailed feedback, which is crucial for their learning and development.