

Chapter 7

AI–Powered Learning Revolutionizing Smart Education With Personalized Learning Styles

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ABSTRACT

The advent of Artificial Intelligence (AI) has revolutionized the landscape of education by enabling highly personalized learning experiences. This chapter explores the integration of AI in smart education systems to determine and adapt to diverse learning styles, thereby enhancing student engagement and outcomes. By leveraging advanced AI algorithms, educational platforms can analyze students' behavior, pref-

DOI: 10.4018/979-8-3693-8151-9.ch007

ferences, and performance data to tailor content and teaching methods that align with individual learning styles. This adaptive approach not only fosters a more inclusive learning environment but also maximizes the effectiveness of educational delivery. The study delves into various AI techniques, such as machine learning, natural language processing, and data analytics, which are pivotal in developing smart education systems capable of continuous learning and improvement. Additionally, the paper highlights the potential challenges and ethical considerations associated with implementing AI-driven personalized learning in education.

INTRODUCTION

Artificial Intelligence (AI) has penetrated the learning environment and has placed a new revolution that has made it possible to deliver customized learning sessions. In the following years, AI stepped into the domain of smart education, which means these systems should present learning materials and have the ability to apply different teaching methods in accordance with the learners' various needs. Zawacki-Richter et al. (2019) have established that the AI based educational technologies are capable of recognizing the student learning styles to provide relevant and more effective learning. This transition towards the dynamic learning environment has broader practical implications for the improvement of the interests and learning achievements of a given learner due to the focus on the development of the methodologies and approaches to the teaching and learning processes, which correspond to the needs of a particular learner. Another benefit of AI in education is in the sense that using AI, a massive amount of data can be collected from the learners so as to master their learning and behavior patterns. Artificial intelligent and big data play an important role in the process of creating intelligent learning activities that learn from the learners' interactions (Chen et al., 2020). These artificial intelligent tools can ensure that a student is retaining what is being taught and if he/she is having a difficult time with a specific topic the content or the approach of delivery is changed. As noted by Holstein et al., 2019, this results in an active learning process through the adaptation of how content, feedbacks and supports are delivered to the learner on the go. Combining the methods of delivering education with using AI for addressing the individual learning styles, it is possible to promote effectiveness of learning and make the education more available for everyone.

Also, other applications like the Natural Language Processing (NLP) in the artificial intelligence field is changing the ways students approach content in education. The NLP algorithms can understand the written as well as spoken utterances of students that help in the contextualized responses that fit the learning styles of the students (Sarker et al., 2021). Not only does this technology cater for a range of

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