Chapter 5
Enhancing Quality Education in Engineering and Technology Through AI Implementation

M. Dhanasekar
https://orcid.org/0009-0000-9727-7468
School of Law, Vel Tech Rangarajan Dr. Sagunthala R&D Institute of Science and Technology, Chennai, India

Kavya D. N.
https://orcid.org/0009-0008-1603-5036
Artificial Intelligence and Machine Learning, Dayananda Sagar College of Engineering, Bangalore, India

Rijuta Prashant Joshi
https://orcid.org/0009-0009-5993-7790
School of Management, Ramdeobaba University, Nagpur, India

Uma Patil
Department of Computer Science and Engineering, Nutan College of Engineering and Research, Pune, India

R. Somasundaram
https://orcid.org/0000-0002-0377-9094
Department of Management Studies, Kongu Engineering College, Perundurai, India

Subhi Boopa
https://orcid.org/0009-0000-3045-3834
Model Engineering College, India

ABSTRACT

This chapter explores the potential of artificial intelligence and data science in improving quality in education, focusing on aligning learners' needs, enhancing curriculum design, and improving assessment strategies. The chapter explains the uses of predictive analytics for identifying at-risk students, additional targeted paths for motivating the students, and AI-aided tools that foster collaborative learning. It also revises the problems and ethical concerns related to AI and data science

DOI: 10.4018/979-8-3373-5077-6.ch005

applications in the educational context. By adopting these technologies, it will be easier for educators to create a much more engaging, open, and efficient learning environment, which is significantly better placed to help learners understand the nuances of the current learning environment in engineering and technology. This chapter aims to bolster the belief that AI and data science provide a promising avenue for enhancing engineering and technology education.

INTRODUCTION

The system of learning has been through tremendous change over the last few years, especially for any field or discipline like engineering and technology in particular. Since the trends depict increased acceptances on the part of industries of new technologies, the educational institutions require changes to help the students stand as credible contestants for job competitions. AI and data science are important paradigm shifts in the approaches to harnessing these technologies to offer tremendous prospects for enhancing learning. Based on the advanced technologies discussed in this part, this chapter demonstrates how such technologies can be integrated to offer a meaningful, student-centered, and motivating learning environment for engineering and technology learners (Zhai et al., 2021).

AI involves the whole family of technologies. These are some of the industries that have benefited from artificial intelligence, for instance, machine learning, natural language processing, and robotics. These are things that can help determine the very appearance of the face of the educational experience. Data science deals more with getting information and knowledge out of big, voluminous data. AI and Data Science in Unison offer a tremendous source by which educators can gauge students' performances, as well as customize the learning process as well as the strategies to be used in the process. This is important in any engineering and technology program whose curriculum has to adapt constantly to the changing demands of an industry (Chen et al., 2020).

Without a doubt, one of the biggest benefits of AI and data science in education is that its advantages are in its application as a system that allows for individualization of education. The conventional method of, in minutes, can be easily described as one size fits all, and that is often the root of students' disinterest and failed comprehension. However, such factors can be analyzed by AI-driven systems effectively and combined with learning behavior and preferences as well as performance metrics, which means that personal learning experiences can be designed by educators, if required (Luan et al., 2020).

Exploring the Potential of ChatGPT 3.5 in Higher Education: Benefits, Limitations, and Academic Integrity

Linda Marron (2023). *Handbook of Research on Redesigning Teaching, Learning, and Assessment in the Digital Era (pp. 326-349).*
www.irma-international.org/chapter/exploring-the-potential-of-chatgpt-35-in-higher-education/323557