


Chapter 8

Enhancing Quality Education in Engineering and Technology Through AI–Powered Games


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ABSTRACT

This chapter explores for the integration of AI-operated games to enhance quality education in engineering and technology. By providing adaptive education, real-time feedback and gaming problems, AI-powered educational games promote fictional understanding, complex thinking and engagement of students. These tools personalize learning experiences based on personal performance and preferences, making complex engineering and technical concepts more accessible and interactive. This

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chapter also features case studies and best efforts that show the improved results and skills acquisition of education. Emphasizing innovation and incorporation, the chapter presents AI-powered gaming as a transformative approach to modern educational patterns and industry readiness.

INTRODUCTION

The evolution of education in the 21st century has seen significant changes in technology and the changing needs of learners and industries. Engineering and technical education, in particular, demand innovative pedagogy approaches that organize digital-original pay-generation with learning choices and dynamic requirements of modern industries. Traditional Direct Teaching Methods, however, are often short in stimulating the skills of criticism, engagement, creativity and applied problem solving necessary for engineering graduates. In response to these challenges, artificial intelligence (AI)-Power has emerged as a promising boundary to enhance the quality of educational games learning experiences, especially in technical disciplines where abstract concepts and complex systems are common(O'rinbekovna & others, 2024).

Artificial intelligence, defined by its ability to follow human intelligence through machine learning, natural language processing and data-operated decision making, has revolutionized many industries, and its application is gaining momentum in education. When integrated into educational sports, AI becomes a powerful tool to create a personal, adaptive and attractive learning environment. These intelligent systems constantly analyze the learned behavior, assess progress, and adjust the material in real time to match personal learning styles, knowledge intervals and cognitive abilities. For engineering and technology students, it means to face concepts such as thermodynamics, control system, circuit analysis, or interactive, game-based framework that refers to theoretical knowledge through simulation and challenges(Amer-Yahia, 2022).

Gamification Points includes points, levels, feedback loops and storytelling elements - enhance inspiration, strengthen retention, and transform passive learners into active participants. AI expands these benefits by ensuring that the game mechanics adapt to the learner's motion and understanding. For example, in the design of the game teaching algorithm, the AI engine can monitor how students solve every challenge, providing signals when they struggle, and increasing the complexity of expertise. This dynamic, repeated loop keeps learners in the best field of development, known as the "zone of proximal development" in academic theory. Unlike stable textbooks or predetermined lectures, AI -operated games provide liquid experiences where each action and decision feeds in the intelligent model of the learner's progress(Anwar & Ahyarudin, 2023).

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