


Chapter 7


Authoring Academic Resources for Science Education With a Generative AI Tool

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ABSTRACT

This book chapter introduces an LLM-powered educational tool for building science learning environments using a fully cloud-based platform. The tool is an educational platform driven by LLM that attempts to save teachers time by automatized processes

DOI: 10.4018/979-8-3373-2913-0.ch007

like lesson planning, grading, and resource generation. Using this platform, educators can modify and update pre-existing materials to fit the needs of any reader, produce unique science-related resources, and edit and distribute these materials to students. Any student can access instructional materials generated with the authoring tool interface through an internet-connected device. The tool accomplishes this by combining several technologies, including frameworks and tools like Ollama, JavaScript, and open-source LLMs like LLaMA 3, DeepSeek, Qwen2, and Gemma 2.

INTRODUCTION

Extended Reality (XR) and Extended Language Models (LLM) are disruptive technologies that are redefining multiple aspects of everyday life, especially in education. Students and teachers face new challenges, but also valuable opportunities to integrate these tools into the design of more immersive, personalized, and effective learning experiences.

Generative Artificial Intelligence has a significant impact on application fields, including science, education, medicine, languages, technologies, programming, and other fields, as it has been increasing in popularity since the emergence of ChatGPT (Banh & Strobel, 2023). These Artificial Intelligence (AI) tools can generate models based on contextual recognition of human-generated information, providing it in text, audio, image, and file import formats.

Advances in AI, particularly in machine learning (ML) and deep learning (DL), have led to data-driven AI techniques, such as predictions, classifications, or recommendations, evolving effective content generation in various formats, including blockchains, realistic images, video generation, or 3D model generation. The implementation of AI has led to the improvement and adaptation of the relationship between humans and intelligent systems, giving way to the automation of tasks and optimization of processes to ease decision-making, both in the business sector and in the personal life of the human being.

Generative Artificial Intelligence (AI) has turned into a key factor in the solution of many activities in areas such as business, industry, and marketing. Recently, it has become a tool that solves specific tasks, capable of learning, making creations, making some decisions, and even adapting and adjusting itself. Unlike other tools, AI has the power to analyze data, recognize patterns, and choose the best ways to act immediately.

But even with all this progress, there are still many things that people don't understand about what AI is, the magnitude that it can have, what it can do, and the limitations it can bring. This misperception of people leads to many fallacies and ignorance of how to use AI in the right way. These unclear ideas show that a clear

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