


Chapter 5


An LLM–Based Smart Repository Platform to Support Educators With Computational Thinking, AI, and STEM Activities

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ABSTRACT

In this chapter, we aim to describe the design technology and educational necessity of a smart repository platform, which supports educators with all necessary materials and activities to plan and execute lesson plans, based on computational thinking and STEM activities. To this end, our platform provides guidance and STEM – based lesson plans, functioning as one point of access, where educators provide, as an input, their description about the lesson characteristics (i.e. the learning goals, the activities topics, the didactic approach etc.) and the platform makes all necessary information correlations and outputs the appropriate response to provide lesson

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plans and activities. For example, a request could be like “Design a lesson plan dedicated to K9 students concerning sports which promotes algorithmic thinking and decomposition”. The quality of the output depends on the quality of the raw input material. Regarding the platform’s technology, we exploit a large, ready – made language model (LLM), like Meltemi, in conjunction with the Open WebUI.

1. SMART REPOSITORY PLATFORMS FOR EDUCATIONAL PURPOSES

Smart platforms, for educational purposes, are essential as they are used to manage educational resources and making them easily accessible for students and educators. The type of these resources range from simple texts to activities and rich audio – visual files. They enhance collaboration, support diverse learning styles and provide tools for content curation and sharing. By enabling the organization of materials like articles, videos, and assessments, these platforms ultimately foster a more interactive and efficient learning environment. Delving into their features reveals capabilities like metadata tagging, search functionality, and integration with learning management systems, which further enrich the educational experience. Such repository platforms, offer numerous benefits for both students and teachers, in terms of educational contexts. For students, such benefits are as follows:

1. **Resource Variety:** Students access diverse materials, such as videos, articles, quizzes, interactive activities, which caters to different interests and learning paces.
2. **Collaboration:** Students may engage themselves in collaborative projects and discussions, with their peers and cultivate communication skills. In that case, platforms may provide a real time connection and collaboration over the same-shared projects.
3. **Accessibility:** Students can easily access a wide range of resources, anytime, anywhere, facilitating self – directed and self – paced learning.
4. **Personalized Learning:** These platforms often support various learning styles, allowing students to choose resources that best fit their personal learning needs. Moreover, many platforms also include features like search functions and organization tools, making it easier for students to manage their study materials.

Following, the benefits of smart platforms for teachers (i.e. educators) are as follows:

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