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ADAPTIVE CLOUD LEARNING TUTOR USING LLM

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Abstract So these are the contents of my research paper. These are some PPT slides I want you to convert into a paper presentation which consists of six pages. I want you to give me abstract, keywords, introduction, proposed system architecture, methodology with some modules, and experiments and results, results and discussions, conclusions, and some references. Please don't add on your own. If you want any other information, you can ask me. Make it plagiarism-free, more humanized way. That's it. Make it in a structured manner. Learning Management Systems (LMS) have become an essential component of modern education, enabling institutions to deliver courses, manage assessments, and track learner progress through digital platforms. However, most traditional LMS platforms operate using static recommendation techniques and predefined rules, offering minimal personalization to learners. As a result, students often struggle to identify suitable courses aligned with their interests, skill levels, and academic goals. Additionally, mentor allocation is frequently manual or generic, reducing the effectiveness of guidance and academic support. This research proposes an Intelligent Learning Management System (iLMS) powered by Large Language Models (LLMs) and collaborative recommendation mechanisms. The system processes structured and unstructured data such as student interactions, course materials, feedback, and mentor profiles to generate semantic embeddings. These embeddings capture learner preferences, knowledge levels, engagement patterns, and mentor expertise. Based on this understanding, the system delivers personalized course recommendations, adaptive learning paths, and intelligent mentor-student matching. The proposed system also integrates real-time performance monitoring, predictive analytics, and dynamic assessment mechanisms to identify knowledge gaps and adjust content difficulty accordingly. Interactive dashboards provide continuous feedback to students, mentors, and administrators. By combining LLM-based semantic analysis with adaptive recommendation strategies, the iLMS enhances learner engagement, improves academic outcomes, and provides a scalable solution for personalized digital education.

Keywords Learning Management System, Large Language Model (LLM), Personalized Learning, Course Recommendation, Adaptive Learning Path, Mentor-Student Matching, Semantic Embedding, NLP, Collaborative Recommendation, Educational Data Mining.

I. INTRODUCTION

An online course portal is a web-based platform that provides access to a variety of educational courses and learning materials over the internet. It serves as a virtual learning environment where students can enroll in courses, access course materials, interact with instructors and other students, submit assignments, take quizzes or exams, and track their progress. Online course portals offer a convenient and flexible way for individuals to learn at their own pace and from anywhere with an internet connection. They have gained significant popularity in recent years due to their accessibility, affordability, and the wide range of courses available across different subjects and disciplines.

These portals typically host courses from various educational institutions, independent instructors, or online learning platforms. They may offer both free and paid courses, and often include multimedia content such as videos, presentations, and interactive learning materials to enhance the learning experience. The online course portal provides a centralized platform for students to explore different courses, enrol in the ones that interest them, and access the necessary resources to complete the course. It may also include features such as discussion forums, messaging systems, and progress tracking tools to facilitate communication and engagement between students and instructors. Overall, an online course portal offers a convenient and flexible alternative to traditional classroom-based learning, allowing individuals to acquire new skills, pursue personal interests, or enhance their professional development through self-paced online courses.

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Fig. 1 A sample graph

II. CONCLUSION

In conclusion, the project is designed to provide a personalized, adaptive, and efficient learning experience by leveraging Large Language Models (LLM), NLP techniques, and machine learning-based recommendation algorithms. The system integrates Flask for back-end operations, Bootstrap for responsive front-end interfaces, and MySQL for reliable data management, ensuring seamless performance and scalability. Core functionalities such as personalized course and mentor recommendations, adaptive learning paths, real-time progress tracking, and intelligent notifications collectively enhance student engagement and learning outcomes. By automating course and mentor matching and providing data-driven insights, the system reduces manual effort, streamlines decision-making, and fosters a tailored educational experience. Overall, the iLMS demonstrates the potential of AI-driven platforms in transforming traditional learning environments into dynamic, user-centric, and intelligent systems for students, mentors, and educational institutions.

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