Project ID: 23

Project Title
Personalised Ai Learning Agent

Client Name
Dr.Basem Suleiman, Jinglin Sun

Group Capacity
2 groups

Project Background
Delivering personalised learning at scale remains a persistent challenge in education. Traditional instructional models often struggle to accommodate the diverse learning needs, styles, and paces of individual students, particularly in large or asynchronous learning environments. This gap frequently results in mismatches between the form of instruction and student preferences, leading to reduced engagement and learning efficacy. In addition, instructors face increasing pressure to provide adaptive materials, timely feedback, and diverse learning resources—all of which are difficult to scale manually. These limitations highlight the need for intelligent systems that can dynamically respond to individual learner needs, adapt content delivery, and support self-regulated learning processes. This capstone project addresses these challenges by proposing the design and development of a personalised AI learning agent.
The project goal is to design and implement a web application that delivers personalised learning support through the integration of AI agent APIs.

Project Scope
The web application allows students to interact with the AI agent to receive learning materials tailored to their needs. Students will be able to set up and update their learning profiles, choose topics of interest, and access content in multiple formats such as text explanations, diagrams, and interactive questions. The agent will provide personalised exercises, instant feedback, and learning tips to promote independent learning.
The system will incorporate LLMs and optionally vision-based models to generate adaptive content and evaluate student responses. A progress tracking module will help users monitor their learning over time, offering visual insights into performance and engagement. On the technical side, the project will involve implementing a responsive user interface, integrating AI APIs, and managing user sessions and data.

Project Requirements
The application includes the following core modules and features:

Student Users (The primary users are students who seek personalised and adaptive

learning support.)
• Register and create a personalised learning profile with information.
• Update profile details anytime.
• Select subject areas, concepts, or topics they wish to study through a simple interface.
• Access learning content presented in a variety of formats.
• Receive personalised practice tasks automatically generated by the AI agent.
• Receive instant feedback and progress guidance to support self-regulated learning
• View a personalised progress dashboard.

System Features
• Web-based user interface with responsive design.
• Integration with Large Language Models (LLMs) and optionally Vision LLMs for generating multimodal content and feedback.
• Dynamic task generation and evaluation aligned with user progress
• Personal progress tracker that logs learning activity and visualises performance over time.
• Account and session management for storing user profiles and learning history.

Required Skills

• Web application development (front-end and back-end)
• Fundamental grasp of Large Language Models (LLMs)
• (Optional) Basic Agent framework concepts (Langgraph, Langchain, AutoGen…)
• This project is well-suited for postgraduate students majoring in AI, but is also open to undergraduate students who possess relevant AI skills.

Expected Outcomes

• Functional Prototype: effectively demonstrates the core functionalities
• Source Code: complete, well-organised, and adequately commented source code for all custom-developed components of the agent.
• Final Project Report
• User Guide: A concise and easy-to-understand guide for end-users (i.e., students) explaining how to effectively interact with the features of the prototype agent.

Disciplines

Web Application Development;Generative AI (GenAI);Artificial Intelligence (Machine/Deep Learning, NLP);

Other Resources

None