# Project Documentation

## Project Title: Personalized Learning with Generative AI and LMS Integration

1. Introduction

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2. Project Overview

Purpose:

This project enables personalized learning experiences using Generative AI models integrated with a Learning Management System (LMS). The system dynamically creates custom learning materials—such as quizzes, notes, summaries, and adaptive feedback—tailored to each learner’s behavior and progress.

Features:

AI-generated personalized content (lessons, assignments, tests)

Learner profiling based on interaction data

Real-time adaptive learning paths

Interactive dashboards for learners and educators

AI-based progress analysis and recommendations

3. System Architecture

Component Technology / Description

Generative AI Large Language Models (e.g., GPT-4) for content creation

LMS Platform Integration with LMS for content delivery and tracking

Database Learner profiles, content logs, interaction records

APIs AI content generation, learner progress tracking, recommendations

4. Setup Instructions

Prerequisites:

Python 3.x

OpenAI API or Custom Generative AI Model

LMS platform (Moodle, Canvas, or custom LMS integration)

Git

Installation Steps:

1. Clone repository: git clone <repo\_url>

2. Set up environment variables (API keys, LMS integration credentials)

3. Run AI content generation service

4. Integrate with LMS using provided API endpoints

5. Module Structure

AI Content Generator:

Generates lessons, quizzes, summaries using learner profile data

Learner Profiling Module:

Tracks behavior, interaction, preferences, and outcomes

Recommendation Engine:

Suggests next content or activities based on progress

Integration Layer:

Connects AI services with LMS APIs for seamless delivery

6. Usage Instructions

Learners interact with the LMS as usual

AI dynamically generates and pushes content based on their performance

Progress is tracked in real-time and fed back to the AI model for better recommendations

7. API Endpoints

Endpoint Functionality

POST /generateContent Generates custom content for learner

POST /trackProgress Updates learner’s progress and feedback

GET /recommendNext Provides next best learning step

8. Authentication

Secure Token Authentication

Each API call uses tokens to protect learner data and ensure security.

9. User Interface

Features:

Personalized Learning Dashboard

Real-time Content Generation Display

Adaptive Recommendations

Learner Progress Tracking

10. Sample Screenshot of Personalized Learning with Generative AI & LMS Integration

11. Testing

AI Testing:

Prompt testing, content quality checks

Integration Testing:

API calls to LMS, content delivery validation

User Testing:

Feedback from learners and educators

12. Demo

Demo Link:

https://youtu.be/fake-demo-personalized-learning

13. Known Issues

Generation time depends on AI model size

Limited support for complex learner emotional data

14. Future Enhancements

Real-time emotion-based content adaptation

Voice-based interactive content creation

Integration with AR/VR for immersive learning