Project Idea Proposal: Personalized Learning System for Ethiopian Education

1. Project Idea:
We propose a Personalized Learning Management System (PLMS) to improve the quality of education for Ethiopian high school students by recommending tailored study materials. The system will assess intelligence levels and suggest adaptive learning paths by analyzing learning styles (visual, auditory, kinesthetic), past experiences (grades, social media use, assignments), and study behaviors. It addresses Ethiopia's low education quality, using EUEE preparation (3.2% pass rate in 2023) as a key use case.

2. Relevance to Sustainable Development Goals (SDGs):
This project aligns with SDG 4 (Quality Education) by enhancing access to equitable education in Ethiopia, a developing nation with significant educational disparities. It empowers underserved students, including those preparing for exams like the EUEE, reducing inequality (SDG 10) through personalized learning (SDG 4.1).

3. Literature Examples:
Belachew & Gobena (2017) used Naïve Bayes to predict student performance at Wolkite University, Ethiopia (95.7% accuracy), validating ML for academic prediction in Ethiopian contexts, which we extend to high school education.

Tadesse et al. (2020) applied Gradient Boosting to predict Ethiopian secondary students' performance, using exam results and study habits, supporting our predictive modeling approach.

Wu et al. (2015) developed a MOOC recommendation system using collaborative filtering, which we adapt for the Ethiopian high school curriculum.

4. Your Data:
Data will come from students' quiz results, study behaviors, and online material engagement, sourced from app interactions (quizzes, surveys), content databases (e.g., Fetena), and public resources. A synthetic baseline of 50 past students will capture learning styles, past experiences, and academic outcomes. Formats: CSV (scores, profiles), text (materials), logs (behavior). Preprocessing includes cleaning, feature extraction (e.g., time spent), and standardization. Fresh data from 10-25 app users will include quiz scores and profiles.

5. Approach (Machine Learning or Deep Learning):
We will use machine learning, combining Collaborative Filtering (K-Nearest Neighbors) for recommendations and Decision Trees to analyze learning styles and past experiences' impact on academic performance. ML suits structured data (profiles, records, habits), ensuring an efficient, interpretable PLMS.