

# EDU TUTOR AI: PERSONALIZED LEARNING

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## **SUBTITLES:**

- INTRODUCTION
- PROJECT OVERVIEW
- ARCHITECTURE
- SETUP INSTRUCTIONS
- FOLDER STRUCTURE
- AUTHENTICATION
- USER INTERFACE
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## 1. INTRODUCTION:



**EduTutor AI** is a cloud-based educational platform that harnesses the power of generative AI to deliver adaptive, personalized learning experiences for students across academic levels. Built using technologies like **IBM Watsonx**, **Granite foundation models**, **Google Classroom APIs**, **Pinecone vector database**, and **Streamlit**, it creates a modular and intelligent learning ecosystem.

### Key Features:

- **Dynamic Quiz Generation:** Automatically creates quizzes tailored to each student's learning level and course content.
- **Real-Time Feedback:** Evaluates student responses instantly, offering insights and suggestions for improvement.
- **Google Classroom Integration:** Syncs with classroom data to align quizzes and assessments with actual curriculum.

## 2. Project Overview:

EduTutor AI is a cloud-based, AI-powered educational platform that delivers personalized learning experiences through dynamic quiz generation, real-time feedback, and adaptive diagnostics. It integrates with Google Classroom and other educational APIs to tailor content to each student's needs.

## 3. Architecture:

### Tech Stack:

- **Frontend:** Streamlit (Python-based UI)
- **Backend:** Flask + FastAPI
- **AI Engine:** IBM Watsonx + Granite LLM
- **Database:** Pinecone (vector DB) + PostgreSQL
- **Authentication:** OAuth 2.0 via Google Classroom
- **APIs:** Google Classroom, Quizlet, Khan Academy, OpenEd

## 4. Setup Instructions:

To set up personalized learning with an edututor AI ,first,select an AI tool that aligns with your specific learning goals and then gather data on student performance, learning styles, and interest to train the AI .

- It offers personalized learning paths, adjusting content to your pace, strengths, weaknesses.
- It has interactive quizzes & assessments and tracks progress over time.

- It integrates various content types (videos, text, exercises) so you can choose how you learn best.

## 5. Folder structure:

To create a **personalized learning folder structure** for **EduTutor AI**, the goal is to organize your digital learning materials (notes, quizzes, progress reports, etc.) in a way that supports your learning goals, pace, and style.

Here's a **recommended folder structure** — simple, flexible, and works whether you use EduTutor via web, Google Drive, local folders, or cloud storage.

### How to Set It Up

- **Local (Windows/Mac):** Create this in your Documents or Desktop folder.
- **Google Drive / OneDrive / iCloud:** Create it online for backup and cross-device access.
- **Apps like Notion or Obsidian:** Use this as a template structure in pages/subpages.

## 6. Authentication:

For "edu tutor AI: personalized learning: authentication," the term "authentication" isn't directly discussed as a feature of AI tutoring itself, but rather as a necessary security and user management function for any online platform. While AI tutors offer personalized learning by adapting to a student's needs,

platforms must have user authentication to protect student data and control access to personalized learning paths and progress records. This involves verifying a user's identity to ensure only the authorized student can access their tailored content and private information within the AI tutoring system.

## 7. User interface:

An AI tutor's user interface (UI) is designed for personalized learning by offering features like adaptive learning paths, interactive chatbots for instant support, real-time progress tracking, gamification, multimodal content options, and accessibility features. These UI elements enable the AI to deliver customized lessons, provide immediate feedback, keep learners engaged, and support diverse learning styles and needs, ensuring a more effective and individualized educational experience.

## 8. Testing:

AI-powered personalized learning platforms use testing and continuous assessment to adapt content, difficulty, and feedback to individual students, enhancing engagement and outcomes. AI

tutors provide 24/7 support, answer questions, and give instant, personalized feedback on performance, allowing students to learn at their own pace and focus on areas needing improvement. These systems track progress, identify learning gaps through data analytics, and offer customized study recommendations and practice tests, making learning more effective and accessible.

## 9.OUTPUT:

Educational AI Assistant

Concept Explanation

Quiz Generator

Enter a concept

machine learning

Explain

Explanation

Machine Learning (ML) is a subset of artificial intelligence (AI) that involves training models on data to make predictions or decisions without being explicitly programmed for each task. Instead of hard-coding rules, ML algorithms learn patterns from input data and use these insights to improve performance on new, unseen data. Here's a detailed breakdown of the concept, including key concepts, popular algorithms, and real-world applications:

- Supervised Learning**: In supervised learning, the model is trained on a labeled dataset, where both input features (X) and the corresponding output labels (y) are provided. The goal is to learn a mapping function  $f(X) = y$  that can accurately predict outputs for new, unseen inputs.
  - Example**: Image Classification. A supervised learning algorithm might be trained on a dataset of 10,000 images, each labeled with the correct object category (e.g., cat, dog, car, etc.). After sufficient training, the model can classify new images into the correct categories it learned during training.
  - Popular Algorithms**: Linear Regression, Logistic Regression, Decision Trees, Random Forests, Support Vector Machines (SVM), Naive Bayes, k-Nearest Neighbors (k-NN), Neural Networks and deep learning models.
- Unsupervised Learning**: Here, the model is given an unlabeled dataset, and it must find hidden structures or patterns on its own. Unsupervised learning can be further divided into clustering and dimensionality reduction techniques.
  - Example**: Customer Segmentation. An unsupervised learning algorithm could automatically group customers based on their purchasing behaviors, demographics, or other available data. The goal would be to segment customers into distinct groups without knowing the 'right' number or categories in advance, hence the term unsupervised.
  - Popular Algorithms**: K-Means Clustering, Hierarchical Clustering, DBSCAN (Density-Based Spatial Clustering of Applications with Noise), Principal Component Analysis (PCA), t-distributed Stochastic Neighbor Embedding (t-SNE).
- Reinforcement Learning**: In contrast to supervised and unsupervised learning, reinforcement learning involves an agent interacting with an environment. The agent takes actions, receives feedback in the form of rewards or penalties, and iteratively learns to maximize cumulative rewards over time.

## 10. CONCLUSION:



AI-powered personalized learning is a significant advancement that revolutionizes education by adapting to individual student needs, improving engagement, and promoting equity. However, its full potential requires addressing ethical concerns, ensuring equitable access, and implementing it thoughtfully and responsibly in collaboration with educators and policymakers to create an inclusive, effective, and accessible future for all learners.