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## Title: AI-Powered EdTech Platform for Personalized Learning

**TEAM TRACK: SY**

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# INTRODUCTION



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## Overview:

In today's digital education landscape, students often struggle with standardized learning methods that do not adapt to their unique learning styles. Our AI-powered EdTech platform is designed to personalize learning experiences through AI-driven adaptive quiz generation and intelligent study recommendations.

## Key Objectives:

AI-Driven Quiz Generation – Create quizzes dynamically based on student performance. Personalized Study Plans – Recommend materials tailored to students' strengths and weaknesses. Sustainable Learning Encouragement – Track and reward study habits for better engagement. Real-Time Performance Analytics – Provide insights into learning progress instantly.

## Why AI in EdTech?

Adaptive Learning – AI dynamically adjusts quiz difficulty for each learner. Personalized Recommendations – Ensures students receive the right content at the right time. Efficient & Scalable – Supports hundreds of students simultaneously with real-time insights.



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# METHODOLOGY



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**Our system integrates Reinforcement Learning (RL), Knowledge Graphs, and Graph Neural Networks (GNNs) to create an intelligent, fully adaptive learning system from scratch**

## Quiz Generation (AI-Driven Adaptive Learning)

### ProcessFlow:

1. Student starts a quiz on a selected topic.
2. AI assesses performance after each question: If correct → Increase difficulty. If incorrect → Provide simpler questions and explanations.
3. Reinforcement Learning (Multi-Armed Bandit Algorithm) optimizes quiz difficulty dynamically.
4. Continuous feedback loop ensures personalized difficulty adjustment

### Personalized Study Recommendations

AI-based recommendations based on past quiz performance using:

Graph Neural Networks (GNNs) – Understands concept relationships through a Knowledge Graph.

Collaborative Filtering (CF) – Recommends study materials based on similar student behaviors.

### What does the recommendation system suggest?

Study Materials (Videos, Articles, Summaries), Practice Questions based on weak areas, Personalized Learning Paths. Sustainable Learning Habit Tracking Dark Mode Encouragement – Promotes energy-efficient study habits. Low Bandwidth Content – Ensures accessibility in remote areas. Engagement Leaderboard – Rewards students for regular studying.

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# TECH-STACK AND FUTURE SCOPE



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## Frontend:

HTML & CSS – Lightweight, responsive UI for quizzes and dashboards.

## Backend:

Flask – Handles all API requests, authentication, and business logic.

## Database:

MySQL – Stores quiz results, student progress, and leaderboard data.

## Machine Learning & AI:

Reinforcement Learning (Multi-Armed Bandit) – Optimizes quiz difficulty dynamically. Graph Neural Networks (GNNs) – Builds a Knowledge Graph for structured learning paths. Collaborative Filtering (CF) – Suggests personalized study materials.

## 1. Advanced AI Enhancements

Transformer-Based Question Generation – Using T5/GPT to create context-aware questions.

## 2. Auto-Graded Short Answer Evaluation

NLP-based assessment of open-ended responses.

## 3. Voice & Handwriting IntegrationVoice-Based Answering

Allows students to speak answers instead of typing. Handwritten Answer Recognition – AI detects and evaluates handwritten solutions.

## 4. Gamification & EngagementAI Tutoring Bot

Interactive guidance based on students' past mistakes. Rewards & Badges – Motivates students with gamification features.

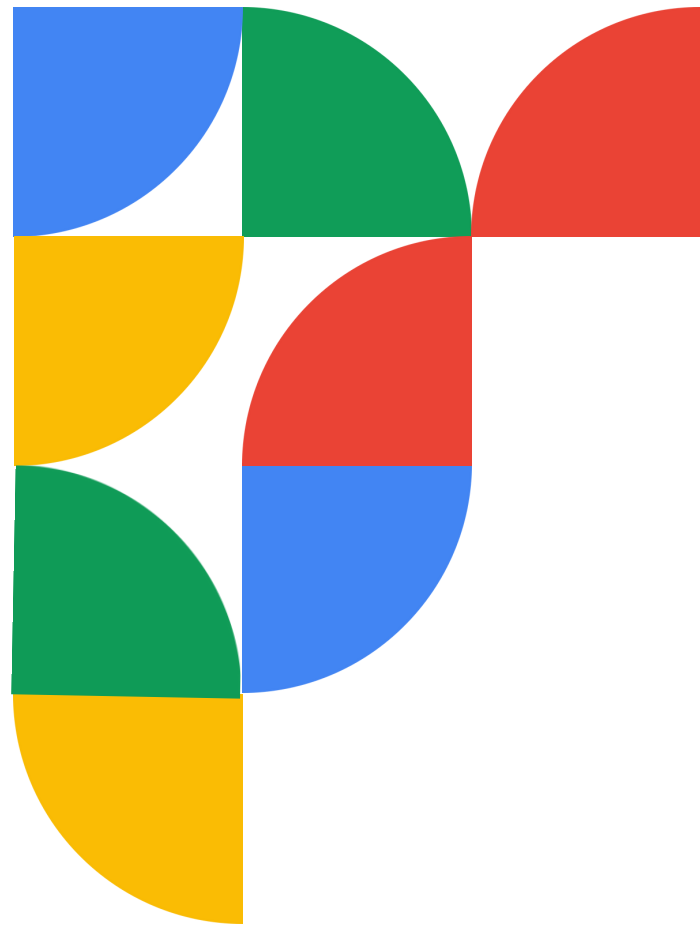
## 5. Multilingual SupportAI

generated quizzes, study plans, and recommendations in regional languages for accessibility. E. Industry Collaboration Partner with EdTech companies & universities for real-world deployment.

## Key Highlights:

Fully Built from Scratch – No pre-built APIs or third-party solutions. Intelligent Adaptive Learning – Personalized quizzes and study recommendations. Real-Time Performance Insights – Immediate feedback & analytics. AI-Powered Learning Paths – Graph-based knowledge mapping for better retention. Scalable for 100+ Users – Supports concurrent usage with optimized Flask + MySQL backend. ---Final Thoughts This AI-powered EdTech platform is a next-generation learning system that adapts to each student's needs, making learning more efficient, engaging, and effective. With reinforcement learning, knowledge graphs, and intelligent recommendations, we create a smart, scalable, and accessible learning experience

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# THANK YOU

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