

# EduGame AI — Project Documentation

## 1. Overview

EduGame AI is an intelligent learning and teaching assistant designed to bridge the communication gap between students and teachers while transforming learning into an interactive, personalised, and gamified experience.

The system empowers both Students and Teachers with AI-driven tools for doubt solving, lesson planning, performance analytics, quizzes, assignments, and automated feedback.

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## 2. Core Goals

1. **Bridge the communication gap** between students and teachers.
  2. **Make learning interactive, personalised, and gamified** using AI.
  3. **Provide accurate academic support** including answers, summaries, quizzes, and instant feedback.
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## 3. User Roles

EduGame AI has two primary user roles: - **Student** - **Teacher**

The system automatically identifies the user role based on the message context and responds accordingly.

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## 4. Student Capabilities

### 4.1 AI Doubt Solver

- Provides accurate, step-by-step explanations for academic questions.
- Supports subject-wise categorization.
- Chat-like interface for smooth conversation.

### 4.2 Summaries & Learning Content Generator

Students can upload **PDFs, notes, or lecture content** to receive: - Key point summaries - Short notes - Flashcards - Quick quiz questions

### 4.3 Quiz Generator

- Generate quizzes for any topic.
- Provides explanations for correct and incorrect answers.

#### **4.4 Assignment Helper**

- Helps students understand concepts needed for assignments.
- Does not provide full solutions unless the student explicitly requests.

#### **4.5 ★ Unique Student Feature: "Explain My Mistake" AI Checker**

Students can upload or type their wrong answers. The AI will: 1. Identify the mistake 2. Explain why it is wrong 3. Provide the correct solution 4. Give 1-3 similar practice questions

This unique feature improves deep learning and boosts student confidence.

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### **5. Teacher Capabilities**

#### **5.1 Class & Student Management**

- Create classes or sections.
- Share class codes for student enrollment.
- View and manage student lists.

#### **5.2 AI Quiz Generator**

Teachers can: - Select subject, topic, and difficulty. - Generate full quizzes with marks and explanations. - Assign quizzes directly to classes.

#### **5.3 Assignment Creator & Evaluator**

- Create assignments with deadlines.
- Students submit online.
- AI performs first-level evaluation and assigns marks with feedback.

#### **5.4 Analytics & Insights**

- View topic-wise performance.
- Identify strong and weak students.
- Get insights on class-wide mistakes.

#### **5.5 ★ Unique Teacher Feature: "AI Class Assistant — Auto Lesson Planner"**

Teachers choose: - Topic - Class/grade level - Duration (days/weeks)

AI generates: - Complete lesson plans - Learning objectives - Teaching activities - Common student mistakes - Small quizzes per class - Predicted doubts students may ask

This drastically reduces planning time and is a standout feature compared to Google Classroom or other LMS platforms.

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## 6. Student Dashboard (URL: /student)

### 6.1 AI Doubt Solver

- Chat interface
- Step-by-step academic solutions
- Subject filters

### 6.2 Lecture Summariser

Students upload notes to receive: - Summaries - Key points - Flashcards - Short quizzes

### 6.3 Quiz Arena (Gamified Learning)

- AI-generated quizzes
- Teacher-assigned quizzes
- XP points
- Levels & streak rewards
- Weekly leaderboard

### 6.4 Assignments

- Students submit homework
- View marks & teacher feedback

### 6.5 Classes

- Students join classes using a unique code

### ★ Signature Feature: Explain My Mistake

A dedicated section where students upload their answers and get instant correction analysis.

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## 7. Teacher Dashboard (URL: /teacher)

### 7.1 Class & Student Management

- Create and manage sections
- Invite students

### 7.2 AI Quiz Generator

- Automatic quiz creation
- Difficulty control
- Explanations generated automatically

### 7.3 Assignment Manager

- Creation + AI evaluation
- Structured feedback

## 7.4 Analytics

- Topic mastery
- Class-level insights
- Individual student analysis

### ★ Signature Feature: AI Lesson Planner

A full AI-driven lesson planning assistant that provides: - Objectives - Activities - Mistakes students typically make - Practice questions - Best teaching flow structure

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## 8. System Architecture (High-Level)

- **Frontend:** Student & Teacher dashboards
- **Backend:** AI model orchestration, quiz engine, summarization engine
- **Database:** Classes, quizzes, assignments, analytics
- **AI Modules:**
  - Doubt Solver
  - Summarizer
  - Lesson Planner
  - Quiz Engine
  - Evaluation Engine (Explain My Mistake + Assignment checker)

## 9. Competitive Advantage

EduGame AI stands out from learning platforms because of: - Intelligent mistake analysis for students - AI-driven lesson planning for teachers - Fully gamified learning experience - Direct academic support (summaries, quizzes, evaluations) - Real-time feedback and performance analytics

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## 10. Conclusion

EduGame AI modernizes the entire learning and teaching ecosystem. By blending powerful AI features with a clean dashboard experience, the platform helps students learn better and teachers teach smarter. The system reduces workload, increases engagement, and ultimately improves academic performance.

EduGame AI isn't just a tool — it's a **complete academic assistant** for both teachers and students.