Virtual Study Platform

Abstract & Project Proposal

Abstract

The **Virtual Study Platform** is a web-based collaborative learning environment designed to enhance academic productivity. Featuring a specialized **collaborative code editor** with support for **10 essential programming languages**, this platform integrates:

- Real-time virtual classrooms with whiteboards
- **Multi-language code editor** (see supported languages below)
- Shared resource repositories
- Integrated Test Taking System
- Task management tools

Built on the **MERN stack** (MongoDB, Express.js, React, Node.js), the solution provides seamless coding practice and evaluation within a unified academic workspace.

Supported Programming Languages

The collaborative code editor will support these **10 academically essential languages**:

#	Language	Primary Academic Use
1	Python	Data Science, AI, Intro Programming
2	JavaScript	Web Development, Full-Stack Projects
3	Java	OOP Principles, Android Development
4	C/C++	System Programming, DSA
5	SQL	Database Management
6	HTML/CSS	Frontend Web Development
7	PHP	Server-Side Scripting
8	R	Statistical Computing

#	Language	Primary Academic Use
9	Swift	iOS Development
10	TypeScript	Advanced Web Applications

Code Editor Features

1. **Real-time Collaboration**
    - Multi-user editing with cursor tracking
    - Language-specific syntax highlighting
2. **Execution Capabilities**
    - Direct code execution for Python, JavaScript, Java
    - Output console with error highlighting
3. **Academic Tools**
    - Code snippet sharing between students
    - Version history for project submissions

Test System Integration

```
graph TB
A[Study Session] --> B{Coding Practice}
B --> C[Test Mode]
C --> D[Automated Grading]
D --> E[Performance Analytics]
```