K.R. MANGALAM UNIVERSITY

THE COMPLETE WORLD OF EDUCATION

PROJECT REPORT

EduLightHub :

EduLightHub - A Learning Platform for BTech Students

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1. Introduction

EduLightHub is an interactive and responsive e-learning platform specifically tailored for BTech students across various specializations. The goal is to create a centralized system that hosts course materials, monitors student progress, offers certificates, and promotes peer learning via interactive tools such as chatbots and voice assistance. With the rise in online learning post-pandemic, it becomes essential to build a reliable, visually appealing, and functional learning portal to meet modern educational demands.

2. Objective

- To develop a responsive and visually engaging platform using modern front-end technologies.

- To support real-time learning metrics visualization for student motivation.

- To simplify navigation and usability for both students and instructors.

- To integrate AI-powered chatbot interaction and speech-to-text notes for enhanced accessibility.

- To allow instructors to share materials and assignments, and students to download, upload, and track their learning journey.

3. Technologies Used

Frontend:

- HTML5: Structure of web pages.

- Tailwind CSS: Utility-first CSS framework for responsive design.

- JavaScript (ES6): For DOM manipulation and interactivity.

APIs & Libraries:

- Font Awesome: For icon support.

- Web Speech API: Voice input support.

- DOM Events: For UI interaction handling.

- Optionally extendable with Firebase/Node.js for backend integration.

Design Tools (Optional):

- Figma / Adobe XD: For UI/UX design planning.

- Visual Studio Code: Code editor used for development.

4. System Architecture

The platform is developed using a **Modular Component-Based Architecture, which divides the system into independent sections such as Dashboard, Course Catalog, Course Player, Certificate Section, Chatbot Assistant, and Authentication System.**

All components are fully responsive and scalable across screen sizes (desktop, tablet, mobile). Tailwind's grid and flex utilities are used extensively for layout management.

5. Features Implemented

5.1. Core Layout

- Sticky and responsive header navigation.

- Footer with contact links and social handles.

- Container-based layout using `container mx-auto` Tailwind utility.

5.2. Dashboard

- Provides real-time statistics:

- Courses in Progress

- Completed Courses

- Certificates Earned

- Learning Hours

- Visualized with cards, icons, and colored graphs.

- Overall completion shown as a progress bar.

5.3. Course Catalog

- Courses listed in grid format.

- Filters available for category (e.g., Programming, Networking) and level (Beginner, Intermediate, Advanced).

- Each course card displays:

- Course image

- Title and rating

- Duration and modules

- Enroll or Continue button

5.4. Course Content Page

- Contains the following sections:

- **Video Player: Streams video lectures.**

- **Tabbed Content: Lecture notes, quizzes, resources, and discussions.**

- **Side Navigation: Jump between modules.**

- **Instructor Info: Profile with contact link.**

5.5. Authentication System

- Login modal with email/password validation.

- Option to switch to Sign Up modal.

- Fully styled with focus and hover effects.

5.6. Chatbot Assistant

- Floating chatbot icon on the interface.

- Modal opens AI assistant for help.

- Keyword-based smart replies simulated.

5.7. Voice Input for Notes

- Accessible microphone button triggers browser speech recognition.

- Converts speech to text in the notes area.

5.8. Certificate Generator

- Visual list of earned certificates.

- Modal to preview, download, or share certificates.

5.9. Resource Upload and Sharing

- Form to upload files (notes, assignments, references).

- Metadata captured: Title, Type, Category, Description.

6. Implementation Details

All front-end functionalities are implemented using pure JavaScript and Tailwind CSS. DOM events handle modal toggles, dropdown menus, filters, and interactions.

Voice recognition and chatbot logic are simplified with conditional statements and `setTimeout` to mimic real-time responses.

7. Testing and Validation

Manual testing was performed across:

- Multiple browsers: Chrome, Firefox, Edge.

- Devices: Desktop, Android phone, iPad.

Test Cases:

- Login Modal Functionality

- Chatbot Responses

- Progress Calculation

- Course Filtering

- Note-Taking (Voice Input)

- Certificate Modal Preview

8. Future Scope

- User registration with backend authentication (Firebase/Auth0)

- Data storage using Firestore or MongoDB

- Upload assignments and get instructor feedback

- Machine Learning integration for chatbot answers

- Leaderboards for competitive learning

9. Conclusion

EduLightHub effectively showcases a modern learning environment with smart tools for students. The blend of visual analytics, interactive modules, and intuitive design makes it a

great candidate for real-world deployment in educational institutions.

10. Screenshots

(To be added manually by the user)

- Homepage with Navigation

- Dashboard with Progress Cards

- Course Cards with Filters

- Video Lecture Page

- Chatbot Assistant Interface

- Notes Section with Voice Input

- Certificate Gallery

11. References

- Tailwind CSS Documentation

- MDN Web Docs

- FontAwesome

- Web Speech API

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