

Minor Project Synopsis



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[INCLUSIVE LEARNING APP FOR ALL]

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Under the Guidance of
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Minor Project Synopsis

• **Profile of the Problem**

Problem: Shortage of Equitable Quality Education for all

SDG Goal no 4: Ensuring Inclusive and Equitable Quality Education

Background:

Education is a fundamental human right and a key driver of personal and societal development. However, millions of people worldwide are still denied access to quality education due to various barriers.

Key Challenges:

1. Accessibility Issues:

- Geographical Barriers: Remote areas often lack educational infrastructure.
- Disabilities: People with physical, sensory, or cognitive disabilities face challenges in accessing traditional educational resources.
- Financial Constraints: High costs of education and related materials are prohibitive for many families.
- Cultural Barriers: Gender biases, cultural norms, and language differences can limit access to education.

2. Quality of Education:

- Teacher Shortages: Many regions suffer from a lack of qualified educators.
- Resource Deficiency: Insufficient teaching materials, poor infrastructure, and outdated curricula hinder effective learning.
- Technological Gap: Lack of access to modern technology and internet connectivity prevents students from benefiting from digital learning resources.

3. Equity Issues:

- Marginalized Communities: Ethnic minorities, refugees, and displaced persons often face systemic barriers to education.
- Gender Inequality: Girls and women in some regions are disproportionately affected by lack of access to education.
- Inclusive Education: Mainstream education systems often fail to accommodate the diverse needs of all students, including those with disabilities.

• **Idea Proposed in the Project**

Project Proposal: Inclusive Learning App for All

Project Overview:

The goal of this project is to develop an educational app that provides accessible, high-quality learning opportunities for all individuals, including those who are deaf, hard of hearing, visually impaired, and with other disabilities. By leveraging multimedia content, assistive technologies, and user-friendly design, the app aims to make education inclusive and equitable for everyone.

Objectives:

1. Accessibility: Ensure all educational content is accessible to users with diverse needs.
2. Quality Education: Deliver high-quality educational resources that cater to various learning styles.
3. User Engagement: Create an engaging and interactive learning experience.
4. Inclusivity: Promote lifelong learning opportunities for individuals with different abilities.

● Unique Features

1. Multimodal Learning Content:

- Video Lessons: Include both closed captions and sign language interpretation.
- Audio Descriptions: Provide audio descriptions for visually impaired users.
- Interactive Visuals: Use infographics, animations, and interactive diagrams.

2. Personalized Learning Paths:

- Progress Tracking: Allow users to track their learning progress and set goals.

3. Gamification:

- Rewards & Badges: Incorporate a rewards system to motivate users.
- Leaderboards: Create a sense of community and competition with leaderboards.

4. Assistive Technologies:

- Text-to-Speech (TTS): Convert text content to speech for users with visual impairments.
- Speech-to-Text (STT): Allow users to dictate their responses and interact via voice.

5. Multilingual Support:

- Sign Language Variants: Offer content in multiple sign languages.
- Language Options: Provide content in various written languages to cater to a diverse audience.

6. Customizable User Interface:

- Accessibility Settings: Allow users to adjust font size, color contrast, and other accessibility options.
- User Themes: Offer customizable themes for a personalized experience.

7. Collaborative Learning:

- Discussion Forums: Enable users to participate in community discussions.
- Group Projects: Facilitate group activities and collaborative projects.

8. Resource Hub:

- Reference Materials: Provide access to eBooks, articles, and additional learning resources.
- Expert Webinars: Host webinars with subject matter experts.

9. Offline Access:

- Downloadable Content: Allow users to download lessons and resources for offline use.
- Progress Syncing: Ensure progress syncs automatically when the user is back online.

10. Inclusive Assessments:

- Multiple Formats: Offer quizzes and exams in various formats (e.g., visual, auditory).
- Accommodations: Provide accommodations like extended time for assessments.

11. Regular Updates & Notifications:

- Content Updates: Regularly update the app with new lessons and features.
- Notifications: Keep users informed about new content, events, and milestones

● **Project requirements**

Software Requirements:

Integrated Development Environment (IDE): Visual Studio, Android Studio, or Xcode for coding and debugging.

Version Control System: GitHub or GitLab for source code management and collaboration.

Database Management System: Firebase, SQLite, or MongoDB for storing user data, progress, and content.

Multimedia Tools: Adobe Premiere Pro or Final Cut Pro for video editing, and Adobe After Effects for animations.

Assistive Technology Tools: JAWS (Job Access With Speech) or NVDA (NonVisual Desktop Access) for screen reader compatibility testing.

API Integration: OpenAI API for AI-based personalization, Google Cloud Speech-to-Text and Text-to-Speech APIs for accessibility features.

Testing Tools: JUnit for unit testing, Selenium for automated testing, and Accessibility Insights for accessibility testing.

Deployment Platforms: AWS (Amazon Web Services) or Azure for cloud services, Google Play Store, and Apple App Store for app distribution.

Technology Stack:

Frontend Development:

Languages: HTML, CSS, JavaScript

Frameworks: React Native for cross-platform development, Angular for web applications.

Backend Development:

Languages: Python, Node.js, Java

Frameworks: Django, Express.js, Spring Boot

Mobile App Development:

Languages: Java/Kotlin for Android, Swift for iOS

Frameworks: Flutter for cross-platform development

Database:

SQL Databases: MySQL, PostgreSQL

NoSQL Databases: MongoDB, Firebase

Artificial Intelligence:

Libraries: TensorFlow, PyTorch

APIs: OpenAI, IBM Watson

Accessibility Tools:

Screen Readers: JAWS, NVDA

Speech Recognition: Google Cloud Speech-to-Text, Microsoft Azure Speech Service

Text-to-Speech: Google Cloud Text-to-Speech, Amazon Polly

- **Modules to be Implemented**

1. User Authentication & Profile Management Module

This module will handle user registration, login, and profile management. It will allow users to create accounts, log in securely, and manage their personal information.

Key Features:

- User registration and login
- Profile customization
- Password reset and recovery
- User authentication (email verification, two-factor authentication)
- User data encryption and protection

2. Multimedia Content Delivery Module

This module will provide video lessons, interactive visual aids, and audio descriptions. It will ensure that all content is accessible to users with diverse needs.

Key Features:

- Video player with closed captions and subtitles
- Sign language integration
- Infographics and animations
- Audio descriptions for visually impaired users
- Downloadable content for offline access

3. Interactive Quizzes & Assessments Module:

This module will provide interactive quizzes and assessments to reinforce learning. It will offer visual and auditory feedback and accommodate various learning styles.

Key Features:

- Multiple-choice and true/false quizzes
- Visual and auditory feedback
- Timed assessments
- Customizable quiz settings (difficulty level, number of questions)
- Progress tracking and reporting

4. Assistive Technologies Module:

This module will integrate assistive technologies to support users with disabilities. It will include text-to-speech and speech-to-text.

Key Features:

- Text-to-Speech (TTS)
- Speech-to-Text (STT)
- Screen reader support
- Customizable accessibility settings (font size, color contrast)

5. Personalization & Progress Tracking Module:

This module will allow users to create personalized learning paths and track their progress. It will use AI to offer content recommendations based on user preferences and performance.

Key Features:

- User profiles and progress tracking
- Personalized content recommendations
- Goal setting and achievements
- AI-driven learning paths
- Performance analytics and reports

6. Community Engagement Module:

This module will facilitate collaborative learning and community engagement. It will include discussion forums and group projects.

Key Features:

- Discussion forums and chat
- Group projects and activities
- Q&A sessions
- Community challenges and competitions
- Social media integration

● Application

Schools and Universities: Integrate the app into the curriculum to support students with disabilities.

Special Education Programs: Utilize the app to offer specialized content tailored to the needs of students with hearing, visual, and other impairments.

Benefits:

- Enhances the learning experience for students with diverse needs.
- Supports differentiated instruction and personalized learning.

Corporate Training:

Application:

Employee Training Programs: Companies can use the app to provide accessible training materials for employees with disabilities. It can be used for onboarding, skill development, and compliance training.

Diversity and Inclusion Initiatives: Promote inclusivity in the workplace by offering training on diversity, equity, and inclusion.

Benefits:

- Ensures all employees have equal access to training and professional development opportunities.
- Fosters an inclusive workplace culture.
- Improves employee engagement and retention.

● References

1. Sign Language Resources:

- SignSchool: www.signschool.com
- ASL Bloom: www.aslbloom.com
- The ASL App: www.theaslapp.com

2. Assistive Technologies:

- Google Cloud Text-to-Speech: cloud.google.com/text-to-speech
- Google Cloud Speech-to-Text: cloud.google.com/speech-to-text
- Microsoft Azure Speech Service: azure.microsoft.com/services/cognitive-services/speech-service
- Amazon Polly: aws.amazon.com/polly

3. AI for Sign Language:

- Signapse AI: www.signapse.ai
- FlexClip: www.flexclip.com

4. Accessibility Guidelines and Tools:

- Web Content Accessibility Guidelines (WCAG): www.w3.org/WAI/standards-guidelines/wcag
- JAWS (Job Access With Speech): www.freedomscientific.com/products/software/jaws
- NVDA (NonVisual Desktop Access): www.nvaccess.org
- Accessibility Insights: accessibilityinsights.io

5. Project Management and Development:

- Visual Studio: visualstudio.microsoft.com
- Android Studio: developer.android.com/studio
- Xcode: developer.apple.com/xcode
- GitHub: github.com
- Firebase: firebase.google.com
- MongoDB: [mongodb.com](https://www.mongodb.com)

6. Learning App Examples:

- Khan Academy: www.khanacademy.org
- Duolingo: www.duolingo.com