LearnHub: Project Report

1. INTRODUCTION

1.1 Project Overview

LearnHub is an online learning platform (OLP) that enables students and educators to collaborate through course creation, enrollment, learning, and certification. It supports multiple user roles including learners, educators, and admins.

1.2 Purpose

To create an interactive and accessible digital platform that promotes flexible and skill-based learning through self-paced courses, real-time tracking, and educator-driven content.

2. IDEATION PHASE

2.1 Problem Statement

Despite the rise of e-learning, learners face issues such as limited course accessibility, lack of regional language support, and non-personalized content. Educators lack an easy-to-use system to publish and manage content.

2.2 Empathy Map Canvas

User: Sarah, a college student interested in web development

- **Says:** "I want to learn skills that actually help me get a job."
- **Thinks:** "Learning from home is convenient, but I want guidance and structure."
- **Does:** Browses courses, watches video lectures, asks questions in forums.
- **Feels:** Motivated when progress is visible; frustrated with incomplete or low-quality courses.

2.3 Brainstorming

Key ideas brainstormed:

- Seamless registration and login for all user types
- Personalized dashboard for learners and educators
- Real-time progress tracking and completion badges
- Multilingual content for regional learners
- Educator support to create structured and rich course content
- Admin tools to moderate and oversee the platform

3. REQUIREMENT ANALYSIS

3.1 Customer Journey Map

1. User visits LearnHub homepage
2. Registers or logs in
3. Browses or searches courses
4. Enrolls in course
5. Learns using videos, chapters, and assignments
6. Marks progress and attends webinars
7. Completes course and receives certificate
8. Gives feedback and explores new courses

3.2 Solution Requirement

Functional Requirements:

- User Registration & Login
- Course Creation & Enrollment
- Video Upload & Course Structure (chapters/pages)

- Multilingual Access
- Certification Generation
- Feedback Mechanism

Non-Functional Requirements:

- Secure Authentication (JWT)
- Responsive and Mobile-Friendly UI
- Fast API Performance
- Scalable Architecture
- Role-Based Access Control

3.3 Data Flow Diagram

Level 1 DFD:

- User interacts with Frontend (React.js)
- Frontend sends API requests to Backend (Express.js)
- Backend communicates with MongoDB to retrieve or update data
- Response sent back to Frontend for rendering

3.4 Technology Stack

Frontend: React.js, Vite, Material UI, Bootstrap**Backend:** Node.js, Express.js**Database:** MongoDB with Mongoose**Additional Tools:** Axios, bcryptjs, JWT, Multer, Dotenv, Nodemon

4. PROJECT DESIGN

4.1 Problem Solution Fit

The platform bridges the gap between learners seeking flexible education and educators wanting to share knowledge. LearnHub allows learners to access diverse content at their pace and empowers educators with intuitive tools.

4.2 Proposed Solution

LearnHub is a full-stack MERN-based platform offering course hosting, interactive learning tools, certification, and admin monitoring to ensure content quality and user support.

4.3 Solution Architecture

- **Client-Server Model** with RESTful APIs
- **React Frontend** with Vite bundler
- **Express Backend** for API routing
- **MongoDB Database** to store users, courses, and enrollments
- **JWT Authentication** for secure login
- **Multer** for file uploads (e.g., videos, certificates)

5. PROJECT PLANNING & SCHEDULING

5.1 Project Planning

Project divided into 4 sprints:

- **Sprint 1:** User auth, course listing, basic UI
- **Sprint 2:** Educator panel, video upload, chapter/page structuring
- **Sprint 3:** Multilingual access, learner progress tracking
- **Sprint 4:** Certification, admin monitoring, feedback collection

6. FUNCTIONAL AND PERFORMANCE TESTING

6.1 Performance Testing

- **Tools used:** Postman, Chrome DevTools

- **Test cases:** API load testing, UI responsiveness, file upload stress testing
- **Outcome:** Stable performance for up to 100 simultaneous users; course load time under 2s

7. RESULTS

7.1 Output Screenshots

- Registration/Login Page
- Learner Dashboard with Course List
- Educator Panel to Upload Course
- Admin Panel with Reports
- Certificate Download Page

8. ADVANTAGES & DISADVANTAGES

Advantages

- Real-time progress tracking
- Multi-role user support
- Scalable and responsive architecture
- Certification and feedback features

Disadvantages

- No offline course access
- Requires onboarding for new educators
- Limited live session capability (future scope)

9. CONCLUSION

LearnHub provides a robust platform for flexible learning, empowering both learners and educators. The system's modularity and tech stack make it adaptable and scalable for future educational innovations.

10. FUTURE SCOPE

- Mobile Application version
- Live video classrooms and chat integration
- AI-powered course suggestions
- Progress gamification and leaderboard

11. APPENDIX

Source Code: Available in GitHub repo**Dataset Link:** Not applicable – dynamic user-generated content**GitHub & Project Demo Link:** ⊕ **GitHub - PoosaPoojitha/learhub-create-center-for-skill-enhancement**