AI Internship IBM SkillsBuild

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Concept Note: To develop an AI-powered educational agent capable of analyzing learner performance data and generating personalized learning paths.

Introduction:

The Indian education system, while extensive, often follows a standardized approach that overlooks the diverse learning needs of individual students. This generalization leads to unequal learning outcomes, particularly affecting students from marginalized and under-resourced communities. To address these challenges, this project introduces an AI-powered mobile application designed to improve the quality of education by offering personalized, adaptive learning experiences.

The app utilizes artificial intelligence to analyze each student's performance, identify learning gaps, and recommend tailored learning paths and resources. It also assists educators by providing actionable insights to enhance curriculum delivery and teaching strategies. Through real-time progress tracking, early detection of difficulties, and curated educational content, the app empowers both students and teachers.

By making education more inclusive, data-driven, and student-centric, this solution aims to strengthen the Indian education system and contribute to Sustainable Development Goal 4: Quality Education for all.

Problem Statement:

The primary challenge addressed by this project is the lack of personalized and inclusive learning within the Indian education system. Traditional teaching methods are largely uniform and do not adapt to the diverse learning styles, paces, and needs of individual students. This often results in learning gaps, low engagement, and poor academic outcomes—particularly among underprivileged and rural populations.

Despite efforts to expand access to education, the quality and effectiveness of instruction remain inconsistent across different regions and socioeconomic groups. There is a critical need for a scalable, intelligent solution that supports educators, identifies learning difficulties early, and provides customized learning experiences.

This project leverages Artificial Intelligence to bridge these gaps by creating a personalized learning platform that enhances educational outcomes, improves teaching strategies, and ensures equitable access to quality education for all learners.

Objective:

The main objective of this project is to enhance students' motivation to learn by providing a personalized and engaging study experience. By leveraging artificial intelligence, the website adapts to individual learning styles, tracks progress, and delivers customized educational content. This approach supports the goals of SDG 4: Quality Education by promoting inclusive, equitable, and student-centered learning, especially for underprivileged and diverse learners.

Why this problem:

The current education system, particularly in many developing regions, is often generalized and outdated and fails to effectively meet the diverse learning needs of individual students. As a result, many students fall behind because teaching methods are not tailored to their unique learning styles. Additionally, underprivileged communities frequently lack access to quality learning materials and support systems.
We are addressing this problem because:

- Students are unable to learn at their own pace or in a way that suits their style.
- Many teachers lack the tools necessary to identify learning gaps early on.
- The digital divide restricts educational opportunities for rural and marginalized communities.

Overview:

We built a **Subject-Wide Learning App** designed to simplify and strengthen foundational learning across **Math, Science, Computer, and English**. Each subject features structured **Resources**, curated **Videos**, and an **Interactive Quiz System** for hands-on learning.

The platform emphasizes **modularity**, **user-friendly navigation**, and **smart backend integration** with **Relay AI**—enabling real-time analysis, feedback automation, and personalized learning paths.

Core Features:

1. **Multi-Subject Support-**

Subjects: English, Math, Science, Computer

- Each subject follows the same standardized format for ease of use and development.

2. **Level-Based Learning-**

- Divided into three difficulty levels: Basic, Intermediate, Advanced
- Ensures progressive mastery of content.

3. **Content Modules-**

3.a. Resources Tab

- Static or downloadable reference material (PDFs, guides, notes)
- Organized by subject and topic.

3.b. Videos Tab

- Embedded or linked educational videos
- Optional: Playlist-style content delivery

3.c. Quiz Tab

- Dynamic quiz engine with:
  - **i.** Topic-based questions
  - **ii.** Multiple choice format
  - **iii.** Instant feedback

Questions stored in structured JSON files, categorized by subject, level, and topic

4. **AI Integration with Relay.app-**

4.a. Smart Submission
• Sends quiz results to Relay after user completion.

4.b. Weak Topic Detection
• Analyzes answers to identify weak areas.
• Uses topic tags from the JSON structure for precision.

4.c. Automated Feedback (PDF)
• Relay generates a personalized PDF report highlighting weak topics.
• Automatically emailed to the student or stored for teacher/admin access.

4.d. AI-Generated Practice Questions
• Based on user performance, Relay triggers an AI model to generate new, targeted

practice questions.
• These questions are immediately available to reinforce weak topics and promote mastery.

Technical Design Features-

5.a. Modular JSON Structure

- Easy to update or add new questions per subject/level
- Keeps frontend fast and backend light

5.b. Scalable Architecture

- Can plug in more subjects or quizzes without altering core structure

5.c. Responsive UI

- Works on desktop and mobile
- Clean, modern design using basic HTML/CSS

Tech Implementation:

1. **Frontend Design and Structure**
   Developed a responsive, modular user interface using HTML, CSS, and JavaScript. A tab-based layout organizes content by subject, each containing *Resources*, *Videos*, and *Quiz* sections for intuitive navigation across devices.
2. **Data Storage and Integration**
   Quiz questions are stored in structured JSON files categorized by subject and level. Each entry includes the question, answer choices, correct response, and topic. These are loaded dynamically into the quiz interface to ensure flexibility and scalability.
3. **User Interaction and Answer Processing**
   User responses are evaluated in real time. Incorrect answers are logged by topic, allowing the system to identify weak areas and prepare data for backend processing and personalized feedback.
4. **Backend Automation with Relay**
   Relay.app is integrated as the backend automation tool. Upon quiz completion, a webhook sends subject, level, and missed topics to Relay. Relay then automates workflows including:
   a. Generating personalized PDF feedback
   b. Sending extra practice questions based on weak topics
   c. Providing relevant study resources or links for improvement
   d. Optionally tracking performance metrics over time
5. **Multilingual Support and Future Integration**
   The system is designed for multilingual question support, making it accessible to a broader audience. Its modular architecture allows seamless integration of future features, such as speech-to-text, advanced analytics, or AI-driven tutoring.

Why Relay:

Relay is a **no-code autmation platform** that integrates seamlessly with webhooks, making it ideal for projects requiring **real-time data handling without a dedicated backend server**.

Key Benefits:

- **Instant Quiz Data Processing:**
  Relay receives quiz results via webhooks and triggers automated flows—extracting weak topics, generating personalized PDF feedback, and emailing or storing reports.
- **Customizable and Scalable:**
  Its modular design supports custom workflows and scales effortlessly with user growth, ensuring minimal technical overhead.
- **AI-Ready Integration:**
  Relay can connect with AI tools to enable intelligent features such as auto-generating questions or tracking learning progress.
- **No-Code Efficiency:**
  Enables fast development and collaboration, even with limited backend expertise.

In essence, Relay offers a lightweight, scalable alternative to traditional backend solutions—perfect for fast, intelligent educational tools.

Conclusion:

This project bridges learning gaps by combining foundational subject content with AI-powered personalization. Through interactive resources, automated feedback, and dynamic question generation via Relay AI, students receive a tailored and effective learning experience.

The system supports **Quality Education (SDG 4)** by enhancing accessibility, adaptability, and engagement. Simultaneously, it aligns with **Industry, Innovation, and Infrastructure (SDG 9)** through its use of scalable, no-code automation, reducing backend complexity and promoting tech-forward development.

With a modular design and room for future growth, the platform is built to evolve—making education more inclusive, intelligent, and impactful.