Internship Challenge: AI-Powered Vocational Learning Assistant

1. Project Overview

The objective of this 7-day challenge is to design and develop a full-stack web application that serves as an **Interactive Quiz and Learning Assistant** specifically tailored for students in **ITI (Industrial Training Institute)** and **Diploma** programs in India. This tool aims to bridge the gap in high-quality, interactive learning resources for vocational trades such as Fitter, Electrician, and Welder.

The core of this project is to demonstrate how modern web technologies (Next.js, TypeScript, PostgreSQL) and Generative AI can be combined to create a personalized learning experience. We are not just looking for a finished product; we are evaluating your **approach, code quality, and ability to learn and execute** within a week.

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2. Core Requirements

A. User Authentication and Dashboard

- Implement a secure user registration and login system using email and password.
- Create a personalized dashboard where students can view their quiz history, scores, and progress over time.

B. Trade and Topic Selection

- Provide an interface for users to select their specific trade (e.g., **Fitter** or **Electrician**).
- Within each trade, allow users to choose from various modules such as **Safety Practices**, **Hand Tools**, or **Basic Electricity**.

C. AI-Powered Quiz Interface

- **Dynamic Question Generation:** Use a Large Language Model (LLM) to generate multiple-choice questions (MCQs) on the fly based on the selected topic.
- **Interactive Feedback:** Provide immediate feedback for each answer. If a student gets a question wrong, the AI should explain *why* the correct answer is right.
- **Learning Assistant:** Include a "Hint" or "Explain" button for every question, allowing the AI to act as a personal tutor.

D. Technical Stack

- **Frontend:** Next.js (App Router), React, TypeScript, Tailwind CSS.
- **Backend:** Next.js API Routes or a separate Node.js server.
- **Database:** PostgreSQL (for storing users, quiz attempts, and scores).
- **AI Integration:** OpenAI API, Google Gemini API, or any other LLM provider.

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3. Knowledge Base and Resources

To ensure the AI generates relevant and accurate content, you should ground its knowledge in the official Indian vocational curriculum. Use the following resources as your primary knowledge base:

Resource Name	Description	Link
Bharat Skills Portal	The central repository for NSQF curriculum, study materials, and question banks.	bharatskills.gov.in
Fitter Trade Resources	Specific curriculum and question banks for the Fitter trade.	Fitter Study Material
Electrician Trade Resources	Specific curriculum and question banks for the Electrician trade.	Electrician Study Material
NIMI Learning Online	Standard instructional media and e-learning materials for ITIs.	nimilearningonline.in

Sample Topics for AI Priming:

- **Fitter:** Safety Signs, PPE, Vernier Calipers, Micrometers, Filing, Drilling, and Marking Tools.
- **Electrician:** Ohm's Law, Wiring Circuits, Transformers, Electrical Safety, and Hand Tools.

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4. Evaluation Criteria

We will be assessing your performance based on the following pillars:

1. **Learning Agility:** How quickly you grasp and implement Next.js and TypeScript concepts.
2. **Code Craftsmanship:** Clean, modular, and well-documented code. We value readability and maintainability.
3. **Git Discipline:** A clear, descriptive commit history that reflects your step-by-step development process.
4. **Problem Solving:** Your ability to handle edge cases, such as AI hallucinations or database connection issues.
5. **User Experience:** A clean, intuitive, and responsive UI that caters to the needs of students.

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5. Bonus Challenges (Optional)

If you complete the core requirements early, consider adding:

- **Document Upload:** Allow users to upload a PDF (e.g., a specific chapter) and generate a quiz based on that document.
- **Voice Assistant:** Add a text-to-speech feature for the AI's explanations to help students with different learning styles.
- **Leaderboard:** A global leaderboard to encourage healthy competition among students.

Good luck, Siddharth! We are excited to see your approach and the tool you build.