**DESIGN AND DEVELOPMENT OF AN ENHANCED E-LEARNING PLATFORM FOR AN INTERACTIVE EDUCATIONAL EXPERIENCE**

**Introduction**

This research proposal focuses on the development of an interactive educational platform for universities, incorporating features such as access to university resources, assessment tools, quizzes, attendance tracking, and online live lecture streams via video conferencing. The aim is to create a comprehensive e-learning solution that addresses the challenges faced by students not only in our university but also in other tertiary institutions across Ghana. The proposed platform seeks to overcome issues related to the quality of educational resources and the limited availability of effective online learning tools, common concerns experienced by students in our region and other African countries.

**Background and Rationale**

The educational environment in both local and African contexts presents considerable challenges, particularly in remote regions where students grapple with obstacles in accessing top-tier educational materials and participating in online learning. Acknowledging these challenges, the envisioned e-learning platform aims to overcome these barriers by offering an all-encompassing and accessible solution. The goal is to create a user-friendly platform that addresses the diverse needs of students across different education levels, fostering inclusive learning experience.

**Objectives of the Platform:**

The primary objectives of the proposed platform include:

* Offering a centralized repository of high-quality educational resources.
* Enhancing access to online learning materials for students in remote areas.
* Facilitating a seamless and interactive online learning experience.

**Features and Functionalities:**

The platform is designed to incorporate a range of features aimed at improving the overall online learning experience. These include:

* Course management functionalities for lecturers to share teaching materials and resources.
* A live streaming platform for virtual lectures, with recorded sessions for accessibility.
* Robust communication tools, including real-time chat and scheduling options for virtual meetings with lecturers.
* An integrated module for conducting online assessments with built-in plagiarism detection.
* Timetable management and alert systems to keep students informed of class schedules and updates.

**Tech Stack**

1. Backend Development:
   1. NodeJS - Node.js will be employed for its efficiency in handling asynchronous tasks and facilitating fast and scalable server-side development.
   2. Express.js - This web application framework for Node.js will streamline the development of robust and scalable APIs.
2. Database:
   1. MongoDB: The NoSQL database, MongoDB will be utilized to store and manage data. Its flexibility and scalability makes it suitable for this project.
3. Templating Engine:
   1. EJS (Embedded JavaScript): EJS will serve as the templating engine for rendering dynamic content on the server-side, allowing seamless integration of data into HTML templates.
4. File Upload:
   1. Multer: This middleware for handling file uploads in Node.js will be integrated to manage documents, multimedia files, and other resources uploaded by users.
5. Real-time Communication:
   1. Socket.io: For real-time, bidirectional communication between the server and clients, Socket.io will be implemented. This is crucial for features like live chat and interactive online lectures.
6. Testing:
   1. Jest: As a JavaScript testing framework, Jest will be employed for unit testing to ensure the reliability and stability of the platform.
7. Version Control:
   1. Git & GitHub: The platform's source code will be managed using Git for version control, with GitHub serving as the remote repository.
8. Deployment:
   1. Heroku: The platform will be deployed on Heroku, a cloud platform that offers seamless deployment, scaling, and management of applications.
9. Agile SDLC:
   1. Iterative and Incremental Development
   2. Flexibility and Adaptability
   3. Early and Regular Deliverable