

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

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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 modern landscape of higher education is undergoing a dramatic shift towards digital platforms, begging the need for innovative solutions to meet the evolving needs of students and educators. This research proposal stems from the recognition of persistent challenges faced by students in tertiary institutions across Ghana. The absence of a comprehensive e-learning solution has contributed to a gap in effective online learning tools. This gap is worse in remote regions, echoing the broader concerns experienced by students within our region as well as other African countries.

The proposed interactive educational platform emerges as a response to these challenges, intending to redefine the educational experience for university students. The platform aspires to be a holistic e-learning solution by integrating features such as access to university resources, assessment tools, quizzes, attendance tracking, and live lecture streams via video conferencing. This endeavour

is not limited to our university; rather it extends its impact to tertiary institutions across Ghana.

The rationale for this initiative is rooted in the belief that a well-crafted e-learning platform can extend beyond geographical barriers and provide everyone access to high-quality online education, fostering academic excellence and engagement. In doing so, it aspires to contribute to advancing education in our region and in the African continent as a whole.

OBJECTIVES

The primary objective of the platform include:

- Providing a centralized repository of high-quality educational resources. (E-library)
- Enhancing access to course materials for students
- Facilitating a seamless and interactive online learning experience.

LITERATURE REVIEW

Modern e-learning platforms face challenges due to the discrepancies between traditional pedagogical approaches and the online learning environment. Currently, there exists a trend towards simplifying the transfer of traditional teaching methods into digital spaces, prioritizing convenience and accessibility in line with the fast-paced nature of modern "cyber culture".

However, concerns arise that this simplistic adaptation of traditional teaching methodologies into online settings may not fully leverage the potential of digital platforms. Some scholars highlight the potential mismatch between the prescribed minimum engagement level for online instructors (daily discussion board visits) and the expectations fostered by a culture valuing constant connectivity and immediate feedback.

Some scholars propose that instructors should maintain a robust presence on online platforms, to actively guide discussions, provide timely feedback, and prevent student disengagement. This perspective emphasizes the need for an immersive and interactive learning environment that capitalizes on modern technology to cultivate innovative teaching and learning experiences.

In conclusion, while current e-learning platforms strive to simplify existing educational paradigms for online consumption, there is a growing consensus that this approach might be limiting. The proposed interactive e-learning platform aligns with

this call for more sophisticated environments that leverage technological advancements to enhance pedagogical practices.

METHODOLOGIES AND TECHNIQUE

We aim to employ an Agile Development methodology, specifically Scrum, to facilitate iterative and incremental development.

This approach allows for flexibility in evolving user requirements. Development will follow industry best practices, utilizing NodeJS for back-end development, MongoDB for the database, and integrating technologies such as Socket.io for real time communication, MulterJS for File Management as well as EJS (Embedded JavaScript) for HTML templating.

WORKFLOW

1. Project Initiation - Define the project scope, objectives and requirements.
2. System Architecture Design - Illustrate a high-level structure of the system, showcasing the various components and their relationships.
3. Database Design
4. Design of Entity Relationship Diagram (ERD) - Illustrate the relationship between different entities in the system.
5. Design of Use Case Diagram - Describe interaction between actors and the system.
6. Front-end and Back-end Development - Design and development of user interfaces and back-end functionalities.
7. Integration of features - Implementation of assessment tools, quizzes, attendance tracking, and video conferencing.
8. Testing and Quality Assurance
9. Deployment.

SCHEDULE FOR COMPLETION:

Project Timeline:

Start Date: February, 2024

End Date: September, 2024

MILESTONE DATES:

Project Initiation and System Design - February 2024

Front-end and Backend Development - March, April 2024

Database Design and Implementation - May 2024

Integration of Features - June, July 2024

Testing and Quality Assurance - August 2024

Deployment - September 2024

RESOURCES AND TOOLS

- Draw.io for diagrams
- NodeJS and ExpressJS for back-end
- C and Python for data processing
- MongoDB for Database Management
- EJS as a templating engine for the front-end
- Socket.io for real-time communication
- Jest for unit testing
- Git and GitHub for version control
- Heroku for deployment and hosting.

CONCLUSION

The proposed interactive learning platform for universities, aims to address the existing challenges faced by students in our universities and beyond, extending its positive impact to tertiary institutions across Ghana and other African countries. The proposed platform, designed to encompass essential features such as resource access, assessment tools, quizzes, attendance tracking, and live lecture streams, is a strategic response to the pressing need for an advanced e-learning solution. It signifies a transformative step towards inclusive, high-quality education, contributing to the broader advancement of learning experiences and academic excellence.