Design and Implementation of a Collaborative Academic Platform with Inter-University Leader board Competitions

CHAPTER 1

INTRODUCTION

1.1 Background to the Study

Collaborative learning in an academic environment involves participating in discussions, problem-solving, and studying in groups (The University of Queensland, Australia, n.d.). The bedrock of this learning approach is shared knowledge. In higher education, creating a space where learners can share ideas, questions, and teaching materials regardless of their skills and abilities ensures that they are properly engaging with new information and contributing to the learning process.

Education is being revolutionised through the use of technology, (Herrera-Pavo, 2020) stated that Information and Communication Technologies (ICTs) favour collaboration in a learning situation. It is important to move on from a teaching system that embraces a traditional pedagogical approach, which leaves students with little space to think, as the teacher is the centre of the student-teacher relationship (Hu, 2024).

With peer-to-peer interaction, there is a parallel relationship rather than a vertical one, and this makes students feel comfortable seeking support and challenging themselves academically.

However, many Nigerian students struggle to access quality course materials outside of their respective universities. Their learning is often limited because access to past questions, lecture notes, and peer assistance is only dependent on their personal network. This project aims to fill this gap by providing a platform where students across Nigerian universities can share and access course materials, discuss academic topics, form study groups, and participate in inter-university competitions. The platform encourages collaboration and student engagement.

1.2 Statement of the Problem

In most Nigerian universities, 15-30% of the infrastructure and equipment used in are outdated (Garba, 2023). These infrastructures include, but are not limited to, online learning platforms, libraries with physical and digital resources, research, and academic support services. Students often rely on decentralized networks confined within their universities such as class groups or departmental assocaitions for knowledge exchange. The lack of collaboration among univerisities can weaken knowledge communities and reduce opportunities for peer learning.

Additionally, theres little emphasis when it comes to fostering healty competition between students In different univerisites. Competitions are capable of motivating students to participate actively during learning and it also sharpens their problem-solving skills. Despite this, most learning platforms skip out on implementing competitive features or keep them confined to institutional boundaries. Therefore, not engaging students in competitions which allow them to learn while dealing with real challenges creates a gap in the necessary skills and knowledge they should have acquired.

Without a centralised platform where students can share knowlwdge from diverse persepectives and participate in quizzes and competitons, many students are left feeling discouraged and you end up with a learning experiece that feels disjointed.

1.3Aim and Objectives

This study aims to design and implement an collaborative academic platform with inter-university leader board competitions

Objectives:

1. To create a user interface where students across Nigerian univerisities can share and access academic materials.
2. To create a database of questions to create quizzes and academic competitions.

3. To provide an efficient user management system that allows administrators to oversee student activities, monitor their performance, and evaluate engagement for continuous platform improvement.

4. To implement a leaderboard ranking system for academic competitions across institutions.

1.4 Scope of the Project

The scope of this project is to create a platfrom where computer science students from any Nigerian University can interact with each other, share information and materials, and participate in competitions/quizzes to be ranked on a leaderboard.

The system will be developed as a web-based application that can be accessed on desktop or mobile browsers. This project is focused on delivering a functional MVP (Minimum Viable Product) that ensures structure, usability, and collaboration.

1.5 Limitations of the Project

The limitations of this project are:

1. The platform will not provide robust learning progress analytics for each user.
2. Stable internet connection is required to use the platfrom.
3. Limited academic material and quiz database at the beginning stages.
4. Due to the novelty of the system, it may take time attract users across uiverities.

1.6 Significance of the Project

The purpose of this project is to identify the need for a centralised area where students are able to communicate with their peers regardless of location, share materials related to their courses, and test their abilities.

The importance of peer-to-peer studying is constantly being highlighted, and with the boom of education technology in the past 5 years, this platform will create a modern approach to learning.

Additionally, giving users the means to upload and access lecture notes, past questions, and relevant study material provides them with tools for learning, understanding, and preparing for tests and examinations. They can then proceed to test their knowledge using the in-built quiz generator that converts MCQ(Multiple Choice Question) past papers into timed quizzes or participate in challenges and competitions to be ranked individually on the leaderboard.

These features motivate them and ensure that the users are actively involved during learning because it is centred on the students' participation, which encourages education beyond the traditional classroom setting.

1.7 Project Risk

**Table 1.1 - Risk Assessment**

|  |  |  |
| --- | --- | --- |
| RISK DESCRIPTION | MITIGATION | IMPACT |
| Students on the platform are inactive e.g. low participation in competitions, no conversations in the discussion forum etc. | Add gamification such as point system, challenges, and leader-boards to encourage healthy competition and participation. | High |
| Users uploading innapropriate content | Implement an admin panel that reviews all content and a flagging system that detects and flags suspicious activity. | High |
| Difficulty verifying students from multiple universities | Users should be required to upload their valid school identification cards for verification | High |
| Scalability issues from growing number of users and contents which may affect system performance. | Use efficient database structure, pagination, and content-based indexing | High |
| Timeline may be too short to complete all the features | Prioritize a MVP | Medium |

1.8 Swot Analysis

**Table 1.2 - SWOT Analysis**

|  |  |
| --- | --- |
| STRENGTHS | WEAKNESSES |
| Encourages students to engage with their peers and learn from them  Connects students all over the country  Promotes learning and healthy competition through gamification (i.e. challenges, leaderboard) | Initial users may not have enough content to leverage because more users are yet to join to upload materials and start discussions  The subjective opinion of many users from multiple schools may lead to misinformation  Auto generated quizzes and challenges that are not multiple choice questions have to be manually reviewed which may cause delays in grading |
| OPPORTUNITIES | THREATS |
| It can be expanded to accommodate other education levels (i.e. Junior Secondary School, Senior Secondary School)  Students build long lasting networks and connections over time  Users at the top of the leader-board could stand a chance to win physical rewards. It will encourage them to join competitions and work hard.  Collaborating with universities to increase student adoption. | Users in areas with bad network may nit have steady access to the platform  Harmful posts and inappropriate content may be uploaded putting other users at risk.  Competition from other Edtech companies  - User data like login info may be at risk. |

1.9 Organization of the Project

Chapter 1: Introduction

Overview of the project, including background, objectives, problem statement, and risk assessment.

Chapter 2: Literature Review

It explores related works and gaps in online collaborative academic platforms.

Chapter 3: Methodology

This chapter covers the system requirements, system architecture, and the design approach.

Chapter 4: Implementation and Testing

Details the application development and testing process. Outlines the tools, framework, code, and test cases used when building the system.

Chapter 5: Conclusion

Summarises the project, key findings, and suggestions for future improvement.