TRIBHUVAN UNIVERSITY

Faculty of Humanities and Social Science

SKILLUP - AN E-LEARNING MANAGEMENT SYSTEM
A PROJECT REPORT

Submitted to

Department of Computer Application

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**In partial fulfillment of the requirements for the
Bachelors in Computer Application**

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1. Introduction

E-Learning is education imparted via the Internet, network, or standalone environment. E-Learning is a network-enabled conveyance of skills and knowledge. It stands for education through any kind of electronic media, primarily through the application of the Internet. E-Learning is an electronically supported learning system that uses the Internet for interaction between students and lecturers, and for the distribution of course material. Several factors spurring market growth include the rising demand to reduce the cost of education, increasing government initiatives backing online education, and the growing penetration of smartphones and the Internet. Additionally, the demand for adaptive learning is expected to drive market growth. However, the abundance of free content and lack of awareness can pose challenges.

Many proponents of E-Learning argue that basic knowledge of Information Technology is essential to use it as a medium to achieve educational goals. The evolution of humanity in the 20th century has transitioned from the Industrial Age to the Information Age and Knowledge Age. Knowledge is pivotal to the success and survival of organizations in today's rapidly changing and competitive world. Efficient acquisition, storage, transfer, retrieval, application, and visualization of knowledge are critical for organizational success.

E-Learning bridges the gap between learning and work, as workers use the same tools and technology for both. This integration makes it easier for employees to incorporate learning into their work. Both employers and employees believe E-Learning reduces the gap between work, home, and learning. Organizations investing in improving employees' skills and capacities, especially in rapidly changing environments like medical and healthcare settings, face a growing demand for training and retraining workers in new technologies, products, and services. Effective knowledge management ensures accessibility for all stakeholders.

SkillUp is a digital delivery platform for learning and training, conducted through electronic devices such as computers, tablets, or smartphones connected to the Internet. It offers convenience, allowing users to learn anytime, anywhere, with minimal restrictions. SkillUp provides training in courses such as Machine Learning, Programming Languages, and Video Editing, offering both individual and group classes that enable real-time interaction between students and lecturers.

2. Problem Statement

The existing system restricts students to lecture-based resources, limiting performance due to restricted material access. Key issues include:

- Assignment submissions via hard copies or personal emails.

- Help-seeking limited to lecturers' physical presence.

- New lecturers independently sourcing materials.

- Mandatory classroom attendance, conflicting with other responsibilities.

- Lack of platforms for monitored resource sharing and group discussions.

3. Objectives

This project aims to design, develop, and implement "SkillUp," a centralized web-based E-Learning platform to address traditional system limitations, providing an interactive environment for students and lecturers. Specific objectives include:

- Creating a centralized resource repository for course materials.

- Designing an intuitive, user-friendly interface.

- Enhancing student-lecturer communication and interaction.

- Enabling course enrollment and material access for students.

- Allowing lecturers to create and manage courses.

4. Literature Review

The literature on e-learning platforms and related educational technologies provides a strong foundation for understanding the evolution, benefits, and challenges of digital learning systems like SkillUp. This review synthesizes key insights from existing studies, focusing on electronic feedback mechanisms, collaborative learning, personalized adaptive systems, open-source learning management systems (LMS) and recent systematic reviews on e-learning strategies in higher education.

Ware and Warschauer [1] explore the role of electronic feedback in second-language writing within the broader context of e-learning environments. They argue that digital tools facilitate more timely and iterative feedback compared to traditional paper-based methods, allowing instructors to provide detailed comments that students can revise in real-time. This approach not only improves writing skills, but also fosters a more engaging learning process by integrating technology into the feedback loop.

Building on collaborative aspects, Warschauer [2] examines computer-mediated collaborative learning, emphasizing how networked technologies enable group interactions that transcend physical classrooms. For SkillUp, this supports the objective of enhancing student-lecturer and peer communication through forums, group classes, and monitored discussions.

Aroyo et al. [3] delve into interoperability in personalized adaptive learning, a critical feature for modern e-learning platforms. They discuss how standardized protocols allow different systems to exchange data seamlessly, enabling adaptive content delivery tailored to individual learner needs.

In terms of practical implementation, Aydin and Tirkes [4] review open-source learning management systems for e-learning and mobile learning (m-learning). They evaluate platforms like Moodle and Sakai, praising their cost-effectiveness, scalability, and support for multimedia content delivery via smartphones and the internet. More recent perspectives are offered by Rivera-Mamani et al. [5] in their systematic review of e-learning as an educational strategy in universities. Analyzing over 50 studies, they conclude that e-learning significantly enhances student engagement and learning outcomes, particularly post-pandemic, by providing anytime-anywhere access and reducing educational costs.

Finally, Peraza et al. [6] propose a didactic innovation using new technologies in biomedical basic sciences education, focusing on e-learning tools for interactive teaching. They describe a model integrating videos, simulations, and online assessments to make complex subjects more accessible, demonstrating improved student retention through technology-enhanced pedagogy.

5. Methodology

5.1. Requirement Identification

5.1.1. Study of Existing System

The current system limits students to lecture-based resources, affecting performance. Issues include:

- Submissions of hard copy or email assignments.

- Physical attendance in the classroom is required.

- Lack of monitoring of resource sharing and discussions.

SkillUp will centralize course syllabuses, improve communication between students, lecturers, and administration, and provide access anytime, anywhere. The results include uploads of lecture resources, student downloads and submissions, and efficient course management.

5.1.2. Requirement Collection

Requirements were gathered by analyzing the existing system and stakeholder inputs.

5.1.2.1. Functional Requirements

- CRUD operations for users, courses, materials, assignments, and quizzes.

- Student course enrollment, resource access, assignment submission, and quiz attempts.

- Lecturer course creation, resource uploads, assignment posting, and quiz conduction.

- Centralized resource repository.

- Secure, role-based login for students, lecturers, and administrators.

5.1.2.2. Non-Functional Requirements

- Intuitive, user-friendly interface.

- High availability and accessibility.

- Fast, efficient performance.

- Secure data protection.

5.1.2.3. System Requirements

Minimum hardware:

- Processor: Intel i3

- RAM: 4 GB

- Storage: 500 GB HDD/SSD

- Network: 1 Mbps Internet

Minimum software:

- Frontend: Chrome or Firefox

- Backend: Django (Python 3.8+), PHP 7+, or Node.js 14+

- Database: MySQL 5.7+

- IDE: VS Code

- Tools: XAMPP, Postman

5.2. Feasibility Study

Assessing project realism and viability.

5.2.1. Technical Feasibility

- Compatible with modern browsers.

- Utilizes React.js, Node.js, and MySQL.

- Team possesses adequate expertise.

5.2.2. Financial Feasibility

- Uses open-source technologies, minimizing costs.

- No new hardware needed.

- Reduces printing and physical material expenses.

5.2.3. Operational Feasibility

- User-friendly design.

- Improved student-lecturer interaction.

- Access anytime, anywhere.

5.3. High-Level Design of System

Providing an overview of project structure, component interactions, data flow, and user interaction.

5.3.1. System Flowchart
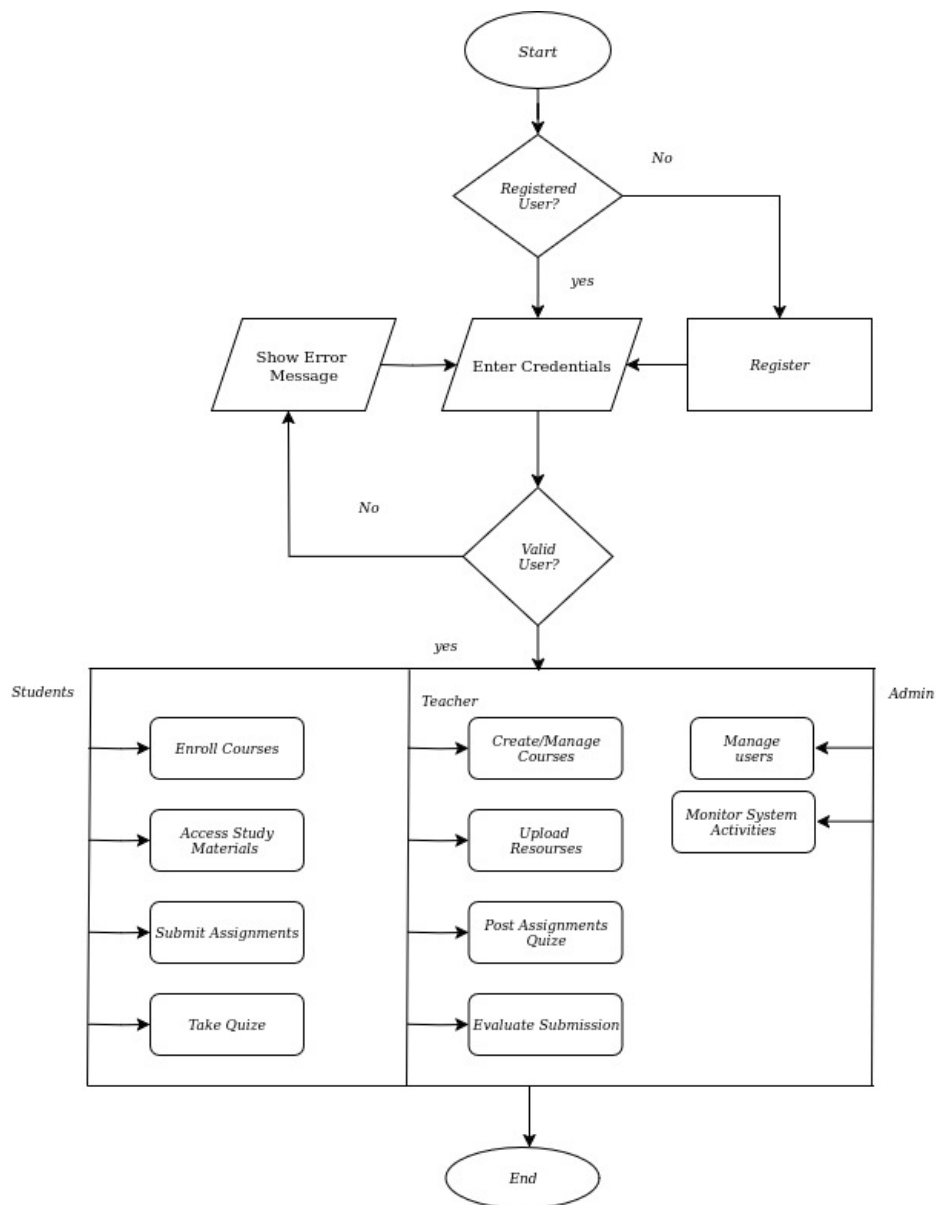
Users log in/register and are directed by roles:

Figure 0.1. System Flowchart

- **Student**: Enroll in courses, access materials, submit assignments, and take quizzes.

- **Lecturer**: Manages courses, uploads resources, and evaluates assignments.

- **Admin**: Oversees users, ensures security, and monitors activities.

5.3.2. Methodology used in this system

The methodology or software development model used in this project is the waterfall model. It is simple and used with clear and well-defined requirements.
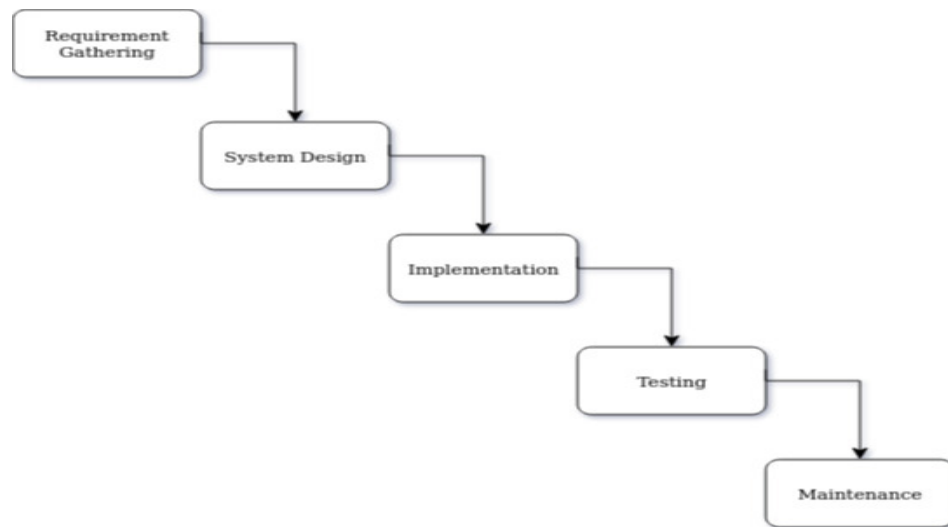

Figure 0.2. Fig 5.2: Waterfall model

- **Requirements and Planning**: This phase involves identifying and describing the project's requirements, risks, assumptions, dependencies, quality metrics, costs, and timeline.

- **Design**: The design phase solidifies and documents all your decisions. The best way to do so is to note all the actions you will take to deliver the project scope to execute them.

- **Implementation**: The implementation phase executes your project plan and design to produce the desired product.

- Verification **Verification/Testing**: Testing verifies that the product developed in the implementation phase meets all requirements of the project. The testing phase uses various quality metrics and customer satisfaction to measure the project's success.

- **Maintenance**: This phase involves making minor modifications to improve the product developed during implementation and performing other routine maintenance tasks. It is also a phase for identifying any errors that you might have missed during the testing phase.

6. Gantt Chart

A Gantt chart is a visual project management tool that illustrates the timeline, tasks, and milestones of a project, helping to plan and track progress effectively. For the development of the "SkillUp" E-Learning platform, the Gantt chart outlines the key phases, their durations, and dependencies to ensure timely completion. The chart includes the following major tasks:
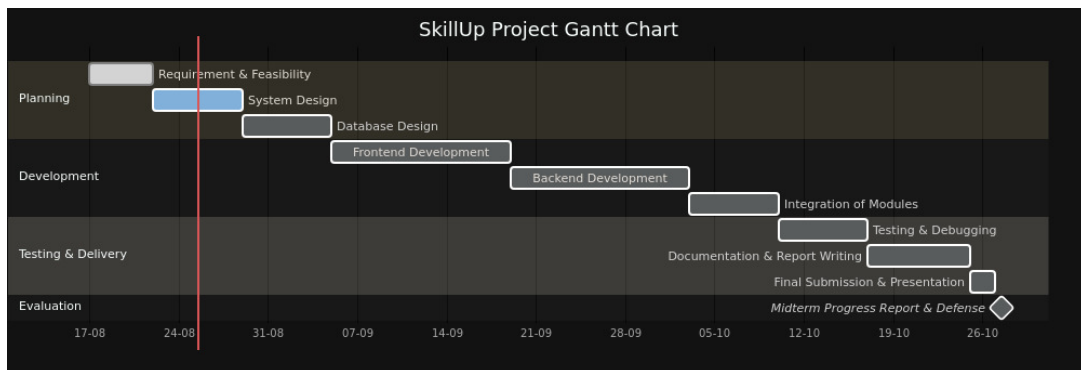

Figure 0.3. Gantt Chart

- **Requirements and Planning**: This phase involves gathering requirements, defining the scope of the projectthe project, and creating a detailed plan. Duration: 11 August 2025 - 20 August 2025 (1.5 weeks).

- **Design**: This phase focuses on designing the system architecture, user interface, and database structure. Duration: August 21, 2025 - September 5, 2025 (2.25 weeks).

- **Implementation**: This phase includes the development of frontend and backend components and integration. Duration: September 6, 2025 - October 6, 2025 (4.5 weeks).

- **Verification/Testing**: This phase involves testing the platform for functionality, performance, and security, followed by bug fixes. Duration: October 7, 2025 - October 22, 2025 (2.25 weeks).

- **Maintenance and Deployment**: This phase covers the final deployment of SkillUp, initial user training, and ongoing maintenance planning. Duration: October 23, 2025 - November 3, 2025 (1.5 weeks).

The Gantt chart visually represents these tasks with horizontal bars indicating start and end dates, allowing the project team to monitor progress and adjust schedules as needed.

Chapter 1

Expected Outcomes

SkillUp will merge traditional and digital education, boosting efficiency. The following outcomes are anticipated:

1. **Centralized Learning Resource**

    - Unified storage for course materials, assignments, and quizzes.

    - Eliminates dependency on physical documents.

2. **Improved Communication**

    - Real-time discussion forums and instant feedback.

3. **Efficient Course Management**

    - Simplified course creation and student-progress tracking.

4. **Time and Cost Efficiency**

    - Anytime-anywhere learning; reduced need for printed resources.

5. **Enhanced Monitoring**

    - Administrative oversight of user activity and performance.

Chapter 2

Implementation & Screenshots

The platform has been developed using **Express.js** for the backend, **React.js** for the frontend, and **MySQL** for persistent storage. Key user-interface screens are shown below.
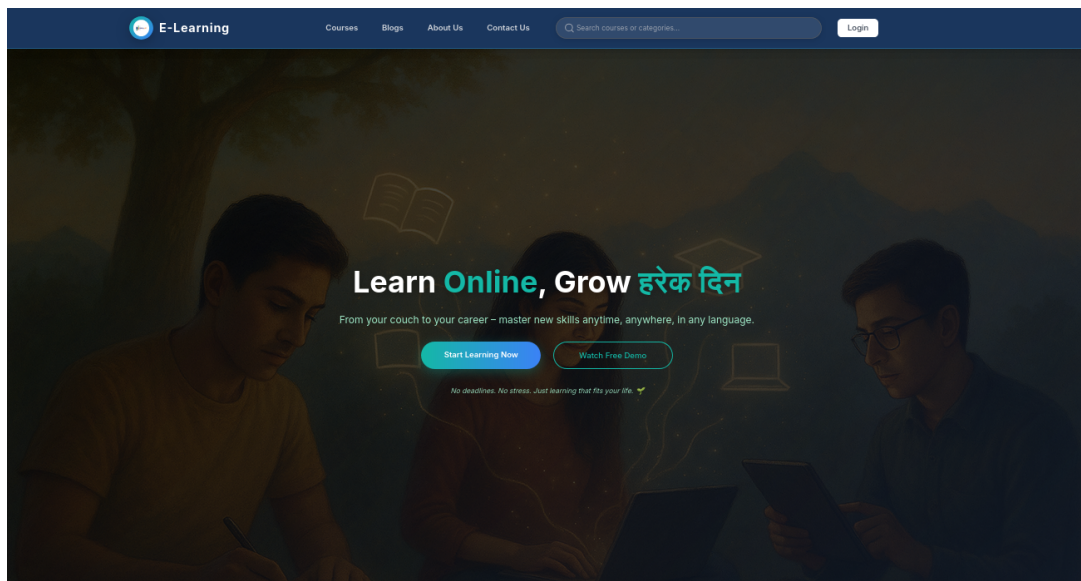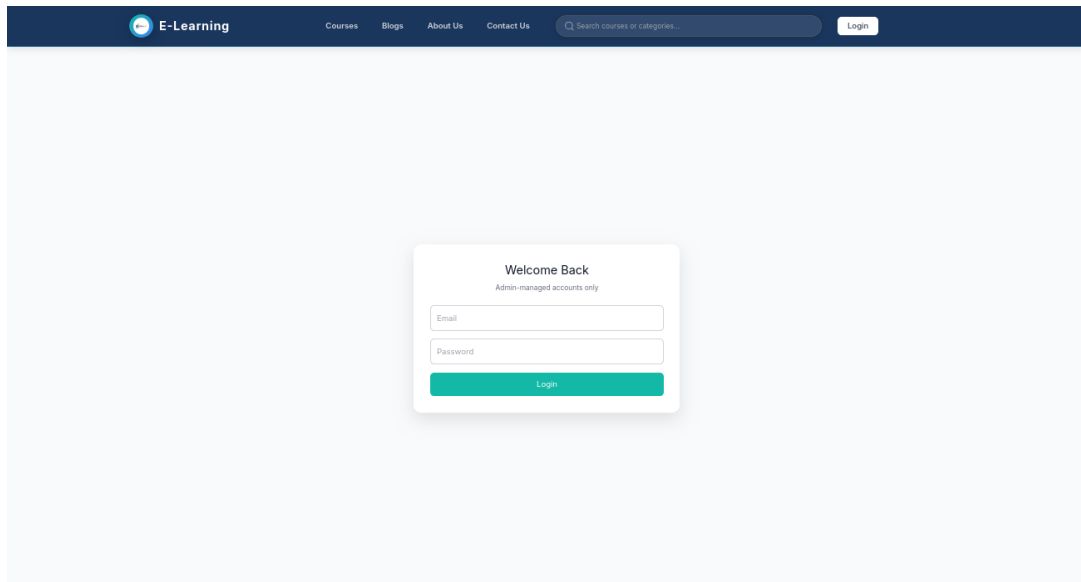

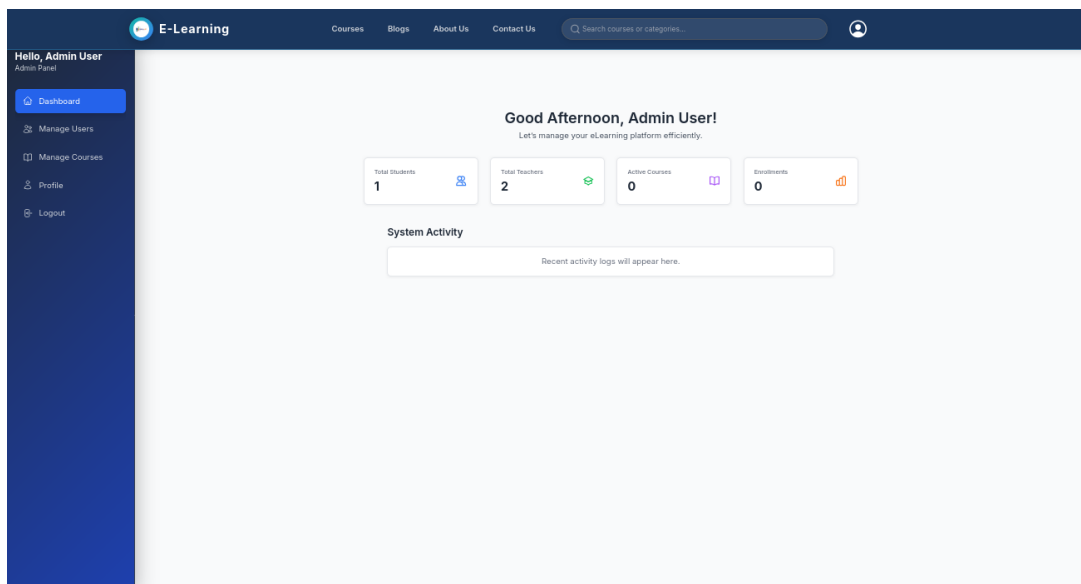**Figure 2.1. Landing Page**

Figure 2.2. Login Page
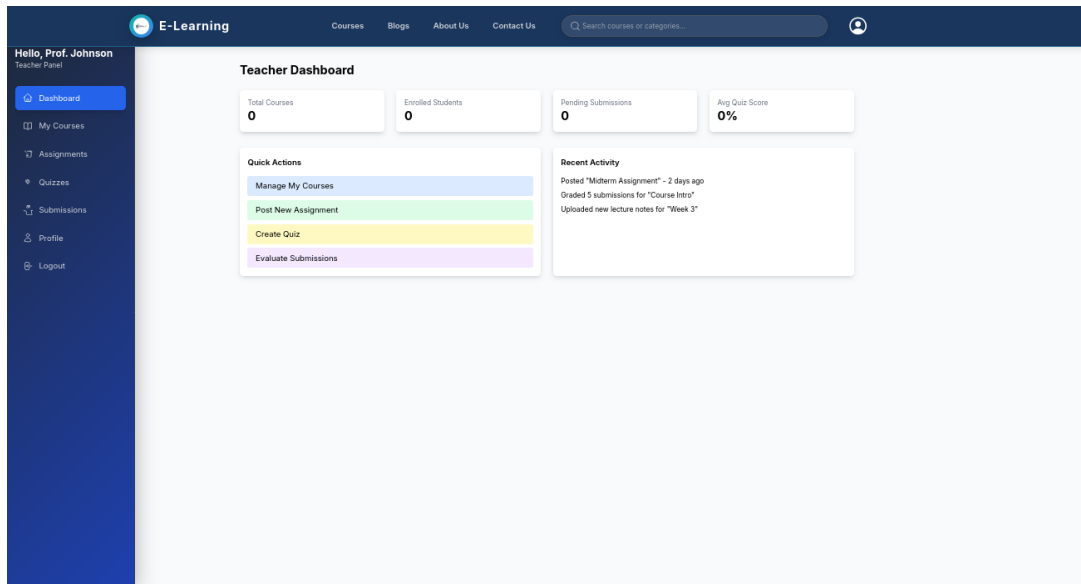

Figure 2.3. Admin Dashboard

Figure 2.4. Teacher Dashboard

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