© Volume 2, Issue 10, October 2026 | JATIR
e-ISSN: 2839-5786, p-ISSN: 3139-8464

Smartcampus Ai-An Ai Powered College System

[1]Shivani shitole, [2]Bhakti Kulkarni, [3]Suraj Darade, [4]Yash Patil
[1]*Assistant Professor, Parvatibai Genba Moze College, Pune, India*
[2,3,4]*Student Information Technology Parvatibai Genba Moze College, Pune, India*

***Abstract*—SmartCampus AI is a web-based college learning and academic management platform that integrates attendance, study materials, assignments, and artificial intelligence assisted learning into one system. It provides separate modules for administrators, teachers, and students. The system uses artificial intelligence-based face recognition to identify students from classroom photographs and automatically record attendance. Teachers can upload learning materials, create assignments, review submissions, and provide feedback, while students can access resources, submit assignments, and track their academic activities. The AI Study Assistant helps students generate summaries, ask questions, create flashcards, and practice multiple choice questions. The platform also provides dashboards and reports for monitoring academic activities. Overall, SmartCampus AI reduces manual work, improves access to learning resources, and provides an organized and interactive academic environment.**

***Index Terms*—SmartCampus AI, academic management, artificial intelligence, face recognition, attendance management, study assistant, assignments, web-based learning.**

I. INTRODUCTION

Technology has become an essential part of modern education, but many colleges still manage academic activities using separate or manual methods. Attendance, study materials, assignments, and student records are often maintained through different systems or traditional processes. This can increase teachers' workload and make academic management time-consuming and less efficient. It can also make it difficult for students to access learning resources in an organized manner. SmartCampus AI is a web-based college learning and academic management platform designed to integrate these activities into a single system. The platform provides separate access and functionalities for Admin, Teachers, and Students based on their respective roles. Administrators can manage users, subjects, courses, and other academic information through the system. Teachers can manage attendance, upload study materials, create assignments, and provide feedback to students. Students can access study materials, check attendance, submit assignments,

and use various learning features. The system uses AI-based face recognition to assist teachers in recording attendance from classroom photographs. This feature helps reduce the time and manual effort required for traditional attendance processes. SmartCampus AI also includes an AI Study Assistant to support students in understanding and revising their study materials. Students can generate summaries, ask questions, create flashcards, and practice MCQs using the uploaded learning content. The platform provides a centralized location for accessing important academic resources and activities. It can also maintain attendance and assignment records in an organized manner. By combining academic management with artificial intelligence, the system aims to improve efficiency and accessibility. The proposed platform reduces repetitive manual work and provides a more structured academic workflow. It also encourages students to use interactive and technology-based learning methods. SmartCampus AI combines web development, database management, artificial intelligence, and face recognition technologies. Overall, the system aims to provide an organized, efficient, and interactive digital learning environment for modern college education.

II. PROBLEM STATEMENT

Many colleges manage attendance, study materials, and assignments through separate or manual methods, making academic management time-consuming and less organized. Manual attendance can also lead to errors and proxy attendance. Students may face difficulty in accessing and understanding study materials efficiently. The project aims to develop a centralized web-based platform that uses AI-based face recognition for attendance and an AI-powered study assistant to provide easier access to academic resources and learning support.

III. MOTIVATION

The motivation behind SmartCampus AI is to simplify common academic activities that are often managed manually or through multiple platforms. Manual attendance requires time and effort from teachers, while students may find it difficult to organize and understand study materials. The project aims to use AI-based face recognition and an AI-powered study assistant to reduce these difficulties and provide a more efficient, centralized, and interactive academic platform.

IV. AIM & OBJECTIVES

Aim: - To develop a centralized web-based college platform that simplifies academic management through AI-based face recognition attendance and AI-powered study assistance.

Objective: -

1. To develop a centralized platform for Admin, Teachers, and Students to manage academic activities.

2. To implement AI-based face recognition for attendance using classroom photographs.
3. To provide a platform for study-material and assignment management.
4. To develop an AI Study Assistant for summaries, question answering, flashcards, and MCQs based on uploaded materials.
5. To reduce manual effort and improve the accessibility and organization of academic resources.
6. To generate attendance and academic reports through user-friendly dashboards.

V. SCOPE OF THE PROJECT

The scope of SmartCampus AI is to develop a centralized web-based platform for managing academic activities and supporting student learning. The system will cover:

1. User Management – Role-based access for Admin, Teachers, and Students.
2. AI Attendance – Face recognition from classroom photographs to assist in recording attendance.
3. Study Material Management – Upload, access, search, and bookmark notes, PPTs, videos, and reference links.
4. AI Study Assistant – Generate summaries, answer questions, create flashcards, and generate MCQs from uploaded study materials.
5. Assignment Management – Assignment creation, submission, deadlines, feedback, and tracking.
6. Dashboards & Reports – Attendance, assignments, and academic information for different users.

VI. EXISTING SYSTEM & ITS LIMITATION

Existing System:-In many colleges, academic activities such as attendance, study-material sharing, assignments, and student communication are managed using separate tools or manual methods. Attendance may be recorded manually, while notes and assignments are shared through different platforms.

Limitations

- Manual attendance is time-consuming.
- Attendance records may contain errors or proxy attendance.
- Study materials are often scattered across different platforms.
- Finding specific information from lengthy notes can be difficult and time-consuming.
- Assignment submission and tracking may be less organized.
- There is no integrated AI-based learning assistance in the existing approach

VII. PROPOSED SYSTEM

SmartCampus AI is a centralized web-based platform that integrates attendance, study materials, assignments, and AI-powered learning assistance for Admin, Teachers, and Students. The system uses AI-based face recognition to identify students from classroom photographs uploaded by teachers and assist in generating attendance records. Teachers can upload and organize study materials and manage assignments, while students can access resources, submit assignments, and view their attendance. The AI Study Assistant processes uploaded study materials and helps students generate summaries, answer questions, create flashcards, and practice MCQs based on the provided content. The system also provides dashboards and reports to simplify academic monitoring and management.

VIII. PROPOSED METHODOLOGY

The proposed system will be developed using a modular approach consisting of the following steps:
Requirement Analysis – Identify the requirements of Admin, Teachers, and Students.
System Design – Design the architecture, database, and modules.
Development – Develop frontend, backend, and database components.
AI Attendance – Use face recognition on classroom photographs to generate attendance.
AI Study Assistant – Process uploaded study materials to provide summaries, question answering, flashcards, and MCQs.
Testing and Deployment – Integrate, test, and deploy the system.

IX. SYSTEM ARCHITECTURE

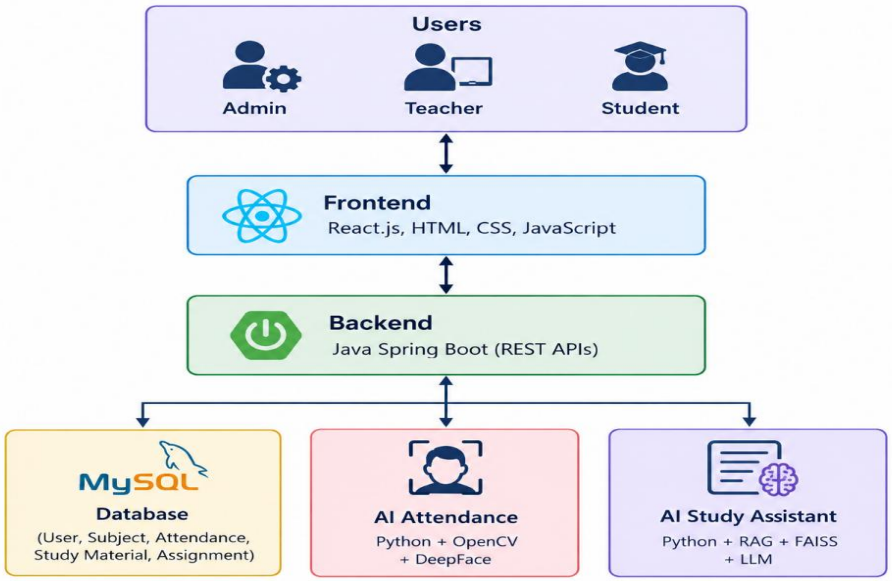

Figure 1: System Architecture of SmartCampus AI

X. MODULE DESCRIPTION

Module	Responsibility
Authentication and User Management	Provides secure login for Admin, Teacher, and Student with role-based access and user management.
AI-Based Face Recognition Attendance	Recognizes students from classroom photographs and automatically records attendance. Teachers can view and manage attendance reports.
Study Material Management	Allows teachers to upload and organize notes, PPTs, videos, and links. Students can access, search, download, and bookmark materials.
AI Study Assistant	Uses uploaded study materials to provide summaries, question answering, MCQs, flashcards, and important questions.
Assignment Management	Enables teachers to create assignments and manage submissions, while students can submit assignments and view feedback.
Dashboard and Reports	Provides separate dashboards showing attendance, assignments, study materials, submissions, and other academic information.

XI. HARDWARE & SOFTWARE

Hardware:-

- Processor: Intel Core i5 or equivalent.
- RAM: Minimum 8 GB.
- Storage: Minimum 256 GB SSD.
- Camera: Laptop/mobile camera for classroom image capture.
- Internet: Required for AI/API-based features.
- Display: Standard monitor/laptop display.

Software:-

- Operating System: Windows 10/11.
- Frontend: HTML, CSS, JavaScript.
- Backend: Java, Spring Boot.
- Database: MySQL.
- AI/Face Recognition: Python, OpenCV.
- AI Study Assistant: Python, NLP/LLM API.
- Development Tools: VS Code.
- API Testing: Postman.
- Version Control: Git, GitHub.

XII. DATABASE/UML DESIGN

- The system will use MySQL to store user, student, teacher, subject, attendance, study material, assignment, and submission details. UML diagrams such as Use Case Diagram, Class Diagram, and Activity Diagram will represent the interaction and workflow of the system.
- Main Database Entities:
- User, Student, Teacher, Department, Subject, Attendance, Study, Material, Assignment, Submission, AI Query/Response.

XIII. INNOVATION/NOVELTY

- AI-based face recognition attendance using classroom photographs instead of manual attendance.
- AI Study Assistant that provides summaries, Q&A, MCQs, and flashcards based on uploaded study materials.
- Unified platform integrating attendance, study materials, assignments, and academic dashboards in one system.
- Reduces manual work and provides students with personalized, easily accessible learning support.

XIV. EXPECTED OUTCOMES

- Automated and efficient face recognition-based attendance system.
- Centralized access to study materials and assignments.
- AI-based summarization, Q&A, MCQs, and flashcards for better learning.
- Easy monitoring of attendance, assignments, and academic activities through dashboards.
- Reduced manual work for teachers and improved accessibility for students.

XV. APPLICATIONS

- Educational Institutions – For managing attendance, study materials, and assignments.
- Colleges and Universities – For automated face recognition-based attendance and academic monitoring.
- Teachers – For managing learning resources, assignments, and student attendance.
- Students – For accessing study materials and using AI-powered learning assistance.
- Academic Administration – For centralized monitoring and generation of academic reports.

XVI. ADVANTAGES & LIMITATIONS

Advantages: -

- Automates attendance using AI-based face recognition.
- Provides study materials and assignments on a single platform.
- AI assistant helps students with summaries, Q&A, MCQs, and flashcards.
- Reduces manual work for teachers.
- Provides easy access to attendance and academic reports.

Limitations:

- Face recognition accuracy may be affected by poor lighting, image quality, or face obstruction.
- Requires a sufficient student face database for recognition.
- AI features may require internet connectivity and API services.
- Initial setup and registration of student data require time.
- Large classroom images may require higher processing resources.

XVII. FUTURE SCOPE

- Integration with mobile applications for students and teachers.
- Real-time attendance using live camera/video streams.
- Improved face recognition accuracy using advanced AI models.
- Integration with college ERP and existing academic systems.
- Personalized AI learning recommendations based on student performance.
- Cloud deployment for scalable and remote access.

XVIII. LITERATURE SURVEY

1. Face Recognition: Used for automated attendance and reducing manual work.
2. AI in Education: Used for summarization, question answering, and personalized learning.
3. Learning Management Systems: Provide study materials, assignments, and academic tracking.
4. Research Gap: These features are often provided through separate systems.
5. Proposed System: Integrates attendance, learning resources, assignments, and AI assistance into one platform.

REFERENCE

[1]. "Face Recognition Based Smart Attendance System," IEEE International Conference on Computer, Communication and Informatics, 2020.

[2]. "Attendance Management System Based on Face Recognition Using Haar-Cascade," IEEE International Conference on Advance Computing and Innovative Technologies in Engineering, 2022.

[3]. Sanchez, L., Penarreta, J., and Soria Poma, X., "Learning Management Systems for Higher Education: A Brief Comparison," Discover Education, 2024.
[4]. "Automatic Question-Answer Pairs Generation Using Pre-trained Large Language Models in Higher Education," Computers and Education: Artificial Intelligence, 2024.
[5]. AlAwwad, H. A. et al., "Enhancing Textual Textbook Question Answering with Large Language Models and Retrieval Augmented Generation," Pattern Recognition, 2025.