

## WissenHaus Learning Management System

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### ABSTRACT

This project presents an intelligent e-learning application designed to enhance the teaching and learning experience through automation and artificial intelligence. The platform enables faculty members to upload course topics and video lectures, which are systematically organized for easy access by students. Learners engage with the content by watching videos and completing quizzes associated with each topic.

To reduce the workload on faculty, the system automatically generates quizzes using AI based on the uploaded content. It continuously evaluates student performance and promotes effective learning by allowing progression to the next topic only when a student achieves a score of at least 85%. If a student is unable to meet this threshold after five attempts, the system automatically sends an email notification to the instructor, indicating that the student may require additional support in understanding the topic.

Additionally, the platform incorporates a feedback mechanism that allows students to share their opinions on lectures. This feedback is automatically delivered to the instructor via email, supporting continuous improvement in teaching quality. A distinctive feature of the system is the integration of a drowsiness detection module. During lectures, the system monitors student alertness using real-time detection techniques. If signs of drowsiness—such as prolonged eye closure—are identified, a buzzer alert is triggered to regain the student's attention.

**Key Words:** Learning Management System (LMS), Artificial Intelligence (AI), Video Content Analysis, Interactive Learning, Web-Based Application

### 1. INTRODUCTION

With the rapid growth of digital education, e-learning platforms have become essential tools in modern classrooms. Systems such as Google Classroom,

Moodle, and Coursera provide content delivery, assessments, and communication features. However, these platforms primarily focus on content distribution and lack deep integration of automated assessment generation and real-time engagement monitoring. Recent advancements in Artificial Intelligence and Machine Learning have enabled intelligent systems capable of generating questions and analyzing learner behavior. WissenHaus builds upon these advancements to create a more interactive and adaptive learning environment.

This process enhances the understanding of the video's key points, making it a valuable tool for researchers, educators, content creators, and anyone seeking in-depth comprehension of video materials. It offers role-based access to administrators, teachers, and students, ensuring data security and controlled information flow. It is a web-based application designed to efficiently manage and organize institutional operations such as student information, staff records, course management, attendance, and performance tracking.

The system replaces traditional manual processes with an automated and centralized platform, reducing paperwork and human errors. It provides role-based access for administrators, faculty, and students, ensuring secure and efficient data handling. By integrating database management and real-time reporting features, the system improves operational efficiency, transparency, and decision-making within the institution.

Overall, the Wissen Haus Management System offers a scalable and user-friendly solution for effective academic and administrative management.

### 2. LITERATURE SURVEY

A Learning Management System (LMS) is a web-based or software application used to administer, document, track, and deliver educational content and learning activities. LMS platforms help in managing training programs, educational materials, and student learning processes efficiently[1]. Initially, LMS systems were simple content repositories, but they have evolved into advanced digital learning ecosystems. Modern LMS platforms integrate: Multimedia content (videos, notes), Assessment tools (quizzes, exams), Communication features (chat, forums), Analytics dashboards [2]. WissenHaus LMS provides an intelligent and automated learning environment for both faculty and students[3]. Faculty members can upload course materials such as videos and notes, making content easily accessible[4]. Students can access learning materials anytime and anywhere, ensuring flexibility and convenience[5]. A key advancement in LMS is the integration of Artificial Intelligence (AI). AI in LMS enables: Automated quiz generation, Personalized learning paths, Continuous performance evaluation[6]. AI reduces faculty workload and improves overall student engagement and learning efficiency. LMS platforms support both: Synchronous learning (live classes) & Asynchronous learning (self-paced learning) [7]. LMS systems provide real-time analytics and reporting. These analytics help educators: Track student progress, The system enhances the overall teaching-learning experience.[8]. It also promotes digital transformation in education and WissenHaus LMS builds upon modern e-learning technologies by integrating AI and automation for better outcomes[9]. The system introduces automatic MCQ generation from video content. Students actively participate while watching videos, improving understanding[10]. WissenHaus LMS integrates: Content delivery, Automated assessment Engagement monitoring, The system provides real-time feedback to students. The platform ensures a smart and interactive learning environment[11]. Overall, WissenHaus is an intelligent e-learning system combining AI, automation, and user engagement. WissenHaus LMS transforms traditional education into interactive digital learning[12]. LMS platforms have become essential tools in modern education systems worldwide[13]. WissenHaus LMS is a smart, scalable, and efficient system[14]. It integrates automation, content management, and learner assessment[15].

### 3. PROPOSED SYSTEM

The Wissen Haus Management System aims to bridge the gap between passive video content and interactive learning. By automatically generating MCQs at intervals provided by teacher on video content, the project empowers users to engage more actively with video materials. This enhances knowledge retention and enables users to explore video content more effectively.

### Division of Modules:

1. Teacher Module
2. Video Management Module
3. Question / Answer Management
4. Student Module
5. Mood Module

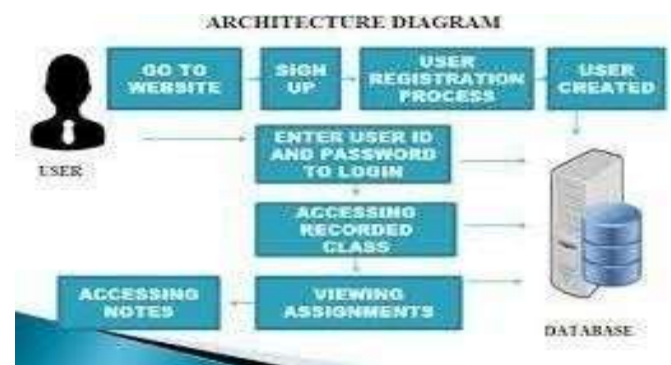


Figure 1. Proposed system architecture of WissenHaus Learning Management System

### 4. RESULTS DESCRIPTION

The Figure 3 The Result page of the WissenHaus system displays the final performance outcome of the student after completing the quiz. It provides a clear summary of the student's score along with an evaluation of their understanding of the topic. The system calculates the marks automatically based on

the number of correct answers and presents them in an easy-to-understand format. This result helps students identify their strengths and weaknesses in specific subjects.

Additionally, it ensures transparency in assessment and motivates learners to improve their performance. The result section is integrated with the progress tracking system, allowing both students and teachers to monitor academic growth effectively.

Overall, the Result page plays a crucial role in providing immediate

generating relevant questions and answers, which helps improve user engagement and knowledge retention..

One of the major strengths of the system lies in its ability to provide immediate feedback through quizzes and result analysis, enabling learners to understand their performance in real time.

The role-based access control for administrators, teachers, and students ensures proper management and secure handling of educational content. From a Figure 3 Detailed Review technical perspective, the

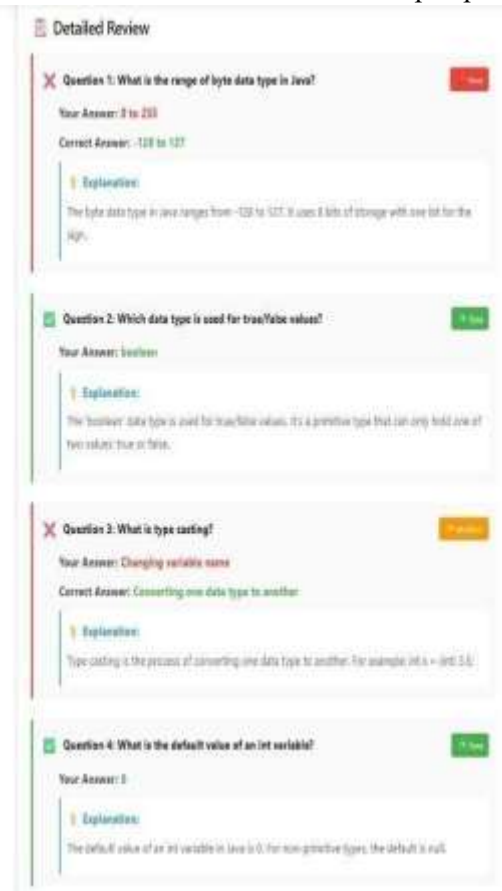


Figure 2. Web interface for proposed WissenHaus Learning Management System

system demonstrates efficient implementation of AI techniques such as Natural Language Processing.

Figure3 Detailed Review, The WissenHaus Learning Management System presents a well- structured and innovative approach to enhancing digital learning through the integration of Artificial Intelligence. The system effectively transforms traditional videobased content into an interactive learning experience by

Figure3: The Detailed Review

content understanding and question generation. The architecture is designed in a modular way, allowing scalability and flexibility for future enhancements. The inclusion of client-side processing and secure data

handling mechanisms improves reliability and user trust. Furthermore, the user interface is simple and intuitive, making it accessible even for users with minimal technical knowledge. However, there are certain limitations observed in the system. The accuracy of automatically generated questions depends heavily on the quality of input video content and underlying AI models. In some cases, the generated questions may lack depth or contextual understanding. Additionally, the system may require high computational resources for processing large video files, which can affect performance. There is also scope for improvement in personalization features, such as adaptive learning paths based on individual student performance.

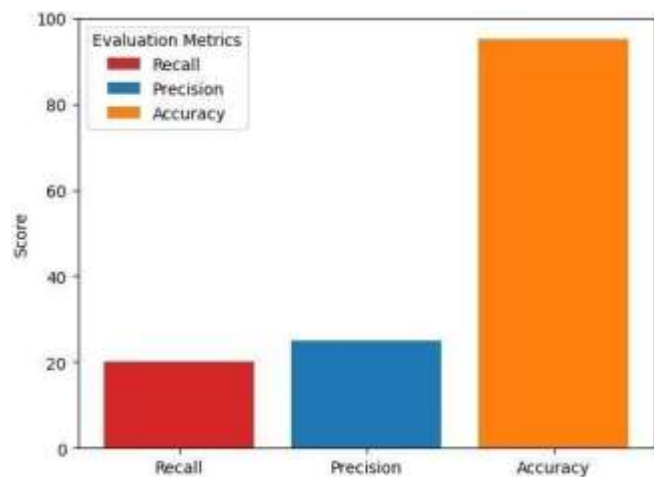


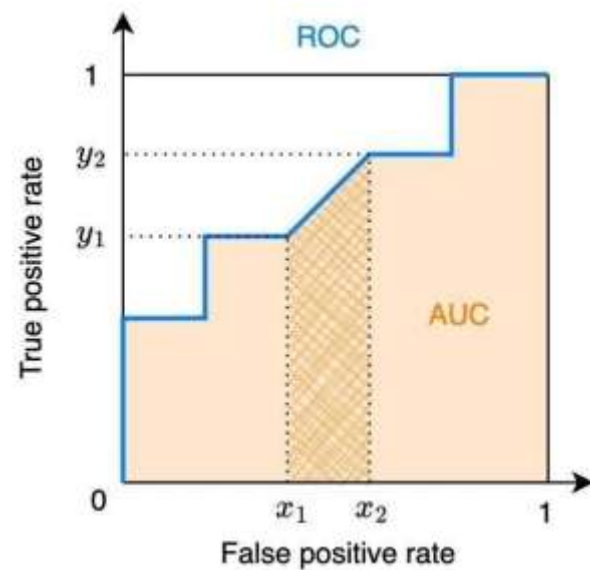
Figure 4 Bar Chart

**X-axis:** Models / Modules (e.g., Quiz Analysis, Video Understanding, NLP Module)

**Y-axis:** Accuracy (%)

Figure 5. ROC curve

The ROC curve is a graphical representation used to evaluate the performance of a classification model. It plots the true positive rate against the false positive rate. A curve closer to the top-left corner indicates better performance. The area under the curve (AUC) represents the overall accuracy of the system.



## 5.CONCLUSION

The proposed AI-based student learning system offers an intelligent and interactive approach to modern education by integrating automated content delivery, assessment, and monitoring features into a single platform. By allowing students to access recorded lectures posted by teachers, the system ensures flexible and self-paced learning, which is especially beneficial for diverse learning environments.

The inclusion of AI-generated quizzes after each topic strengthens concept understanding and ensures continuous evaluation. The condition of achieving a minimum of 85% to progress further motivates students to focus on mastering each topic before moving ahead, thereby improving overall academic performance and knowledge retention.

Additionally, the feedback mechanism creates a direct communication channel between students and teachers, enabling continuous improvement in teaching quality.

The system also incorporates an innovative drowsiness detection feature, which actively monitors student attentiveness during lectures. If a student shows signs of

drowsiness, such as closing their eyes, the buzzer alert helps them regain focus, enhancing learning efficiency.

Overall, this project demonstrates how artificial intelligence can be effectively utilized to create a smart, adaptive, and student-centered learning environment. It not only improves engagement and performance but also supports teachers in identifying student difficulties, making the education process more efficient, personalized, and impactful.

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