DONLEARN:Transforming Learning with AI-Driven Smart LMS- Survey

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Abstract. To revolutionize education by integrating artificial intelligence (AI) into Learning Management Systems (LMS).As of 2025, approximately 47% of Learning Management Systems (LMSs) in educational settings have integrated artificial intelligence (AI) tools and capabilities.By implementing an AI-driven chatbot, the project provides real-time, personalized support to students, enhancing their learning experience and engagement. Additionally, the system automates the creation of educational content, such as quizzes and assignments,significantly reducing the workload for educators. The project also emphasizes ethical considerations, ensuring fairness and inclusivity in AI applications.

Keywords: Artificial Intelligence,Learning Management Systems, Personalized Learning, Educational Technology,Ethical A I Integration .

1 Introduction

Education is evolving fast, and Artificial Intelligence (AI)is playing a big part in that change. From personalized learning to smarter teaching tools, AI is helping make education more engaging and accessible for everyone.This project explores how AI is improving the way students learn and teachers teach, while also looking at important issues like data privacy and fairness. The goal is to show how we can use AI to support education—without losing the human touch that makes learning meaningful.

Learn StreamAI, brings an AI chatbot into Moodle to help students get instant support while they learn. It also uses AI in Code Runner to give smart, personalized feedback during stats courses—making learning more tailored and interactive [1,9].

An MCQ creation tool saves teachers time while improving quizzes. The AEG system helps grade essays fairly and accurately. A note-making tool boosts understanding and memory, and interactive storytelling keeps students engaged with personalized stories[2,10].

The study used a mixed approach—both quantitative(numbers/data) and qualitative (opinions/feedback)—with an experimental design to test how an AI assistant affects student success [6,14].

By examining both the potential and pitfalls of AI integration,helping educators make smarter choices.The pivotal aim of this study is to examine the current role of AI in education through a critical review and conceptual methodological approach [8,15].

2 Literature Review

Lars Mehnen et al. 2024 study, "Supporting Academic Teaching by Integrating AI in PowerShell + MS," introduces a tool designed to help both teachers and students use AI in platforms like Moodle and Excel. The tool automates tasks such as creating slides, quizzes, and feedback, which makes the teaching process more

efficient[1].This study explores how AI-powered adaptive content delivery can enhance engagement and personalize learning experiences in flipped classrooms, demonstrating promising improvements in student outcome[9]. Aathif Anwar et al 2023 study, "Empowering Secondary Education Through AISupported E-Learning," presents a webapp designed for high school students that uses AI to assist with tasks like quizzes, notes, grading, and storytelling. The app leverages powerful AI models, including T5, GPT-2, and tools from OpenAI, to provide support in various educational activities. It performs well, with tasks like quizzes showing a high accuracy rate of 86.5%[2].The paper presents a hybrid method for automatic extractive summarization, aiming to improve the efficiency and accuracy of summarizing large text data for sustainable ICT solutions.[10] Orlando-Ventayen et al. (PSU, Philippines)The study by them employed a qualitative methodology, including interviews,focus groups, and document analysis, to explore AI awareness and trends in education. The participants consisted of 22 Ed.Dstudents, all of whom were teachers, providing valuable insights from an educator's perspective. The research utilized Scopus analysis and generative AI tools like ChatGPT, revealing that 80% of participants were aware of AI, and 1,194 AI-related education articles were identified in Scopus. The study's strengths lie in its strong bibliometric foundation and its focus on educator perceptions, which highlight emerging trends in AI adoption[3].This paper introduces the key technologies behind AI and big data in e-learning, emphasizing their potential to personalize and improve education delivery[11].

Chen et al. (National Central University, Taiwan) conducted an experimental study comparing a control group with an experimental group to evaluate the impact of AI tools in hospitality education.The participants included 38 students in the experimental group and 35 in the control group, with a focus on ChatGPT, prompt engineering, and Microsoft Azure.The results demonstrated significant improvements in the experimental group, with post-test scores averaging 89.03 compared to 83.70 in the control group ($p=0.001$).Additionally, the study noted higher grit (4.08 vs. 3.68) and mindset scores (4.10 vs. 3.40) in the experimental group[4].A systematic review examining chatbot use in education, showcasing their benefits in tutoring, engagement, and administrative support[12].

V.Bhatt et al. (VIT Bhopal University, India) investigated the application of AI in education through case studies and pilot deployments, analyzing tools like DreamBox, Knewton, Bayesian networks, and recommender systems. The study involved mixed participants, including students and teachers, in pilot classes. Key findings included improved math scores,enhanced student engagement, and the ability to detect learning gaps. The research highlighted the benefits of AI, such as customized content, teacher analytics, and inclusive design.However, challenges such as data privacy concerns, the need for teacher training, and issues related to digital access were identified as significant barriers to widespread AI adoption in educational settings [5].This study discusses emotionally aware tutoring systems that can detect and adapt to students' emotional states to improve learning outcomes[13]. Llanos et al., 2024 Enhancing Student Success through AI Integration .This study employed a mixed-methods approach with a controlled experimental design to assess the effectiveness of an AI-powered virtual assistant (AI Tutor) across eight introductory university courses. The AI Tutor was built using a RetrievalAugmented Generation (RAG) framework, integrating GPT-4-o3, GPT-4-o-mini, OpenAI ADA embeddings, and Pinecone vector databases, deployed through the Blackboard LMS. Results demonstrated a notable improvement in student outcomes, including increased engagement, higher grade averages, better assignment submission punctuality, and reduced course withdrawal rates.While the tool achieved high satisfaction scores and significantly enhanced student support, limitations were noted,including a 7% escalation rate to human assistants and the tool's confinement to a specific institutional context. Future enhancements suggested include extending the system to other institutions and refining it with emotionally intelligent response capabilities [6].This work introduces Retrieval-Augmented Generation (RAG), a method that combines retrieval and generation techniques to significantly boost performance on knowledge-intensive NLP tasks[14].

Mohamed Oubibi et al. Designing and Developing Online Learning Activities for Adult Learners (2024):This paper focused on creating online learning experiences tailored for adult learners using an Open University platform, likely involving tools such as Moodle and interactive e-learning modules. The methodology followed a design-based research approach that emphasized flexibility, learner autonomy, and accessibility[7].

P A Christou Implications of Artificial Intelligence in Education: A Critical Review (Christou,2024):conducted a comprehensive critical review and conceptual analysis to examine AI's impact on education. Drawing data

from ERICand Scopus databases and utilizing AI-based tools like InfraNodus for network analysis, the study identified five major themes: pedagogical transformation, benefits and challenges of AI, ethical concerns, policy development, and the need for ongoing professional development[8].The authors highlight the growing concern of online addictions among students and question the role of technology educators in addressing this emerging issue[15].

Paper	Focus Area	Methodology	AI Tools Used	Outcomes	Limitations
[1] Mehnen et al.	Teaching Support	Tool development	Moodle, Excel, ChatGPT	Time-saving, multilingual support	Odd content formatting
[2] Anwar et al.	Secondary Ed. Support	Web app prototype	T5, GPT-2, OpenAI	86.5% quiz accuracy	Bias, language limitations
[3] Orlanda-Ventayen et al.	Educator Perception	Qualitative	Scopus, ChatGPT	High awareness (80%)	No tool testing, self-reporting
[4] Chen et al.	Hospitality Education	Controlled experiment	ChatGPT, Azure	Higher scores & grit	Small sample size
[5] Bhatt et al.	Adaptive Learning	Pilot deployments	DreamBox, Knewton	Improved math, engagement	Privacy & access issues
[6] Llanos et al.	Higher Ed. Support	Controlled experiment	GPT-4, Pinecone	+1.5 grade, 91% on-time	Limited to one institution
[7] Oubibi et al.	Adult Learning	Design-based	Moodle, OUIP	Structured & flexible learning	Limited AI use
[8] Christou	AI in Education	Critical review	InfraNodus, ERIC	5 key themes on AI	Needs empirical validation

3 Comparitive analysis

4 Methodology

This research presents a web-based educational platform built upon a modular architecture, with each module designed to address a specific challenge in secondary education. The methodology integrates Natural Language Processing (NLP),deep learning, and transfer learning to develop four core functionalities: multiple-choice question (MCQ) generation,short note summarization, automated essay grading, and AI-driven story generation. The following subsections outline the implementation details of each component.

(a) MCQ Generation

Creating diverse and contextually accurate multiple-choice questions is a time intensive process for educators. Question-Answer Generation Using T5 Transformer The first stage leverages the T5 (Text-to-Text Transfer Transformer) model, fine-tuned on the Stanford Question Answering Dataset (SQuAD), to generate question-answer pairs from input texts.

Fig .1. shows the model was selected for its encoder-decoder architecture, which allows effective mapping from textual passages to questions and corresponding answers Distractor Creation via OpenAI Language Models The second stage uses OpenAI's language model to generate distractors—plausible but incorrect options. Unlike earlier approaches that rely solely on ontologies or part-ofspeech-based selection this system uses semantic context and transformer-driven generation, ensuring the distractors are logically sound and non-redundant with the correct answer [2].

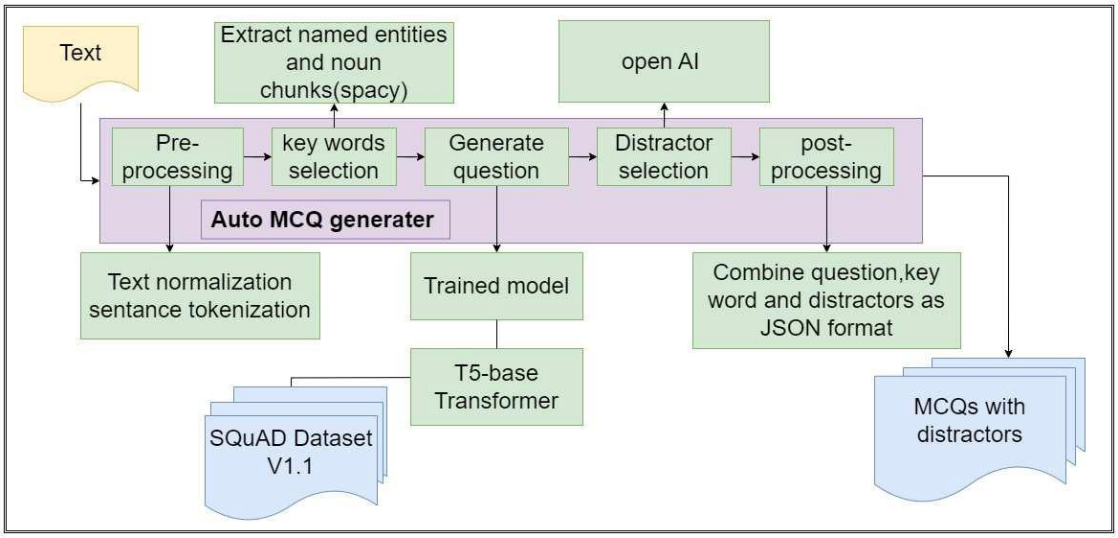


Fig. 1. Workflow of the MCQ generation.[Source:A.Anwar et al. [2]]

(b) Integration of AI and Education

P A Christou created a model called the AI-Education Paradigm Triangle, which shows how AI, education goals, and human values are connected.Fig.2. shows 5 Core Educational Themes:

Personalized Learning– AI can help tailor education to each student's needs, pace, and learning style,Intelligent Tutoring Systems– AI-powered tools can act like personal tutors, offering feedback, hints, and guidance, Assessment and Feedback– AI can grade assignments, generate quizzes, and provide real-time feedback to students, Educational Management – AI helps manage school systems, student performance tracking, and curriculum planning,Ethics and Human-AI Interaction– Focuses on how AI should respect human values, fairness, privacy, and support emotional learning.[8]

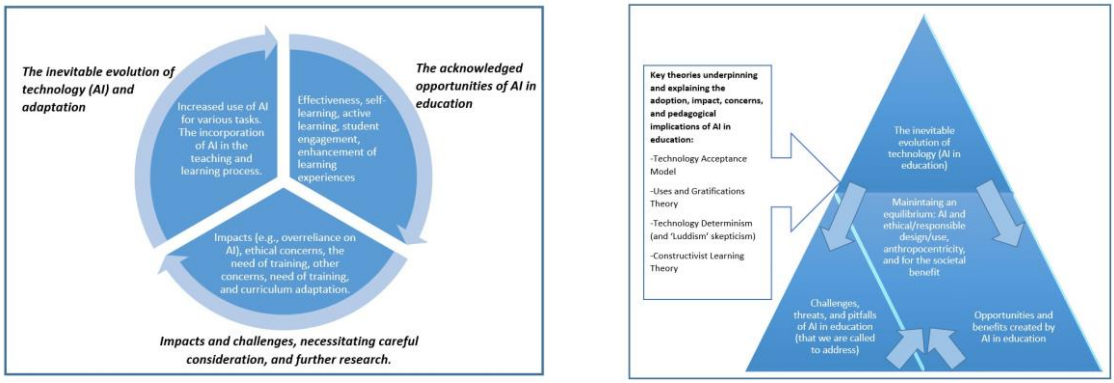


Fig.2. The circularity of AI in education with paradigm triangle[Source:P.A. Christou [8]].

5 Discussion

This Survey highlights how AI can revolutionize education by offering personalized learning and automating tasks like quiz generation and essay grading, aligning with findings from existing studies [2,3]. However, challenges such as AI-generated inaccuracies, ethical concerns, and limited language support persist, as noted in literature[3,8].The project's success in boosting engagement and efficiency suggests AI's potential, but its reliance on specific platforms and small-scale testing limits broader applicability. Future research should focus on multilingual support, ethical frameworks, and long-term impacts across diverse educational settings to ensure equitable and scalable AI integration.

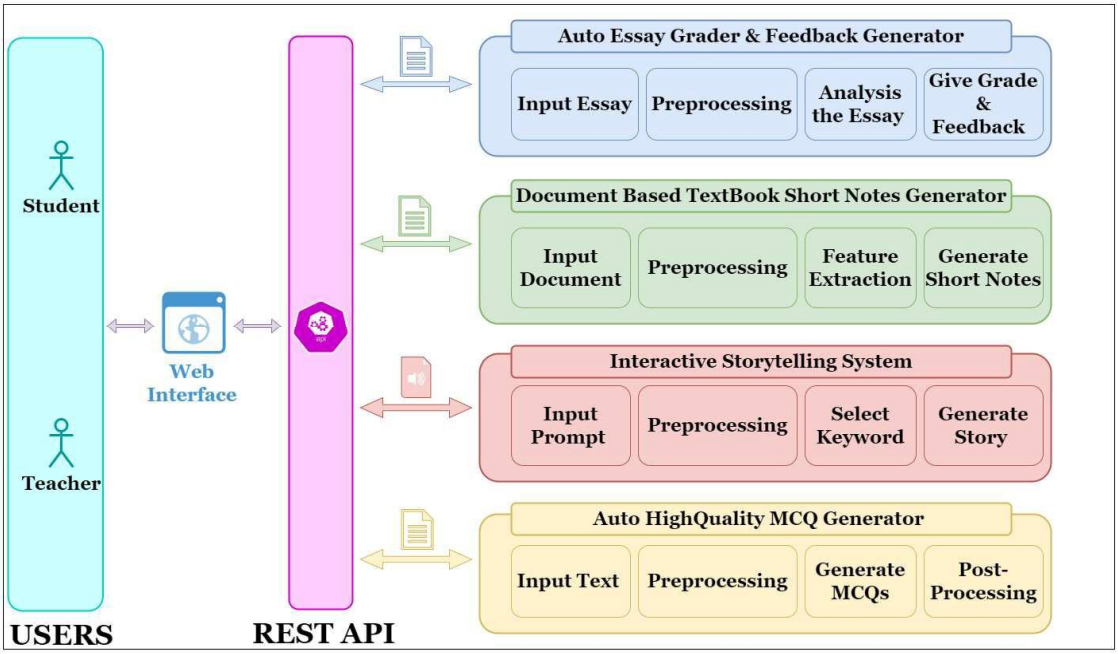


Fig.3. System architecture[Source:A.Anwar et al. [2]]

Fig.3. demonstrates how AI can transform education by making learning more personalized and easing the burden on teachers. By integrating tools like AI chatbots and automated quiz generators, the system provides students with instant support and tailored content, similar to findings from other studies. Teachers benefit too, as AI handles time-consuming tasks like grading and lesson planning, allowing them to focus on meaningful interactions with students. However, the technology isn't flawless—sometimes it produces errors or struggles with nuanced subjects, reminding us that human oversight remains essential.

While the project shows promising results in boosting student engagement and efficiency, challenges like data privacy, algorithmic bias, and accessibility gaps still loom large. For instance, if the AI isn't trained on diverse datasets, it might inadvertently favor certain learning styles or languages, leaving some students at a disadvantage. Additionally, the current system relies heavily on specific platforms, limiting its reach in under-resourced schools.

6 Conclusion

This survey showcases how AI can revolutionize education by making learning more personalized and efficient. By integrating smart chatbots and automated tools, it provides real-time support to students and eases the work.The system successfully improves assignment, grades, and accessibility while maintaining high-quality content. However, AI inaccuracies and ethical concerns highlights challenges.Overall, the survey proves the enhanced learning that can transform through AI platform. AI offers scalable, interactive and smart platform that adapts to diverse learning needs. The methodology proposed by different researchers demonstrate a significant step towards modernizing education through technology.

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