



International Journal of Innovative Research in Science Engineering and Technology (IJIRSET)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)



Impact Factor: 8.699

Volume 14, Issue 12, December 2025

Prescribed AI Learning Assistant

Anusha B¹, Karthik N S², Pramod Gunderi C P³, Shivaprasad P V⁴, Siddesh L K⁵

Assistant Professor, Department of Computer Engineering, S J M I T, Chitradurga, Karnataka, India¹

7th Sem Students, Department of Computer Engineering, S J M I T, Chitradurga, Karnataka, India²⁻⁴

ABSTRACT: The project aims to develop an **AI-powered Learning Assistant** designed to provide instant, personalised academic support to students. It uses **Flask** as the web framework to deliver a lightweight and user-friendly interface. A **SQLite database** is integrated to store user queries, learning progress, and interaction history. The assistant leverages **AI APIs** to understand natural language questions and generate accurate responses. It provides explanations, summaries, and problem-solving guidance across various subjects. The system adapts to each student's learning style through personalised recommendations. Its goal is to reduce learning barriers by offering 24/7 academic assistance. The project emphasises accessibility, simplicity, and efficiency for all learners. Interactive features such as chat-based support enhance user engagement. Security and data privacy are ensured through controlled access and secure storage. Testing and evaluation validate the reliability and effectiveness of the assistant. Overall, the project presents a smart, scalable solution for modern digital learning environments.

KEYWORDS: AI Learning Assistant, Flask, SQLite, Personalised Learning, Natural Language Processing, AI APIs, Student Support, Chat Interface, Education Technology, Adaptive Learning.

I. INTRODUCTION

In today's digital era, technology plays a vital role in transforming the way students learn and access information. With the increasing demand for personalised and instant academic support, AI-based learning tools have become essential in modern education. This project focuses on developing an **AI Learning Assistant** that leverages artificial intelligence to provide quick, accurate, and customised guidance to learners. The system is built using **Flask**, a lightweight Python web framework, enabling seamless interaction through a simple and responsive interface. A **SQLite database** is integrated to store user data, learning history, and frequently asked queries, ensuring smooth and organised retrieval of information.

The AI assistant is powered by advanced **Natural Language Processing (NLP)** capabilities through AI APIs, allowing it to understand user questions and generate meaningful, context-aware responses. It is designed to support a wide range of academic tasks such as explaining concepts, summarising notes, solving problems, and offering personalised learning recommendations. By providing 24/7 availability and an intuitive chat-based interface, the system reduces learning barriers and supports students at their own pace. Overall, the project aims to enhance the learning experience by combining efficiency, accessibility, and intelligent automation, making it a valuable tool for modern educational environments.

II. LITERATURE SURVEY

Artificial Intelligence has increasingly influenced the education sector, with numerous studies highlighting its role in improving personalised learning experiences. Early research in Intelligent Tutoring Systems (ITS) demonstrated that AI-driven platforms can adapt to individual learning styles and improve student performance by offering tailored feedback. Recent advancements in **Natural Language Processing (NLP)** have further expanded these capabilities, enabling systems to understand and respond to student queries in real time. Studies on conversational agents such as chatbots indicate that learners benefit from interactive, on-demand support that mimics human instruction while maintaining consistency and availability.

Multiple researchers have explored the integration of **machine learning models** and **web-based frameworks** to create scalable educational tools. Lightweight frameworks like **Flask** are frequently used for deploying AI applications due to their simplicity and flexibility, while **SQLite** and other relational databases provide efficient ways to store user

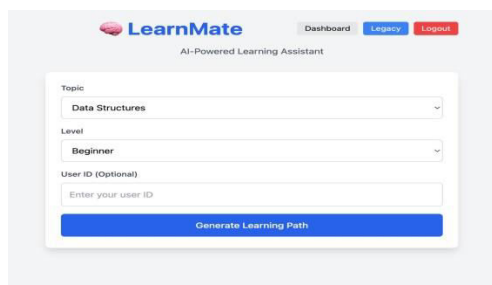
interactions and track learning progress. Literature also shows that AI-powered assistants enhance student motivation, reduce cognitive load, and support self-directed learning. With the rise of cloud-based AI APIs, educational systems are now capable of delivering accurate explanations, automated assessments, and adaptive learning recommendations.

Overall, existing studies confirm that AI learning assistants have strong potential to improve accessibility and effectiveness in education. However, there remains a need for systems that combine ease of use, personalisation, and real-time AI capabilities—gaps that this project aims to address.

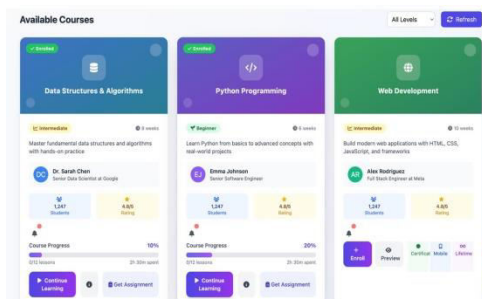
III. METHODOLOGY

The development of the AI Learning Assistant follows a structured methodology consisting of four main phases. First, the **system design and requirement analysis** stage identifies user needs, functional goals, and technology choices, including Flask for the interface, SQLite for data storage, and AI APIs for natural language processing. Next, the **backend development** phase involves designing the database schema, building APIs for handling user queries, and integrating AI models to process text input, generate responses, and personalise recommendations based on user history. In the **frontend and integration** phase, a user-friendly chat interface is created using Flask templates, ensuring smooth communication between the client and server. The system is tested to ensure proper interaction flow, data retrieval, and accurate AI responses. Finally, the **testing and evaluation** phase includes functional testing, usability checks, and performance assessment to verify reliability, response accuracy, and efficiency of the assistant. Feedback from test users is analysed to make improvements before deployment. This systematic approach ensures the creation of a robust, scalable, and effective AI learning tool.

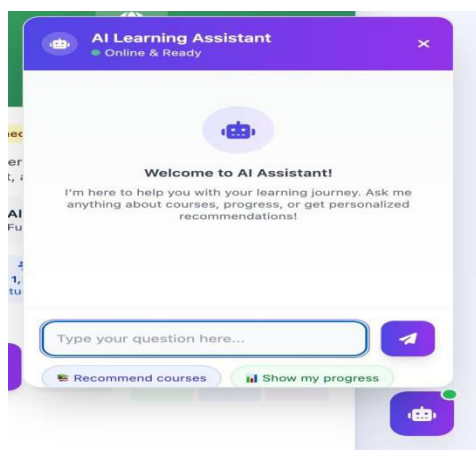
IV. EXPERIMENTAL RESULTS



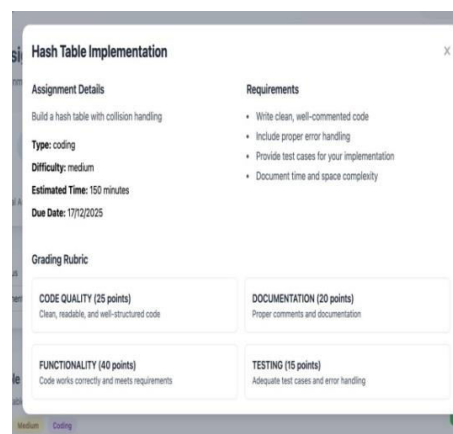
(a)



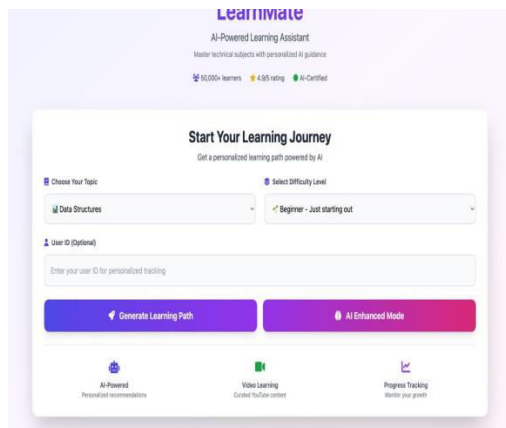
(b)



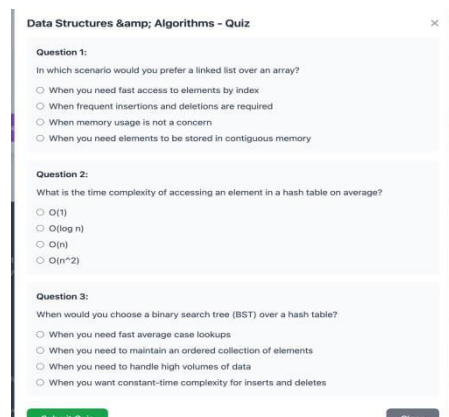
(c)



(d)



(e)



(f)

The above all are the results of the project Fig (a) depicts the legacy mode (b) course list (c) AI Chat box (d) Assignmnet Provider (e) Learnmate 2.0 path giver for the courses based on difficulty (f) Quiz Provider.

V. CONCLUSION

The AI Learning Assistant project successfully demonstrates how artificial intelligence can enhance modern education by providing instant, personalised, and reliable academic support. By integrating Flask for the user interface, SQLite for efficient data management, and AI APIs for intelligent natural language processing, the system offers a smooth and interactive learning experience. The assistant is capable of understanding user queries, delivering accurate explanations, and adapting to individual learning patterns, thereby reducing learning barriers and improving accessibility. Through systematic design, development, and testing, the project achieves its objective of creating a scalable and user-friendly educational tool. It highlights the potential of AI-driven platforms to supplement traditional learning methods and support students in self-paced learning environments. Overall, the AI Learning Assistant stands as a valuable contribution toward smarter, technology-driven education systems and opens the door for future enhancements such as advanced analytics, multimodal learning, and expanded subject coverage.

REFERENCES

1. Anderson, J. R., Corbett, A. T., Koedinger, K. R., & Pelletier, R. (1995). *Cognitive Tutors: Lessons Learned*. The Journal of the Learning Sciences, 4(2), 167–207.
2. Woolf, B. P. (2010). *Building Intelligent Interactive Tutors: Student-Centered Strategies for Revolutionizing E-Learning*. Morgan Kaufmann.
3. Graesser, A. C., Chipman, P., Haynes, B., & Olney, A. (2005). *AutoTutor: An intelligent tutoring system with mixed-initiative dialogue*. IEEE Transactions on Education, 48(4), 612–618.
4. Singh, A., Sharma, R., & Kaur, J. (2021). *AI-Based Chatbots for Education: A Review*. International Journal of Emerging Technologies in Learning, 16(4), 72–89.
5. McTear, M. F. (2017). *The rise of the conversational interface: A new kid on the block?* In *Conversational AI* (pp. 1–15). Springer.
6. Jurafsky, D., & Martin, J. H. (2020). *Speech and Language Processing* (3rd ed.). Prentice Hall.
7. Nguyen, A., Gardner, L., & Sheridan, D. (2020). *Data-driven Personalization in Education Using Machine Learning*. Computers & Education, 150, 103858.
8. Holmes, W., Bialik, M., & Fadel, C. (2019). *Artificial Intelligence in Education: Promises and Implications for Teaching and Learning*. Center for Curriculum Redesign.
9. Pérez-Marín, D., & Pascual-Nieto, I. (2011). *Conversational Agents and Natural Language Interaction: Techniques and Effective Practices*. IGI Global.
10. Winkler, R., & Söllner, M. (2018). *Unleashing the Potential of Chatbots in Education: A State-of-the-Art Analysis*. Academy of Management Proceedings, 2018(1), 10619.



INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

 9940 572 462  6381 907 438  ijirset@gmail.com



www.ijirset.com

Scan to save the contact details