

## AI SUGGESTIONS TO SUPPORT STUDENTS IN ACADEMICS

**T. Rajendar<sup>1</sup>, Syed Ishtiyahq Ahmed<sup>2</sup>, P. Mukesh<sup>3</sup>, U. Shiva Sharan<sup>4</sup>, K. Rithish<sup>5</sup>,  
Raziya Begum<sup>6</sup>**

<sup>1</sup> Assistant Professor, Department of CSE

Balaji Institute of Technology and Science, Laknepally, Warangal, India

<sup>2,3,4,5</sup> B.Tech Student, Department of CSE,

Balaji Institute of Technology and Science, Laknepally, Warangal, India

### ABSTRACT

Students in the traditional education system are facing a lot of challenges where the marks and grades are prioritized compared to the interests and skills of the students. The personal opinions and interests of individual students go unnoticed due to a lack of personalized guidance. So to fill this gap of personalized guidance and suggestions for the students to support them in academics Artificial Intelligence can be used. The main task would be to analyze the skills and interests of the students by conducting some short quizzes and tests. Then any AI model can be used to analyze the marks sheet, personal interests, and skills using the student's information and provide personal guidance to each student to help the students learn and improve in the concepts or subjects in which they are lagging and are interested. So this helps students to improve the skills they are interested in without stressing themselves and fills the gap of personal guidance between academics and students.

*Keywords - Students, Academics, Personalized Guidance, Artificial Intelligence, Education*

### 1. INTRODUCTION

The world has seen progress in many sectors but the most important sector is lagging which is the education sector not because of lack of innovation but because of lack of awareness. Although there have been some improvements in the education system such as the digitalization of education this has not significantly helped in the challenges faced by the students. The education system can gain significant improvement if the students are given personalized guidance based on their interests and weaknesses so that they can be encouraged to improve their skills in the fields they are interested in rather than forcing students to learn the students should be able to enjoy learning[1-15].

Let's start with a basic question, What is Education? The most common and simple answer would be transferring knowledge or skills. When we think about improvements made in education, the most common are virtual classes or tutors, online assessments, etc., which focus on 'How' knowledge is being transferred rather than 'What' knowledge is being transferred. To improve the quality of education the students need to be given individual personalized guidance which is difficult in the traditional one-to-many model of the

education system so we can integrate AI to provide personalized guidance to the individual students based on the interests and academic weaknesses of the students[16-24].

The students can take the help of AI in a more focused way so that the AI can analyze the data of the students and students’ preferences to help the students analyze their strengths and weaknesses and help improve themselves in academics so that the students are not in pressure due to challenges faced because of not understanding any topics which can be solved using AI to provide personalized suggestions to support students in their academics.

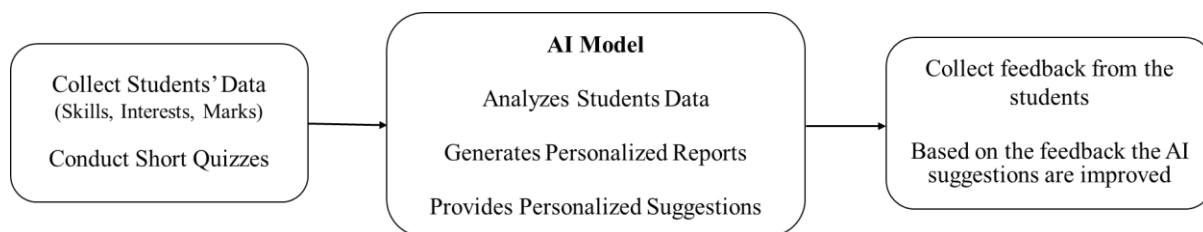


Fig. Process Flow Diagram

## 2. LITERATURE SURVEY

Title	Authors	Published Year	Objective	Limitation	Advantage
Harnessing AI for sustainable higher education: ethical considerations, operational efficiency, and future directions	Khan, Sunawar	2025	Discusses AI ethics, including data privacy.	Lack of rules and infrastructure to promote ethical AI integration	AI is trained to follow ethical rules as much as
A comprehensive review on generative AI for education.	Mittal, Uday, Siva Sai, and Vinay Chamola	2024	Discusses Applications, impact, and abilities of Generative AI for education.	Maintaining quality and consistency is difficult.	AI can be trained to provide more accurate and consistent data.
Exploring the role of AI in education.	Nguyen, Nathan D.	2023	Discusses and improves understanding of AI based on past use of AI in education.	AI can lack contextual understanding.	AI can be trained to understand the context more accurately.

State of the art and practice in AI in education	Holmes, Wayne, and Ilkka Tuomi	2022	Discusses Provides a review of existing AI systems.	Existing AI provides more generalized suggestions.	AI can be trained on students' data to provide personalized suggestions.
A Review of Artificial Intelligence (AI) in Education from 2010 to 2020.	Zhai, Xuesong	2021	Analyzes the trends and how AI is being applied to the education sector during 2010-2020.	The social and ethical issues may challenge AI in education.	AI can be used as a development tool for the smart learning environment.
Historical threads, missing links, and future directions in AI in education.	Williamson, Ben, and Rebecca Eynon	2020	Discusses the past, present, and future of AI in education.	AI can show algorithmic forms of bias and discrimination.	The AI can be trained to minimize bias and discrimination as much as possible.
AI and education: the importance of teacher and student relations.	Guilherme, Alex	2019	Analyzes the effect of technology on the connectedness of teachers and students.	The teachers cannot focus on many students at once hence the connectedness between students has decreased because of the increased digitalization of education.	The AI can act as a medium to assist teachers to interact with many students at once.

### 3. PROBLEM STATEMENT

The digitalization of education has been slightly helpful in providing education all over the world through the internet and digital content but the quality of education not only depends on ‘How’ the knowledge is being transferred but rather ‘What’ knowledge is being transferred.

Although there are some AI models and software that can provide students with the summarization of the desired topics they want to learn these are not personalized. There are

also AI models that can be used to give personal guidance but the AI models cannot provide personal guidance based on the strengths and weaknesses of the students which can be given using their information and preferences, in simple words these AI can lack contextual understanding of student's education and academics. The AI models are trained on a large amount of training data and the accuracy and consistency of AI and sometimes maintaining the quality and consistency can become difficult. The existing AI provides more generalized suggestions due to a lack of information about the students. There are also social and ethical issues that may challenge AI in education and there is a possibility of AI showing algorithmic forms of bias and discrimination.

#### 4. EXISTING SYSTEMS

While AI models are used to provide academic guidance and problem-solving, they need a working internet connection to use them. The students' or user data is sent to servers that are located at various locations all over the world which some companies may use or sell to other companies which can be a threat to the user privacy. The AI models also require high-end hardware while consuming a lot of resources to run on the servers which can increase the cost of maintenance which is the reason most of the AI models are pay-to-use and also expensive at the same time. These large AI models also leave a large carbon footprint which can be harmful to the environment. While there are AI models that are small and efficient but lack in providing personalized guidance due to lack of individual data.

#### 5. PROPOSED SYSTEM

The proposed system of AI that can support students in academics provides a good quality of education to the students and focuses on both aspects of 'How' the knowledge is being transferred and 'What' knowledge is being transferred. This AI model integrates with many tools and features such as text summarization, personalized suggestions, motivation, analyzing strengths and weaknesses of students, and providing academic guidance. The AI models require a lot of information such as training data, testing data, time, money, software, and hardware, so the proposed system of AI uses a pre-trained AI model to cut off the expenses and requirements. The social and ethical issues can be resolved by training AI with strict rules so that the proposed system of AI can minimize the possibility of showing forms of bias and discrimination. While the AI model works offline but internet connection is required for installation.

#### 6. REQUIREMENTS

##### Hardware Requirements

Component	Minimum Requirements	Recommended Requirements
CPU	Intel Core i5 (11th Gen)	Intel Core i7 / Ryzen 7 or better

RAM	8GB	16GB or more
Storage	20GB free space (HDD or SSD)	SSD(for faster I/O operations)
Operating System	Windows 10 / Linux (Ubuntu 20.04+)	Windows 11 / Ubuntu 22.04+
Internet Connection	Not required (Offline AI)	Optional (for updates)

### Software Requirements

Component	Minimum Requirements	Recommended Requirements
Operating System	Windows 10 / Linux (Ubuntu 20.04)	Windows 11 / Ubuntu 22.04
Python Version	Python 3.8+	Python 3.10+
Python Modules	flask, transformers, pandas, os, json	flask, transformers, pandas, os, json
LLM Model	SmolLM2-360M-Instruct	SmolLM2-360M-Instruct
Database	JSON (for storing user progress)	JSON (for storing user progress)
Dependency Manager	pip	pip
Browser	Chrome / Firefox	Chrome (for better DevTools)

## 7. SCREENSHOTS

**AI Student Guidance System** Welcome, Student!

**Take the quiz for more personalized experience**  
Our quiz is designed to analyze your skills, interests, and academic performance to provide personalized recommendations for your future.  
[Start Quiz](#)

**Personalized Academic Guidance**  
The traditional education system prioritizes marks over skills. Our AI-driven system helps students analyze their academic performance and interests to provide personalized guidance.  
[Try Our AI Counselor](#)

**About Our Project**  
We bridge the gap between students and academic guidance by analyzing their skills, interests, and academic performance to offer personalized recommendations. Our AI-powered system is designed to provide students with the best guidance for their future.  
[Change Theme](#)

CHAT HISTORY

10:09:59 AM  
Chat 1

Academic Counselor Chatbot

New Chat

Dark Mode

Save as PDF

Hi

Hello! How can I help you today?

I am interested in both science and technology but unsure whether to pursue engineering or research. Can you suggest a suitable career path based on my strengths?

Certainly! While it's great that you're interested in both science and technology, it's not necessarily a requirement to choose one over the other. However, having a strong foundation in one field can certainly help you excel in the other. Based on your strengths, I would suggest considering a career in research. As someone who enjoys both science and technology, you would have a unique perspective and skillset that could be valuable in a research role. Research involves a lot of theoretical work, which can be very fulfilling. Here's a possible career path to consider: 1. **Research Scientist**: In this role, you would contribute to the development of new technologies and scientific theories. This could involve conducting experiments, analyzing data, and writing papers. 2. **Science Writer**: If you enjoy communicating complex ideas to a general audience, this could be a good fit. You would write articles, reports, and guides that help to popularize scientific concepts and advancements. 3. **Science Educator**: If you have a passion for teaching and helping others understand scientific concepts, this could be a great career path. You would work with students, teachers, and parents to explain complex scientific topics in a way that is accessible and engaging. Remember, the key to a successful career in either field is to stay curious, be open to learning, and keep exploring. If you're interested in a particular field, consider conducting research on it and seeing if you can make a career out of it.

I struggle with mathematics but enjoy problem-solving. How can I improve my math skills while making learning more engaging?

I'm glad to hear that you enjoy problem-solving and that you're interested in improving your math skills. Here are some suggestions to make learning mathematics more engaging: 1. **Understand the concepts**: Don't just memorize formulas and rules. Understand the underlying principles and concepts. It's all about developing a deep understanding of the subject. 2. **Practice regularly**: Mathematics is a subject that requires a lot of practice. Make sure to practice problems regularly, even if it's just a few times a week. 3. **Work on real-life problems**: Mathematics is not just about formulas and rules. It's about solving problems in real life. Try to apply mathematical concepts to real-life problems. 4. **Use visual aids**: Visual aids such as graphs, charts, and diagrams can help you understand and remember mathematical concepts better. 5. **Join a study group**: Studying with a study group can be a great way to learn and understand the subject better. 6. **Take online courses**: Online courses can be very beneficial for improving your math skills. You can find many online courses that offer free access to a wide range of mathematics courses. 7. **Join a community**: There are many online communities where you can share your math problems and get help from other students. Remember, the goal is to make learning mathematics more enjoyable and to help you understand it better.

I want to improve my communication and leadership skills. Can you recommend exercises or activities to help me develop these skills?

Certainly, here are some exercises and activities that can help you improve your communication and leadership skills: 1. **Communication Skills Exercise**: Practice active listening by paying full attention to the speaker. Ask clarifying questions to ensure you understand their message. Show empathy by acknowledging their feelings and validating their experiences. Use "I" statements to express your thoughts instead of "you" statements, which can come across as accusatory. 2. **Leadership Exercise**: Identify a role or position you would like to take on. Research the job requirements and responsibilities. Create a short presentation or proposal outlining your qualifications and potential benefits. Practice delivering your presentation to a small group of friends or family members. 3. **Communication and Leadership Skills Quiz**: Take a quiz that evaluates your communication and leadership skills. The quiz will provide you with a score that can help you identify areas where you need improvement. 4. **Leadership Development Course**: Consider taking a leadership development course. These courses often provide structure, guidance, and feedback to help you improve. Remember, improving your communication and leadership skills takes time and practice. Be patient and persistent in your efforts.

Can you explain the concept of Newton's Laws of Motion in simple terms with real-life examples?

Sure! Newton's Laws of Motion are fundamental principles in physics that describe how objects move and interact with each other. They are often described as follows: 1. **First Law (Inertia)**: Every object wants to keep moving in its original state of motion. This means that if an object is not being acted upon by an external force, it will maintain its state of motion. For example, a book on a table will keep moving unless a force is applied to stop it. 2. **Second Law**: The amount of force applied to an object is directly proportional to the mass of the object. In simpler terms, more force is needed to move a heavier object than a lighter one. For example, if you throw a ball, the force of the throw is greater than if you threw a feather. 3. **Third Law**: For every action, there is an equal and opposite reaction. For example, when you throw a ball, the ground exerts an equal force on the ball that makes it move in the opposite direction. These laws are crucial in understanding how objects move and interact with each other. They help us understand the behavior of various objects and systems in the world around us.

I need a Python program to calculate the factorial of a number using recursion. Can you provide the code and explain how it works?

Certainly! Here's a Python program that calculates the factorial of a number using recursion:

```
def factorial(n):
    if n == 0 or n == 1:
        return 1
    else:
        return n * factorial(n - 1)

num = int(input("Enter a number: "))

print("Factorial of", num, "is:", factorial(num))
```

Explanation: This program defines a function called 'factorial' that takes an integer 'n' as input. If 'n' is 0 or 1, the function returns 1 (since the factorial of 0 and 1 is 1). Otherwise, the function calls itself with 'n - 1' and multiplies the result by 'n'. This is the recursive step. The main part of the program asks the user to input a number, calculates the factorial using the 'factorial' function, and then prints the result. For example, if you enter '6', the program will calculate the factorial of 6 using the recursive approach: 'factorial(6)' calls 'factorial(5)' - 'factorial(5)' calls 'factorial(4)' - 'factorial(4)' calls 'factorial(3)' - 'factorial(3)' calls 'factorial(2)' - 'factorial(2)' calls 'factorial(1)' - 'factorial(1)' returns 1 (since the factorial of 1 is 1) - 'factorial(2)' returns 2 \* 1 = 2 - 'factorial(3)' returns 3 \* 2 = 6 - 'factorial(4)' returns 4 \* 6 = 24 - 'factorial(5)' returns 5 \* 24 = 120 - 'factorial(6)' returns 6 \* 120 = 720. The final result will be printed as '6! = 720'.

Ask about career guidance, study tips...

Send

## 8. CONCLUSION

The project focuses on showing the potential of Artificial Intelligence(AI) in the educational sector. There are existing AI models that require a lot of resources such as RAM, GPU, and Storage to handle the tasks related to the AI model which increases the cost to implement an AI model so to use such AI models is expensive. Also, the project focuses on providing a secure environment to the user by maintaining the user information locally along with the AI model. So both data storage and processing using the AI model are done locally on the user's system. This will help maintain the privacy of the user and make the AI model useable even when the user is not connected to the internet. While the installation may require an internet connection after the installation is done the AI model runs on the user's system locally. So that this project can provide quality education, personalized guidance, academic assistance, doubt-solving, career guidance, skill development, study strategy and programming assistance. While maintaining both user data and the AI model locally the AI model uses fewer resources compared to the large AI models while giving responses with good enough accuracy which makes the AI model to be reliable and compatible with most modern-day devices or systems. The AI model is fine-tuned or given suitable prompts to make it suitable to act as an academic counsellor to assist students with their academic needs and also can give personalized suggestions to the students.

## REFERENCES

1. Khan, Sunawar, et al. "Harnessing AI for sustainable higher education: ethical considerations, operational efficiency, and future directions." *Discover Sustainability* 6.1 (2025): 23.
2. Mittal, Uday, Siva Sai, and Vinay Chamola. "A comprehensive review on generative AI for education." *IEEE Access* (2024).
3. Nguyen, Nathan D. "Exploring the role of AI in education." *London Journal of Social Sciences* 6 (2023): 84-95.
4. Holmes, Wayne, and Ilkka Tuomi. "State of the art and practice in AI in education." *European Journal of Education* 57.4 (2022): 542-570.
5. Zhai, Xuesong, et al. "A Review of Artificial Intelligence (AI) in Education from 2010 to 2020." *Complexity* 2021.1 (2021): 8812542.
6. Williamson, Ben, and Rebecca Eynon. "Historical threads, missing links, and future directions in AI in education." *Learning, Media and Technology* 45.3 (2020): 223-235.
7. Guilherme, Alex. "AI and education: the importance of teacher and student relations." *AI & society* 34 (2019): 47-54.
8. Ramdas Vankdothu,Dr.Mohd Abdul Hameed, Husnah Fatima” A Brain Tumor Identification and

- Classification Using Deep Learning based on CNN-LSTM Method” *Computers and Electrical Engineering* , 101 (2022) 107960
9. Ramdas Vankdothu, Mohd Abdul Hameed “Adaptive features selection and EDNN based brain image recognition on the internet of medical things”, *Computers and Electrical Engineering* , 103 (2022) 108338.
  10. Ramdas Vankdothu, Mohd Abdul Hameed, Ayesha Ameen, Raheem, Unnisa “ Brain image identification and classification on Internet of Medical Things in healthcare system using support value based deep neural network” *Computers and Electrical Engineering*, 102(2022) 108196.
  11. Ramdas Vankdothu, Mohd Abdul Hameed” Brain tumor segmentation of MR images using SVM and fuzzy classifier in machine learning” *Measurement: Sensors Journal*, Volume 24, 2022, 100440 .
  12. Ramdas Vankdothu, Mohd Abdul Hameed” Brain tumor MRI images identification and classification based on the recurrent convolutional neural network” *Measurement: Sensors Journal*, Volume 24, 2022, 100412 .
  13. Bhukya Madhu, M.Venu Gopala Chari, Ramdas Vankdothu, Arun Kumar Silivery, Veerender Aerranagula ” Intrusion detection models for IOT networks via deep learning approaches ” *Measurement: Sensors Journal*, Volume 25, 2022, 100641
  14. Mohd Thousif Ahemad ,Mohd Abdul Hameed, Ramdas Vankdothu” COVID-19 detection and classification for machine learning methods using human genomic data” *Measurement: Sensors Journal*, Volume 24, 2022, 100537
  15. S. Rakesh <sup>a</sup>, Nagaratna P. Hegde <sup>b</sup>, M. Venu Gopalachari <sup>c</sup>, D. Jayaram <sup>c</sup>, Bhukya Madhu <sup>d</sup>, Mohd Abdul Hameed <sup>a</sup>, Ramdas Vankdothu <sup>e</sup>, L.K. Suresh Kumar “Moving object detection using modified GMM based background subtraction” *Measurement: Sensors Journal*, Volume 30, 2023, 100898
  16. Ramdas Vankdothu, Dr. Mohd Abdul Hameed, Husnah Fatima “Efficient Detection of Brain Tumor Using Unsupervised Modified Deep Belief Network in Big Data” *Journal of Adv Research in Dynamical & Control Systems*, Vol. 12, 2020.
  17. Ramdas Vankdothu, Dr. Mohd Abdul Hameed, Husnah Fatima “Internet of Medical Things of Brain Image Recognition Algorithm and High Performance Computing by Convolutional Neural Network” *International Journal of Advanced Science and Technology*, Vol. 29, No. 6, (2020), pp. 2875 – 2881
  18. Ramdas Vankdothu, Dr. Mohd Abdul Hameed, Husnah Fatima “Convolutional Neural Network-Based Brain Image Recognition Algorithm And High-Performance Computing”, *Journal Of Critical Reviews*, Vol 7, Issue 08, 2020 (Scopus Indexed)
  19. Ramdas Vankdothu, Dr. Mohd Abdul Hameed “A Security Applicable with Deep Learning Algorithm for Big Data Analysis”, *Test Engineering & Management Journal*, January-February 2020
  20. Ramdas Vankdothu, G. Shyama Chandra Prasad “ A Study on Privacy Applicable Deep Learning Schemes for Big Data” *Complexity International Journal*, Volume 23, Issue 2, July-August 2019
  21. Ramdas Vankdothu, Dr. Mohd Abdul Hameed, Husnah Fatima “ Brain Image Recognition using Internet of Medical Things based Support Value based Adaptive Deep Neural Network” *The International journal of analytical and experimental modal analysis*, Volume XII, Issue IV, April/2020
  22. Ramdas Vankdothu, Dr. Mohd Abdul Hameed, Husnah Fatima” Adaptive Features Selection and EDNN

based Brain Image Recognition In Internet Of Medical Things “ Journal of Engineering Sciences, Vol 11, Issue 4 , April/ 2020(UGC Care Journal)

23. Ramdas Vankdothu, Dr.Mohd Abdul Hameed “ Implementation of a Privacy based Deep Learning Algorithm for Big Data Analytics”, Complexity International Journal , Volume 24, Issue 01, Jan 2020
24. Ramdas Vankdothu, G. Shyama Chandra Prasad” A Survey On Big Data Analytics: Challenges, Open Research Issues and Tools” International Journal For Innovative Engineering and Management Research, Vol 08 Issue08, Aug 2019

## AUTHORS



I am the Syed Ishtiyahq Ahmed, currently pursuing a Bachelor’s degree in Computer Science Engineering at Balaji Institute of Technology and Science. My research in pretrained AI models was focused on this project. As the Programmer and Web Developer, I was responsible for overseeing the design and development of the website, pretrained AI model ensuring it was functional, user-friendly, and optimized.



I am Penta Mukesh, a third-year Computer Science Engineering student at Balaji Institute of Technology and Science. In my role as Quality Assurance, I ensured the website’s performance, security, and usability by conducting thorough testing and identifying and fixing bugs to maintain a seamless user experience.



I am K. Rithish, currently in my third year of the Bachelor's degree program in Computer Science Engineering at Balaji Institute of Technology and Science. As the Data Analyst, I focused on gathering and analyzing user data to understand behavior and improve the website’s functionality.



I am U. Shiva Sharan, a third-year student pursuing a Bachelor's degree in Computer Science Engineering at Balaji Institute of Technology and Science. As the Graphic Designer, I was responsible for the visual design of the website, ensuring an attractive and engaging interface.