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Increasing use of Artificial Intelligence Based Language Model ChatGPT in Education Possibilities and Challenges

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Abstract

Artificial Intelligence (AI) based technology has developed so rapidly in the last about a decade that it has become a part of our lives in some form or the other in today's time. The National Education Policy 2020 has made several provisions for proper inclusion of A.I. in education. The recognition of A.I. as a subject at the upper primary level, undergraduate and postgraduate levels reflects its growing importance. A chatbot is a type of AI-based language model that is trained to interact with humans. Over the past decades, many types of chatbots have been developed that can respond to human responses for a particular purpose or perspective, but the amount of excitement and surprise that has been seen for ChatGPT is extraordinary. As its advanced versions came out, it is being discussed among the academicians, researchers and people having knowledge of technology, mainly because of its accuracy and reliability. In fact, ChatGPT is the most powerful A.I. based conversational model to date, trained by human reinforcement based on the vast knowledge base that exists on the Internet. It is capable of understanding natural language. When asked about a problem or a question, one can provide answers based on rational and critical thinking like humans. Over the years, ChatGPT has become increasingly used in the education sector. This article presents a nuanced analysis of the new possibilities and challenges arising from the growing use of ChatGPT in education.

1. Introduction

The world is changing at a rapid pace. It is anticipated that at present, due to the increasing use of Big Data, Machine Learning and Artificial Intelligence, a large number of unskilled workers will be replaced by machines (National Education Policy, 2020). The National Education Policy 2020 believes that machine learning, data science and artificial intelligence will be very important for the development of mathematical thinking in students to make India a leader in various fields in the future. For this, the curriculum should properly incorporate contemporary topics such as Artificial Intelligence, Design Thinking, Holistic Health, Biological Life, etc. National Education Policy 2020, page 15). India is among the countries that are rapidly producing professional workers who will be trained in cutting-edge areas such as artificial intelligence, 3-D machining, big data analysis and machine learning. These professional workers will definitely help in taking India to a position of excellence in the world in important areas like technical education, genomic studies,

biotechnology, nanotechnology, neuroscience, etc. In such a situation, the need to create an understanding of artificial intelligence among students and its meaningful inclusion in the curriculum from school education to higher education can be understood properly. In such a situation, the importance of artificial intelligence-based chatbots like ChatGPT in the field of education increases significantly, because its rational use can reduce the problems faced at many levels of education. At the same time, its irresponsible use can also give rise to some new challenges. Realizing the importance of AI, the Government of India has taken a number of important steps in the field of education for its promotion and use in proper moral development, some of which are as follows:

Responsible AI for Youth: A.I. and real time applications in education can definitely play a big role in acquiring new skills in students. Department of e-Governance, Ministry of Electronics and Information Technology, Government of India has launched Responsible AI programme at the national level for the youth. The main objective of this program is to

address the lack of technology and A.I. related skills among the students of government schools.

AI Portal-With the joint efforts of the Ministry of Electronics and Information Technology, Government of India and the non-governmental organization NASSCOM, a portal has been developed where individuals with different backgrounds and educational qualifications can connect to this portal. The main objective of this portal is to make information, resources and innovations related to A.I. available on a single platform and reach all individuals.

The International Research Foundation: Research and development plays an important role in the development of any field. Research in different fields can be taken to a different dimension by A.I. Therefore, the National Education Policy 2020 recognizing this potential has proposed a National Research Foundation to strengthen the synergy between R & D, industry and academia so that the gap between these different bodies can be bridged.

Apart from this, in the field of education, important programs like A.I. for All, National Strategy of A.I. for Education, Atal A.I. Lab, Virtual Lab and A.I. Curriculum 2019 under Skill Based Education run by the Central Board of Secondary Education are being run. The objective of these programs is to familiarize the students with A.I. based technologies and skills and prepares them for the needs of the 21st century. It is the endeavour of the Government of India to use A.I. based technologies at the school level to familiarize the students with the correct selection and ethical use of tools like chatbots so that learning related problems can be reduced.

Chatbot: For the first time in the decade of 1964, humans started building machines that could talk to them or respond to them. Named Eliza, this machine was a keyboard-based response machine, in which input had to be given from the keyboard and this machine responded relative to it. In 1995, another chatbot named Alice was developed, which created new possibilities for the then generation with hope and curiosity. After about 10 years of this, advanced chatbots like Amazon Alexa, Google Now, Siri came into existence, which could recognize the voice of humans and give their feedback based on it. It can be said with certainty that with the coming into existence of this chatbot, special enthusiasm has been seen among the people working in the field of artificial intelligence. In November 2022, OpenAI, a company working on artificial intelligence, presented a modern advanced type of chatbot named ChatGPT to the world for the first time. With the advent of this chatbot, a discussion started that to what extent a chatbot based on artificial intelligence can give answers to problems like humans with great accuracy.

As already mentioned, ChatGPT is a modern chatbot with advanced DA.I.s from OpenA.I., a US-based company. It is more advanced than earlier available chatbots such as Amazon Alexa, Google Assistant, Apple's Siri. It can give a detailed and comprehensive answer when asked a problem or question, just like humans, rather than communicating with the world. For example, if you were to ask this chatbot what the global consequences of the current war between Russia and Ukraine would be, explain in 500 words. So it very accurately presents to you in a few moments an answer based on arguments within 500 words that appears to be written by a human being.

ChatGPT has some qualities within itself, due to which the users who use it are surprised. It has been tuned to the vast encyclopedia of the Internet in such a way that it can display the following features:

Able to Understand Natural Language

- It can communicate.
- He admits his mistakes.
- It is capable of answering follow-up questions.
- It can challenge questions made on wrong grounds.
- It denies unreasonable requests.
- It can provide more detailed information based on conversations than other chatbots.
- It uses about 570 GB of internet data to present solutions to a variety of problems.
- It is a kind of language model, which can generate text and it gives results like human interaction under normal circumstances.

Apart from this, it can also do tasks like classifying text, answering questions, creating text, summarizing text, identifying named units, etc. with utmost ease and accuracy. It can generate these types of chatbots, which can directly talk to the students, which can help them to do better in the field of education. ChatGPT is a type of generative pre-train transformer architecture, which is trained on the basis of extensive data available on the internet. It work son a neural network.

Ural Network: It can be a large network of computers, which can further improve its output by itself, the inputs that are given to it during several stages of training. It generates a response based on interaction by understanding the context. Able to write poems, stories and essay

2. What is GPT?

- ChatGpt is an A.I. based conversational model developed by Open A.I. This language is part of the GPT (Generative Pre-Train Transformer) family of models. ChatGPT is designed to engage in interactive and dynamic conversations with users. It provides human-like responses in a very effective manner when users input their queries into it in the form of text. Sometimes it becomes very difficult to distinguish whether the answer received by the user is written by the person himself after his experience and deep reflection or it is generated by the A.I. based language model ChatGPT.
- It is because of the accuracy and authenticity of the answers received by ChatGPT that this A.I. based conversational model remains a subject of curiosity and curiosity for academics all over the world. It is a model that can be used at almost every level of education in different areas as per the need.
- ChatGPT is trained on a large corpus of text data present on the Internet, allowing it to generate contextually coherent text. It is a powerful language model that can understand natural language cues and generate meaningful responses.
- OpenAI has developed ChatGPT using reinforcement-based learning from human feedback. The process of its creation involved human reviewers, who provided ratings and feedback on various model-generated responses. This allows the model to improve its performance over time, and more refined and refined versions of it have come to us.
- ChatGPT displays content in plain language. It is important to note that this is an A.I. model and has some limitations. It can sometimes produce inaccurate or nonsensical responses, so it should not be considered a source of absolute truthful knowledge. Users should be

careful when using it and evaluate the output provided by ChatGPT.

A Brief History of ChatGPT
The history of ChatGPT is closely tied to the development of the language model of Open A.I. A brief description of the evolution of ChatGPT so far is given in Figure 1.
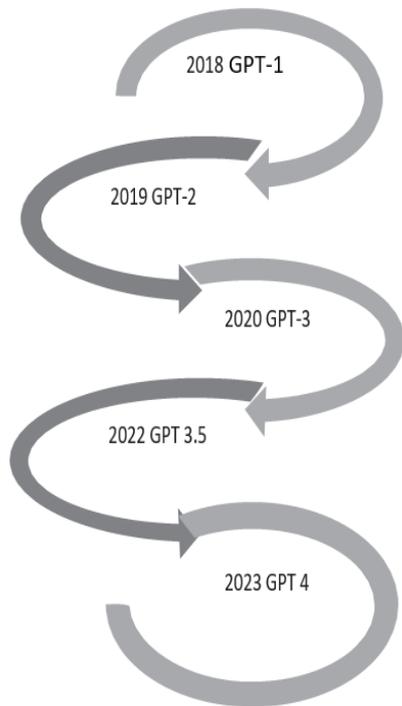

Fig 1: Brief chronology of ChatGPT

GPT 1: OpenAI released the first version of Generative Pre-Trend Transformer (GPT-1) in 2018. GPT 1 was a language model, which was trained on a large amount of text data from the Internet. It had demonstrated impressive capabilities in generating text coherently and contextually.

GPT 2: OpenAI released an enhanced version of this model, GPT2, in 2019. GPT2 attracted attention for its ability to generate highly realistic and coherent text, raising concerns about the potential misuse of such technology. To prevent potential misuse as a result, Open A.I. initially allowed limited use of GPT2. Open A.I. 's decision to restrict access to GPT2 prompted widespread discussion on the ethical and security implications of the Shakishali language model. The

goal of Open A.I. was to balance the benefits of A.I. with responsible planning, so it was necessary to keep these things in mind when developing later versions.

GPT 3: In June 2020, Open A.I.N produced GPT 3, the largest and most powerful language model at the time. GPT 3 was trained on a huge corpus of diverse text. This enabled it to generate highly coherent and contextually rich responses. GPT 3 had attracted attention for its impressive linguistic capabilities and potential applications in various fields.

GPT 3.5: Building on the success of GPT 3, OpenAI launched GPT 3.5, an adaptation of the language model designed for conversational interaction. This version of ChatGPT was specifically developed to improve one's communicative abilities by using reinforcement-based learning from human feedback to provide more useful and contextually appropriate feedback.

Open AI API: OpenAI introduced the OpenAI API in 2021, allowing developers and organizations to use ChatGPT's capabilities in their own applications. OpenAI A.P.I. made possible the integration of ChatGPT, expanding the potential applications of ChatGPT to different sectors, cases, levels, devices and services.

GPT 4: This is the most recent version of ChatGPT to date, which was released to users in December 2022 by the OpenA.I. company. This new model had multi-dimensional language dimensions, which could take both text and pictures as input and it is capable of providing written output as feedback. Certainly it was more refined and accurate than the earlier versions.

3. How is ChatGPT Different from other Available Chatbots?
ChatGPT is built on a generative pre-trend transformer architecture, which is trained on large amounts of text data from the Internet. This enables ChatGPT to understand and generate human-like text responses across a wide range of topics. Its training on diverse data sources provides it with a broad knowledge base. ChatGPT is different from other chatbots currently in vogue (Alexa, Siri, Google Assistant, Bixby, etc.).

It is important to note that the features of other chatbots may vary depending on the specific implementation, design, and training methodology. Table 1 presents the common differences by general overview between ChatGPT and other chatbot systems.

Table 1: Differences between ChatGPT and other available chat bots

	ChatGPT	Other chatbots (e.g. Alexa, Siri, Google Assistant, Bixby, etc.)
The understanding of language	It understands natural language cues and contextual responses.	These can have different levels of language understanding, often based on predetermined rules or patterns.
Continue reference	Maintains context from previous messages during conversations while providing consistent and competent responses.	There may be a lack of context awareness and respond to each input independently without considering the conversation history.
Knowledge base	It is trained by a vast corpus of internet text data, providing a broad knowledge base.	Training may be limited knowledge or field-specific, depending on the data and purpose.
Adaptation	Open AI.A.P.I allows developers to integrate ChatGPT and customize its functionality.	Some chatbots offer limited customization options, which are usually limited to predefine templates or rules.
Training approach	Consistently improves performance with accuracy using learning based on reinforcement from human feedback.	Depending on the implementation can be trained using supervised learning, rule-based system or other techniques.
Open-ended dialog	It encourages open communication and can generate constructive responses.	Can focus on the use of specific cases or provide more structured, template-based responses.
Application	Versatile and adaptable to different uses or cases due to its general purpose nature.	Often designed for specific applications or cases to meet specific needs.
Availability	Accessible through Open A.I.A.P.I. for developers to integrate into their own applications.	The chatbot is available through different platforms, frameworks, or services depending on the provider.

The potential educational benefits of ChatGPT are notable in that ChatGPT is an A.I. based most powerful language model to date, giving users the same responses as humans. The growing trend of ChatGPT at different levels of education can have many educational benefits. Although ChatGPT has many educational benefits, it should not be considered as a replacement for human teachers. The expertise, empathy and adaptability of human teachers are important to promote holistic development, provide personal guidance and support the socio-emotional needs of students. ChatGPT should be seen as a complementary tool to enhance the learning experience rather than a substitute for human interaction and instruction. (Jinglong, Zhou *et al*., 2023) The potential benefits from the increased use of ChatGPT in education are described as follows:

1. **In Fact, Education:** ChatGPT can provide personalized learning experiences by customizing the information and explanations according to the individual needs and learning style of the students. It can customize its responses based on the user's level of understanding, helping them understand complex concepts at their own pace.
2. **Quick Access to Knowledge:** Based on its vast encyclopedia, ChatGPT can quickly provide information on a variety of topics, making it a valuable tool for research and learning. This allows students to ask questions and get instant answers, allowing them to explore different concepts in real time and expand their knowledge
   - **Virtual Tutoring:** ChatGPT can act as a virtual tutor, providing clarifications, examples and guidance to students in an interactive manner. It can help in problem-solving, provide step by step instructions, provide feedback on assignments It will also promote independent learning and critical thinking.
   - **Language Learning and Practice:** Language learners can practice language learning by engaging in conversations with ChatGPT. Students can practice speaking, listening, reading, and writing skills by interacting with the A.I. to improve their acquisition of a new language, and receiving suggestions.
   - **Accessibility and Inclusivity:** ChatGPT can address accessibility challenges by providing alternative learning formats. It can convert text into speech and help visually impaired students. One can provide translation services for students speaking other languages and promote inclusiveness in education.
3. **Creative Writing and Storytelling:** ChatGPT can serve as a tool for creative writing and storytelling practice. Students can collaborate with A.I.M. modules like ChatGPT to generate ideas, receive writing prompts and explore different narrative structures, enhancing their creativity and language expression. Moral and critical thinking. Engaging with ChatGPT encourages students to think critically about the information they receive. They can evaluate the reliability of A.I. generated responses. They can identify biases and develop the necessary media literacy skills to navigate complex information landscapes faster.
4. **Exploring Complex Concepts:** ChatGPT can simplify complex concepts and provide intuitive explanations, allowing students to explore topics that may be challenging. It can break complex ideas into parts to make them simple and understandable, facilitate the lesson and encourage deep learning.

4. How is ChatGPT Helpful for Teachers?
ChatGPT can serve as a helpful tool for teachers in a number of ways, described as follows:

1. **To Create a Lesson Plan:** Teachers can use ChatGPT to brainstorm ideas and gather resources for lesson planning. They can ask for suggestions on engaging activities, teaching strategies, or content related to specific topics. ChatGPT can provide a variety of views. This can help teachers find new ways to keep students engaged with the content being taught.
2. **For the Support of Materials to be used:** If teachers need clarification or additional information on a particular topic, they can use ChatGPT for clarification or example. ChatGPT can provide brief explanations, present examples, practice or even generate sample problems to reinforce the concepts to be taught.
3. **To Differentiate:** ChatGPT can assist teachers in differentiation by providing ideas and strategies for adapting lessons to meet the diverse needs of students. Teachers can seek suggestions from CHATGPT on proposed activities for learning, necessary modifications in the content to help students of different abilities present in the class and based on their learning styles.
4. **To Encourage Engagement of Students in Learning:** Teachers can use ChatGPT to enhance student engagement by incorporating technology in the classroom. For example, they can have students interact with ChatGPT during lessons as a way to ask questions, get explanations, or discuss ideas. This can make learning more interactive and engaging for students.
5. **In the Development of Language and Literacy:** ChatGPT can be a valuable resource to support language development and literacy skills in early learners. Teachers can ask questions from it to help with vocabulary definition, sentence structure suggestions, or grammar and spelling. They can also use ChatGPT to demonstrate the proper use of language in different contexts as a model.
6. **Strengthening Professional Development in Teachers:** Teachers can easily use ChatGPT to access professional development resources and receive guidance on specific teaching strategies or approaches. ChatGPT can provide information about current best practices, research-based methods, or suggest resources for future research studies. Despite the many benefits of ChatGPT, it cannot replace the expertise and guidance of a trained teacher. The responses to ChatGPT should always be critically evaluated and teachers should use their professional judgment in incorporating the information provided into their teaching practices (Rasool *et al*., 2023).

5. Potential Challenges Arising from Increased use of AI-based Language Model ChatGPT in Education
The increasing use of ChatGPT and similar A.I. technologies in education may pose several challenges that need to be carefully considered. A few of the challenges are:
AI Dependency-Over-reliance on AI tools such as ChatGPT can potentially affect critical skills such as critical thinking and problem solving in students. If students rely too much on AI for answers, they may not be willing to engage in independent research, analysis, and reflection. Accuracy and Reliability ChatGPT has made significant progress over the

years, yet it is not immune to errors, biases, or generating false information. Teachers should be careful before using an A.I. model and verify the accuracy of the information generated by the A.I. model. It is important to teach students how to critically evaluate and fact-check the responses they receive from this type of model.

- Political thought the use of A.I. in education raises ethical concerns such as privacy, the protection of providers, and consent. Interactions between students and A.I. devices may involve the collection and storage of sensitive data. Teachers and institutions should ensure that appropriate safeguards are put in place to protect the privacy and well-being of students.
- Equality and accessibility Unequal access to technology can exacerbate educational inequalities. If the use of ChatGPT becomes prevalent in classrooms, students without such technology or a reliable internet connection may be at a disadvantage. Efforts should be made to ensure equitable access to A.I. tools and bridge the digital divide.
- Loss of human involvement. Increasing reliance on A.I. devices can reduce opportunities for human interaction and individual feedback in the learning process. Meaningful teacher-student relationships and collaborative learning experiences play an important role in education and should not be undermined by technology.
- Responsible use and bias mitigation Digital content developers and educators must work together to overcome biases, because the data on which A.I. models like ChatGPT are trained can suffer from data bias. Steps should be taken to identify and reduce biases to ensure that

6. A.I. Tools Promote Inclusivity, Diversity and Fairness in Education

Qualified teaching experience. A.I. tools like ChatGPT may not always provide authentic, real-world learning experiences. They are motivated to use A.I. as a support resource and to use it for imparting moral education in academics based on the accuracy and authenticity of experimental, non-experimental, responses to students, as the use of such A.I. models promotes inclusion in education. It is well known that every student has different learning abilities and dynamics. In such a situation, the use of such A.I. tools can help a large number of students with disabilities and provide them with a common accessible environment. GPT 4, the latest version of ChatGPT, is the most advanced A.I. based language model to date, which can help students, teachers and school heads at different levels of education in multiple ways. But the increasing use of ChatGPT in education also points to some concerns coming up in the future. Since ChatGPT is capable of providing human interaction-like feedback in an incredible way, it should be used to strengthen the student-teacher relationship in education. The feedback received after using such an A.I. model must be evaluated. It should not be used as a substitute for the teacher in the classroom. The rapidity of answering, the accuracy and reliability of the answer should prevent students from using it as a habit. Academicians believe that overuse of ChatGPT in education can lead to the loss of very important skills such as critical thinking, analysis and learning by doing. So how to use powerful AI tools like ChatGPT in education and how much to have? There should be serious brainstorming on this so that the A.I. based tools as a whole become our allies in learning and ensure their ethical use in education.

References

1. Gill S, Rupinder Kaur. Vision and Challenge. Retrieved 20 March 2023 from https://www.researchgate.net/publication/370707926 _ ChatGPT _ Vision _ and _ challenges.
2. Jinglong Zhou. Others. Ethical ChatGPT-Concerns, Challenges and Commands, 2023. https://www.researchgate.net/publication/370869499 _ Ethical _ ChatGPT _ Concerns _ Challenges _ and _ Commandments.
3. Policy. National Strategy for Artificial Intelligence (AI). Government of India, Govt. June 22, 2023 at https://niti.gov.in/sites/default/files/2019-01/National-Strategy-for-AI-Discussion-Paper. Obtained from the pdf, 2018.
4. Ministry of Human Resource Development. 2020. National Education Policy 2020. Ministry of Human Resource Development, Government of India, New Delhi. Retrieved 10 June 2023 from https://www.education.gov.in/sites/upload_files/mhrd/files/NEP _ Final _ English _ 0.pdf.
5. Rasool Tariq. Others until 2023. Darol of ChatGPT in Higher Education-Benefits, Challenges and Future Research Direction. Journal of Applied Learning and Teaching. Retrieved 26 March 2023 from https://doi.org/10.37074/jalt. 2023.6.1.29.
6. Alkaabi A. *et al*. ChatGPT in higher education: Opportunities, challenges, and required competencies. Journal of Education and e-Learning Research, 2025.
7. Sarkar K, Awal A. Ethics in the application of ChatGPT in education. Redshine Archive, 2024.
8. Yan L, *et al*. Practical & ethical challenges of LLMs in education. arXiv preprint, 2023.
9. Farrokhnia M, Noroozi O, Wals AEJ. SWOT of ChatGPT in education. Innov. Educ. Teach. Int, 2024.
10. Acosta-Enriquez BG. *et al*. Knowledge & ethics of ChatGPT among Gen Z students. Int. J. Educ. Integr, 2024.
11. Ouyang F, Wu M, Zheng L. AI performance prediction & learning analytics. Int. J. Educ. Technol. High. Educ, 2023.
12. Review on ChatGPT strategies in higher education. J. Digital Educ. Technol, 2024.