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IMPACTS OF CHATGPT IN EDUCATION FROM A STUDENT'S PERSPECTIVE

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Abstract -The introduction of technologies such as AI, chat bots, robots, ChatGPT, etc. represents a significant advancement in the field of computer science. The underlying technology i.e., AI and ML are key to further innovations as well as numerous challenges. They are expected to impact every aspect of society including education. For example, a study suggests that ChatGPT is able to help researchers write a paper that is coherent, accurate, informative, and systematic with very limited professional knowledge from the author. While on one hand ChatGPT is doing wonders, on the other hand it raises concern for students outsourcing their assessment tasks, thus hindering their own growth by destroying the basic purpose of education, that is, to improve students' creativity and critical thinking by engaging them in solving real-world problems. The position paper shall discuss the effect of ChatGPT in the field of education from a student's perspective. AI is a powerful tool that students should know how to use.

Key Words: ChatGPT, Artificial Intelligence (AI), Education system, Student's perspective

1. INTRODUCTION

1.1 What is ChatGPT?

The definition of ChatGPT from ChatGPT itself says that it is an artificial intelligence (AI) language model developed by OpenAI. One of its key features is that it's based on the Generative Pre-trained Transformer architecture, a type of large language model (LLM), specifically GPT-3.5. GPT-3.5 is one of the most advanced versions of the GPT series which has been trained on a massive amount of text data from the internet and can generate human-like responses to text prompts. It also states that ChatGPT is designed for conversational tasks, enabling users to have interactive and dynamic conversations with the model.

1.2 Artificial Intelligence and how it works

Artificial intelligence (AI) refers to the field of computer science that focuses on creating intelligent machines which should be capable of performing tasks that would typically require human intelligence. Specific applications of AI include expert systems, natural language processing, speech recognition and machine vision.

AI systems work by processing large amounts of data and using algorithms to extract patterns, make predictions, or perform specific tasks. Some of the steps it follows are - Data Collection, data preprocessing, model training, feature extraction and selection, model evaluation and optimization and deployment and Inference. AI systems for its working require substantial amounts of data to learn to make predictions which can be in the form such as text, images, audio, sensor readings, or any other relevant input depending on the task, called as raw data. Raw data is then cleaned, formatted, and transformed into a suitable representation for the AI model. AI models are trained on labeled or unlabeled data using various techniques, with machine learning being a common approach. During training, AI models learn to extract relevant features from the input data that are essential for making accurate predictions or performing the desired task. After training, the AI model is evaluated using validation data to measure its performance and identify areas for improvement. Various metrics, such as accuracy, precision, recall, or loss, are used to assess the model's effectiveness. Once the model is trained and deemed satisfactory, it can be deployed to perform real-world tasks.

2. LITERATURE REVIEW

The various paper studies states unitedly that ChatGPT has become a megatrend which is expected for sure to continue as the 21st century progresses. GPT-3, which is a Large language model, has made significant advancements in natural language processing (NLP) in recent years and has swept the NLP community. These models are trained on massive amounts of text data and are able to generate human-like text, answer questions,

and complete other language-related tasks with high accuracy.

An important development in GPT is the use of pre-training. In this, a model is first trained on a large dataset before being fine-tuned on a specific task. This has proven to be an effective technique for improving performance on a wide range of language tasks. For example, BERT is a pre-trained transformer-based encoder model that can be fine-tuned on various NLP tasks, such as sentence classification, question answering and named entity recognition.

Recent advancements also include GPT-3 and ChatGPT, which were trained on a much larger datasets, i.e., texts from a very large web corpus, and have demonstrated state-of-the-art performance on a wide range of natural-language tasks ranging from translation to question answering, writing coherent essays, and computer programs. Extensive research has also been conducted on fine-tuning these models on smaller datasets and applying transfer learning to new problems. This allows for improved performance on specific tasks with smaller amounts of data.

It comes with a lot of opportunities for a student according to a paper published by ResearchGate. For elementary school students, large language models can assist in the development of reading and writing skills (e.g., by suggesting syntactic and grammatical corrections), as well as in the development of writing style and critical thinking skills. These models can be used to generate questions and prompts that encourage students to think critically about what they are reading and writing, and to analyse and interpret the information presented to them. For middle and high school students, large language models can assist in the learning of a language and of writing styles for various subjects and topics, e.g., mathematics, physics, language and literature, and other subjects. These models can be used to generate practice problems and quizzes, which can help students to better understand, contextualise and retain the material they are learning. And, for university students, large language models can assist in the research and writing tasks, as well as in the development of critical thinking and problem-solving skills. These models can be used to generate summaries and outlines of texts, which can help students to quickly understand the main points of a text and to organise their thoughts for writing.

With opportunities also comes challenges. Key Challenges and Risks Related to the Application of Large Language Models in Education include copyright issues, heavy dependent of learners on the model, lack of understanding and expertise, difficulty to distinguish model-generated from student–generated answers, difficulty to distinguish between real knowledge and convincingly written but unverified model output and much more. Some research works also claim that ChatGPT has limited context, lack of emotions and empathy, inability to interpret nonverbal cues and inability to perform physical tasks.

From multiple papers read, we can understand about the advancement in the technology for the success of ChatGPT in the present world. It holds multiple applications in fields other than education such as Healthcare sector, Journalism and Misinformation Detection, Software Development, Scientific Research, etc.

3. METHODOLOGY

This research was performed by following some guidelines given below

3.1 Identifying the purpose and the research questions for the review.

Knowing the question/purpose of the research/thesis paper helps making informed decisions about which resources to select and study. Based on the purpose of the study, following questions were raised:-

3.1.1 What are the probable effects of ChatGPT to students if brought in to Educational field?
3.1.2 What are the advantages students can get through the use of ChatGPT?
3.1.3 What are the limitations of ChatGPT for students should be aware of?

3.2 Describing the methods of data collection.

Data collection is the process of gathering information from a source, which readers need to know. Looking through the problem statement of the paper, the type of data selected is Qualitative data. Data has been collected from various resources such as from articles of relevant publishers, already published research papers, available interviews, and other online available knowledge. Some of them are:-

Articles

3.2.1 *What Is ChatGPT? What to Know About the AI Chatbot* - written by Karen Hao, published by The Wall Street Journal in May 2023

3.2.2 *What is ChatGPT? How AI is transforming multiple industries* - published by Forbes Money in February 2023.

Other Research Papers

3.2.3 ChatGPT for Good? On Opportunities and Challenges of Large Language Models for Education - written by Enkelejda Kasneci, Kathrin Seßler, Stefan Kuechemann and Stefan Kuechemann and published by ResearchGate

3.2.4 Open AI in Education, the Responsible and Ethical Use of ChatGPT Towards Lifelong Learning - written by David Mhlanga

Note that many more resources are taken into account for the study.

3.3 Describing the methods of data analysis.

There exist many methods to analyze data which is qualitative in nature. Some of the Data analysis methods for qualitative data are – Content analysis, Narrative analysis, Discourse analysis, interpretive phenomenological analysis, etc. Looking at the problem statement of the paper and the data collected from various relevant resources, Content analysis is supposed to be the correct analysis method for the given statement. After data analysis, all the effects of chatGPT in education system, be it in positive manner or in negative manner, became clearer.

3.4 Evaluation/justification of the research analysis.

Our methodology shows the approach we chose for our research work. This section discusses why other methods were not used and only the chosen method was used. Content analysis is the most commonly used method. It is a research tool which is used to determine the concepts, ideas, hidden meanings or phrases within some qualitative data. Since the articles, interviews, books etc., cannot be altered, content analysis is the best for this research work.

4. POSITIVE IMPACTS OF CHATGPT INEDUCATION SYSTEM

4.1 Content availability - Since ChatGPT has been trained with a huge dataset, it provides a readily available source of information and guidance, making it easier for students to access information, knowledge and support when needed, regardless of time or location. ChatGPT has content related to almost every topic. It helps students to do their assignments and home works about specific topics or concepts they are struggling with, and the AI can provide explanations, examples, or resources to help clarify their understanding. Content availability also helps in concept reinforcement as ChatGPT can provide additional examples, analogies, and explanations to reinforce students' understanding of complex concepts or topics they are studying.

4.2 Ease in Research work - ChatGPT can help immensely in research work as the model can perform data analysis, data mining and research collaboration from large datasets far better than human computation. The model can analyze large volumes of data from various sources to identify patterns, trends, and correlations that are not easily visible to human researchers and also can help researchers extract relevant information from large volumes of unstructured text data such as research papers, news articles, and social media posts to get a summarized and detailed knowledge. Also, ChatGPT works great as a plagiarism detection tool. When ChatGPT is asked about a writing if it is generated originally, it performs better than other plagiarism softwares and tools. Along with data analysis, text mining and plagiarism detection, ChatGPT also does grammar and writing checks, which is also an essential element of preparing a research work to improve its quality and reliability.

4.3 Personalized guidance - ChatGPT can adapt itself according to the student's understandability and level. It appears as if some intellectual human is talking to a student and making him understand the concepts in a friendly manner. Thus, it can help create tailored learning experiences for students based on their individual needs, interests, and skill levels, allowing for more targeted instruction resulting in improved learning outcomes. Students can thus be benefitted by building their confidence in their abilities. This can lead to better academic performance and a more positive attitude toward learning.

5. NEGATIVE IMPACTS OF CHATGPT IN EDUCATION SYSTEM

5.1 Limit to creativity - A potential disadvantage of using ChatGPT as a student is how it could limit their creativity by offering them instant solutions and preventing them from brainstorming. Though it helps students in completing their assignments and homeworks, it also becomes a source of outsourcing assignments by students, which results in hindering their growth in critical thinking ability.

5.2 Lack of human interaction and expertise - While ChatGPT can hold a conversation and provide information, it lacks the ability to provide personalized feedback or have a real-time conversation with a student. This can limit the learning experience and make it difficult for students to fully understand a concept or ask for clarification. This also leads to the concern of dependency on technology. ChatGPT relies on

technology to function, which means it may not always be available or may experience technical difficulties to cause frustration to students trying to learn. Since its dependency on technology, it is only as knowledgeable as the information it has been trained on. It may not have access to the most up-to-date information to provide a comprehensive understanding of a topic. Students can't totally rely on it.

6. CONCLUSIONS

ChatGPT is a Large language model which has made significant advancements in natural language processing (NLP), developed by OpenAI and is now a megatrend which is expected to expand continuously in this century. The use of large language models in education is a promising area of research that offers many opportunities to enhance the learning experience for students. We saw the positive impact of ChatGPT in a student's life such as content availability, ease in research work and personalised guidance and mentorship. However, to unleash its full potential in education, it is crucial to approach its use with caution and to critically evaluate their limitations such as limit to creativity, lack of human expertise and interaction and much more. ChatGPT is a new AI technology that has got enormous success on its initial days of release. Despite having some challenges, it is a useful tool for a student providing he/she should know how to use it.

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