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Review: ChatGPT Impact on Indian Education Sector and Correctness in Answers

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Abstract

This article is all about the ChatGPT. As AI is one of the emerging technologies in the current era. The application of AI "ChatGPT" is mainly focused in this study. This study concentrates on the technology behind ChatGPT, its advantages, limitations, and discussions on current trending applications of AI called ChatGPT. Considering AI technology, the article will provide the glimpse of the learning technologies, Generative Pre-Trained Transformer (Particularly GPT-3 and GPT-2), and also discuss how many education institutions are using AI. By method of data collection some conclusions could be drawn on ChatGPT users and user interaction experiences. In addition, what is ChatGPT, the purpose of ChatGPT, why it has gained extensive popularity and attention, methods of training ChatGPT along with Large Language Models, how ChatGPT makes use of GPT-3 and RLHF (Reinforcement Learning form Human Feedback), advantages and limitations of ChatGPT are also comprehended.

Keywords: ChatGPT, AI, User Experience, Generative Pre-Trained Transformer; Large Language Models; RLHF

1. Introduction

Nowadays, the advancement in technology is increasing rapidly. Google has been used as a search engine for more than 20 years. It allows us to search for the required information and scroll through many options, i.e., websites, and select any. However, the information on

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the web is private and can be right or wrong, and you need to spend a lot of time to get the right information and verify. This leads to the need for a technology that instantly gives us the perfect answer without skimming through the web. The answer also must be appropriate and verified. Hence, the rise of ChatGPT was seen as primarily made for this purpose of finding answers or keys in a short-limited time.

Digital literacy needs a "self-learning" profile which should be defined by a strong desire to study, a capacity to identify and how to utilize digital materials efficiently for career development. As a result, self-learners' increased ability to adapt to the rapid growth of the digital technological world, organizations/firms are increasingly seeking employees who possess these attributes of self-learning [1]. With the increasing availability of open educational resources and other educational practices, obtaining high-quality learning resources and materials is becoming easier for everyone. This has made education more affordable, accessible, and ease of use[2].

In this context, ChatGPT, a recent AI development from Open AI, improves self-learning for several reasons. It can also offer recommendations for the future of education and the use of technology in the classroom. It might pinpoint the best methods and techniques for using chatbots and other artificial intelligence (AI) tools in the classroom. When educators and students understand how ChatGPT may encourage the freedom and independent study of self-learning, they can use these technologies to improve and enhance their own learning and development more effectively.

2. Models of ChatGPT

ChatGPT extensively uses AI, LLMs, GPT (Generative Pre-trained Transformer), and many more programming languages [3]. We will discuss each of the points mentioned above and other features in the following sections.

2.1 ChatGPT: Large Language Model

ChatGPT is trained with tremendous effort. LLM, or Large Language Model, is a deep learning algorithm that can predict, generate, recognize and summarize text and other content based on the knowledge gained from massive data sets (Here comes the role of GPT). In simple words, LLM teaches AI the “HUMAN LANGUAGE.” However, for LLM to function, vast

blocks of data (data sets) are required; GPT fulfills this requirement GPT, as already mentioned, stands for Generative Pre-trained Transformer [4]. It is used to hold data sets of knowledge required by ChatGPT to reply or give an answer. A human cannot answer a question without knowing the answer; the same applies to ChatGPT. This explains the importance of GPT; the newer version of GPT – namely GPT-3 – is the primary reason for the considerable success and exponentially increasing popularity of ChatGPT worldwide. GPT-3 is trained with 570GB of text and 175 billion parameters. GPT-3 is, comparatively, 100 times bigger and better than GPT-2(the predecessor of GPT-3) [5].

One of the most significant changes that made an impact apart from GPT-3 is the RLHF training, elaborated as "Reinforced Learning with Human Feedback." It enables the chatbot to improve based on feedback provided by the users. RLHF is a breakthrough involving a lot of programming and machine learning technologies. Not only feedback but also online discussions are used to improve.

An example of reinforced learning from human feedback from online discussions- It is known that elephants do not lay eggs, but ChatGPT failed to provide a correct answer. However, it was later fixed, and now, this answer does not occur again.

Finally, ChatGPT incorporates all the features required to behave as a human-like chatbot. It is a very comprehensive tool with many advantages. Most importantly, it can understand the intent of the question. However, anything that comes to us has certain limitations.

2.2 ChatGPT: AI Domain and GPT Overview

OpenAI first implemented ChatGPT on its website. However, with the increase in profits and collaboration with other companies, they have driven to spend millions of dollars on a single domain. They bought the domain in 2021, developed it over time, and implemented it recently. The approximate price of the domain is unknown, but it is estimated to be around 10 million or 11 million dollars [4]. The primary company that has been supporting OpenAI is Microsoft. With this move, OpenAI and Microsoft went a step further than Bard – the most significant competitor to ChatGPT – by Google [3].

GPT: GPT stands for “Generative Pre-Trained Transformer”. There are three versions of GPT: one, two and three (GPT-1, GPT-2 and GPT-3, respectively). The fourth version is currently in development (GPT-4). Generative Pre-Trained Transformer means it is already trained with vast blocks of text (around 570GB) and complex algorithms to generate responses as humans do. They incorporated the text from a publicly available dataset called “CommonCrawl” and Wikipedia. GPT-3 was found to be one of the most revolutionary technologies in the past 15-20 years [5].

3. Objective of ChatGPT

Since most of the self-learners are using google search engine for all kinds of tasks/queries. However, nowadays, this process has become time taking as never before. Due to the vast information and insanely high number of websites from which you can get the answer to your query, it has become a long process to go through each website and find the most appropriate answer that you need. Hence, self-learners find an alternative to google search that is much faster and easier to use. Looking at this situation, the main objective of ChatGPT is human computer interaction via a dialog box, in which learner/user can ask any type question they are looking for and without any delay ChatGPT can provide user requested answers. The open AI has taken a decision to make a powerful tool which will be useful and more reliable than google. Even though answers are completely verified by Google, open AI application chatGPT must provide data that has been verified. It is very difficult to make such a powerful tool that would transform the entire technology itself and the way we interact with the devices. ChatGPT is intelligent and does much more than simply respond to straightforward queries. Using its vast data warehouses and effective design, it can also satisfy complex demands[6]

4. ChatGPT Language Model in Education Sector

Since ChatGPT is a language model we can use the ChatGPT in various ways especially in the education sector which will have a high impact on search or finding the correct answers for the learners[7].

Language Learning: This model will give assistance to the language learners individualized feedback, practice materials, and conversation simulations. This open AI language model can aid them become more fluent in their target language.

Creation of content: Model can help to create instructional materials like group discussion, quizzes and course guidelines and other lecture material that are tailored to each student's needs in the class.

Academic Analyses: Analyzing the information for various purposes like research or project work, open AI models can produce summaries, insights of data and suggestions that can assist learner/user in making innovative findings and perception.

Individual Tutoring: ChatGPT can act as a virtual tutor, providing personalized help to students. It can answer questions, explain concepts, and assist with homework or assignments. Its availability 24/7 makes it a valuable resource for students who need help outside of regular classroom hours.

5. Application of ChatGPT in Education Sector

In this section we discuss and highlight a range of applications of ChatGPT: Ability to mutate industries into digital organizations/firms. As technology grows, AI has a lot of impact on various fields such as education, engineering, customer service and health care [8]. In this paper we will emphasize only the education sector. Natural language processing has been used to develop the AI based human Interactive bots, which can understand the users/learners query and interpret in understandable language[9]. With increasing preference towards instant and one-to-one communication through crisp messages, these Human Interactive Bots have become more popular because of their quick and efficient responses[10].

Coaching Support: One more advantage of ChatGPT is in the education sector. It can be used by teachers for making the classroom more interesting. ChatGPT can give suggestions related to lesson plans, lecture notes and class activities and practices[11].

Examination Preparation: Students need to prepare for examinations, which most students find difficult. One must surf through the web in order to find appropriate and valuable sources for test preparation. However, with the use of ChatGPT, this can be avoided as

ChatGPT will itself give all the recommendations for examination attempting strategies, subject resources, and sample tests. Apart from providing this valuable information, it can also calculate and give recommendations based on your past exam scores[12].

Evaluations support: This model has advantages for the instructor/teacher to make evaluation and rubrics for the question papers. This is very beneficial for the educator section.

Programming Enhancing: ChatGPT can analyze programming code such as algorithms and data organization and enhance your code based on that analysis done. It will enhance your code by pointing out the improvements that can be made and also make your code more structured and optimized[13].

Code review: Another perspective of ChatGPT, It can be used to aid review of code by testing code on the programming. By figuring the strong and impending issues and providing instructions/proposing the recommendations for better improvements, This can help the software engineers/ software coders will get morehelp and productivity and quality of work will improve [14].

6. Limitations of ChatGPT

Even though there are many advantages with ChatGPT, there is another perspective of ChatGPT: The drawbacks, are discussed below clearly with practical considerations.

Toxic Responses: Sometimes, the response given by ChatGPT can be toxic, i.e., it can appeal to a certain individual based on bias such as religion, caste, financial status and many more. For example, one can prompt ChatGPT to say nasty person, bad person, horrible person and make it sexist or racist as well. The capabilities of ChatGPT are immense; however, the disadvantages include harmful and toxic responses [15,16]]. Later, the great improvisation in the technology and adding more security to GPT-4 has greatly reduced the toxicity to almost negligible.

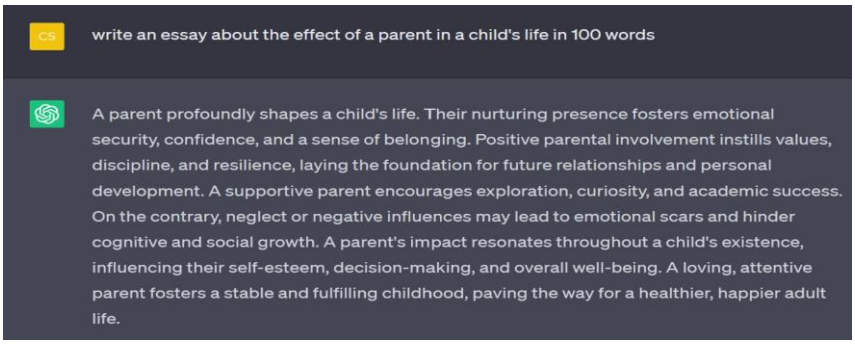

Figure 1. Toxic Response by ChatGPT

Quality of Answers: The quality of answers given by ChatGPT is a major issue because it is dependent on the question. More detailed the question, more detailed the answer. For example, a question that asks ChatGPT to write an essay about a parent's role in one's life in 100 words can be phrased in 2 ways and the answer depends on the preciseness of the question.

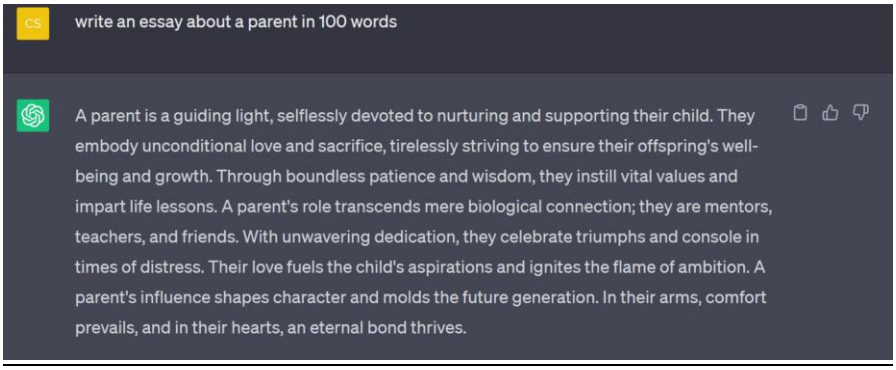

Figure 2. Quality of Answer

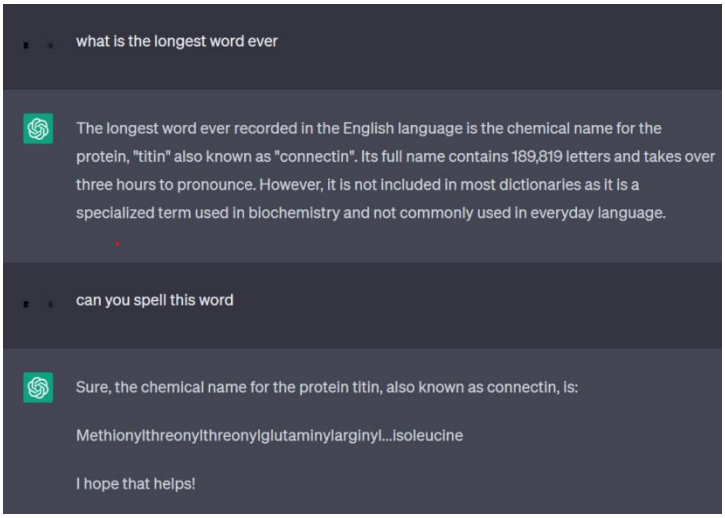

Figure 3. Quality of Answers

Incorrect Answers : Sometimes, due to the data restriction, ChatGPT will not be able to find the answer to the question and ends up giving the wrong answer. For example, when ChatGPT was asked to name a country that starts with the letter “V”, it answers that there is no country that starts with “V”. If it is asked to confirm its answer, it also confirms it. This is a major issue.

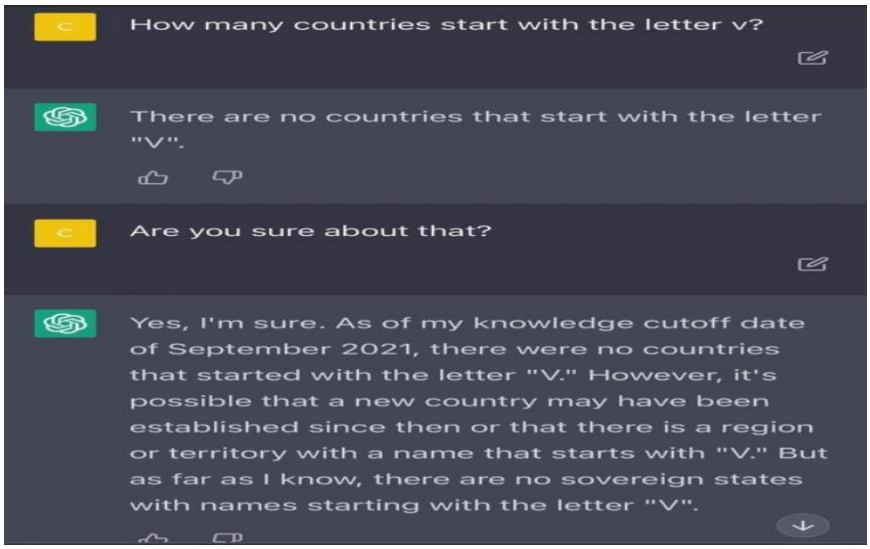

Figure 4. Incorrect Answers

ChatGPT Plus: At the beginning, ChatGPT claimed that ChatGPT will be free and open-source. However, they later made it commercial by OpenAI. We can still access ChatGPT that uses GPT3.5 but cannot access ChatGPT with GPT 5. It has also partnered with Microsoft for funding about 10 billion dollars.

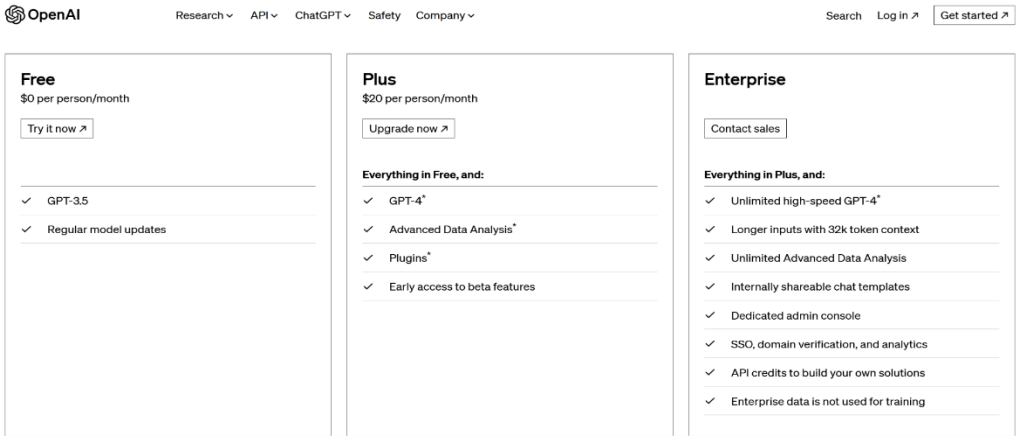

Figure 5. ChatGPT Plus “Subscription

7. Results

As per our review, the population size we targeted 400 and we have received 365 responses from an estimated 400 participants (response rate 91%). Having that said, the general evaluation of this survey has been that 71.7% of the audience have tried ChatGPT. As per the interview and survey results has clearly shown that users/learners are much more fascinated towards ChatGPT in using it in a broad range of activities.

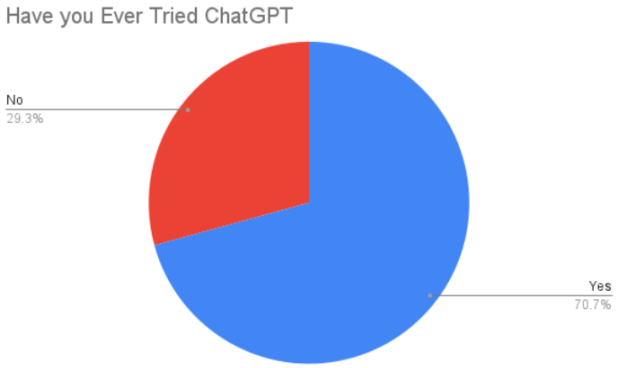

Figure 6. Analysis on usage of ChatGPT

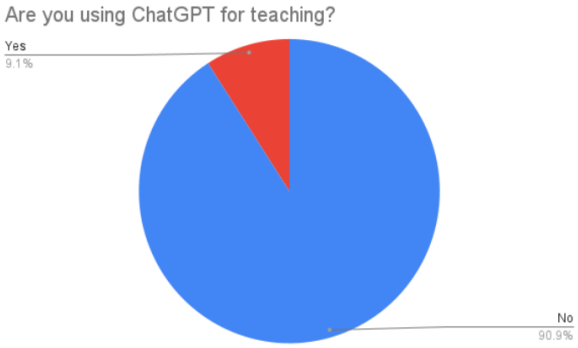

Figure 7. Analysis on usage of ChatGPT by Teachers

In the questionnaire we have mentioned “which search engine you recommend” on the scale of 1- 5. Surprisingly, we have received 57.8 % would like to recommend the tool for learning and gaining knowledge

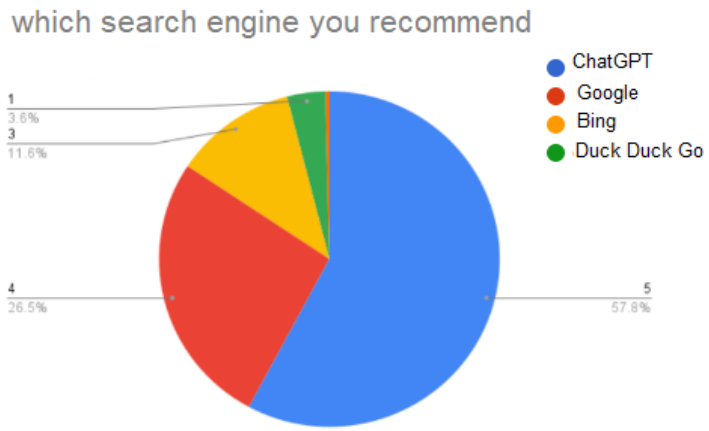

Figure 8. Recommendation Rate of Search Engines

8. Conclusion

There are many ways for the users to explore and gain knowledge with the OpenAI tool: ChatGPT, especially in the education sector. However, there are many unpredictable challenges involved with the tool such as toxic responses, incorrect answers and quality of answers, as discussed in the above section. This advanced technology has made a huge difference in the world especially in the educational sector. The new innovation by OpenAI is creating a groundbreaking outcome, for users/learners. ChatGPT is already incorporated into classrooms and is becoming beneficial for the education system; however, student learning must have quality answers in a lot of scenarios. As per the analysis on usage of ChatGPT it is seen that the popularity of ChatGPT is increasing exponentially because of its leverage. Both teachers and students make extensive use of ChatGPT in the educational sector.

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