A Descriptive Study Of The Generative Artificial Intelligence Applications In Context Of Their Potential And Impact On Humans Cognitive Behavior

Dr.Dharam Pal Singh
Assistant Professor
University Institute of Computing,
Chandigarh University, Gharuan, Mohali, Punjab, India

Abstract- *Modern day computing is heavily influenced by the applications of Artificial Intelligence in terms of providing solution to the complex problems in a fast and reliable manner. Presently a number of the Generative AI applications have been designed and developed by different organizations that are kept open for the general public to use to solve their problems. These problems could range from the academic domain to the professional domains. People seek solution to the problems from the generative AI tools by providing instructions to these tools and in return receive the solutions in terms of the instructions. ChatGPT, a well-known AI tool, is the prime generative AI tool which has got world- wide recognition in a very short span of time, after its launching. The present paper makes an attempt to cover the present-day Generative AI tools, the potential of these AI Tools and their impact on the thinking process of the humans, especially the students, who are supposed to find solution to their problem by applying their own mind, in place of using assistant like a generative AI tool that thinks for the students on their problems. This also have various effects on the cognitive behaviour of the individuals, specifically students, who are required to inculcate the habit of learning, through solving the problems by applying their own mind and logical reasoning, rather than there is someone, who is providing the solution for these individuals on variety of academic problems. The present paper discusses the generative AI applications, their potential in problem solving and their effect on the cognitive behaviour of the learning minds.*

Keywords- Artificial Intelligence (AI), Chatgpt, Cognitive Behaviour,Generative AI, Hallucination.

I. INTRODUCTION

The major breakthrough in the journey of harnessing the potential of AI begun in the year 2022 with the launch of the generative AI application, commonly known as ChatGPT[1].The ChatGPT is a dialogue based Artificial Intelligent Chatbot, an AI Chatbot that interacts with the humans using the natural language. It was developed by the Open AI Foundation, which is an Artificial Intelligence research organization established in America [2]. The Generative AI tool is a pretrained application, which is capable of involving in conversations with humans through text-based computer interface. ChatGPT is based on the large language model and is trained by Supervised Learning and Reinforcement Learning to generate text which is understandable by the humans. The generative AI applications are trained by the data available on Internet. ChatGPT can be used to perform variety of tasks in few seconds to cater to the needs of the individuals belonging to different fields of professions and fields. It is not limited to be used in the academics and by students and educators, however, all the fields of human endeavors are benefitted with the applications of the generative AI tools [3,4, 5]. All over the world, around three hundred million users were using ChatGPT, the generative AI tool, as of December, 2024 [6]. The following graph depicts the number of the users worldwide, who are using ChatGPT.
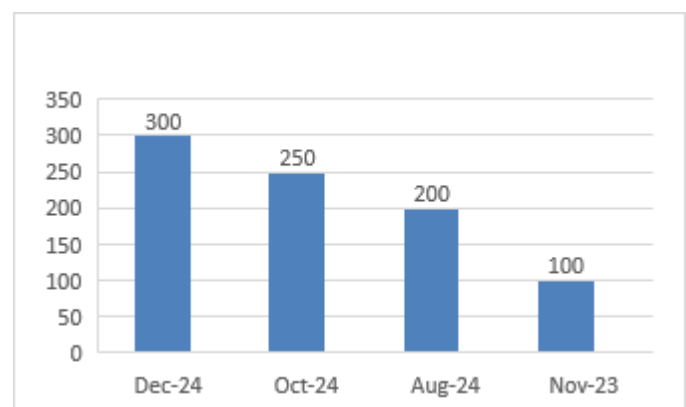

Figure 1. No. of Users of ChatGPT (Numbers in Millions) [6]

II. RESEARCH METHODOLOGY

Research methodology employed in research, shapes the outcome of the research[7]. In order to conduct the present research, descriptive approach of research is followed. The data is collected from both the secondary sources as well as the primary sources. The data from research papers, reports, news items and different websites is studied as a secondary

source of data. The behavior of different individuals, specifically the professional individuals, researchers and the students are studied as the primary source of data.

III. DISCUSSION ON GENERATIVE AI TOOLS

Similar to the development of ChatGPT, a number of generative AI applications are developed by several other organizations [8]. Each of these generative AI applications, are designed to accomplish a particular task, such as providing text-based reply, to work with images and to create PowerPoint presentations, to provide code for problems and much more. The following table, Table I contains a list of the generative AI tools that are developed by different organizations and are currently in use by the general public as well as professionals all over the world.

Name of the Generative AI Applications	Year of Launch
Dall-E 2	April, 2022 [9, 10]
ChatGPT	November, 2022[11]
Claude AI	March 2023 [12]
Gemini	June 2024 [13]
Meta AI	September 2023, and it was launched in India in June, 2024 [14]

Table 1. List of Different Generative AI Applications.

The generative AI Models have eased the life of the humans, in the sense that these tools interact with the humans in a way, humans do. These chatbots are quite fast in imagining and creating images, in analyzing the large documents, to bring about a new idea to work with, to do mathematics and coding. A generative AI application is capable of writing unique content, in only few seconds[15]. The generative AI tools have helped the masses all over the globe, with the capabilities of the large language models, however, it does suffer with unescapable problems such as its ill effects on the learning minds i.e. students and the problem of hallucination that corresponds to the non- realistic and inaccurate results given by the generative AI applications [16,17,18].The following graph captures the age-wise percentage of the users of the ChatGPT in the year 2024.
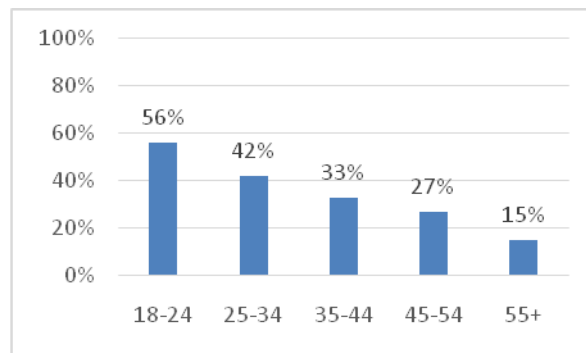

Figure 2. No. of Users of ChatGPT by Age- Group wise in the year 2024. [19]

IV. EFFECT OF GENERATIVE AI TOOLS ON THE COGNITIVE BEHAVIOR OF THE RESEARCHERS AND STUDENTS

The graphical representation in Figure 2 shows that majority of the users belong to the age group that belongs to the age group of the students. A generative AI application, when used by the professional individuals to solve the problems, to which their organization deals, the major concern which is of utmost importance is about the correctness of the solution provided by the generative AI tools, whereas, less heeds are paid to the learning aspect by the professional individuals. On the other hand, the use of a generative AI tool such as ChatGPT by the researchers and students to solve their academic problems, makes them forget about the importance of the process of critical thinking and learning. Learning and critical thinking plays a very major role in the success of the students in every facet of life. The potentials of ChatGPT have affected the abilities of the students to keep information in their memory i.e. memory retention and they have become entirely dependent on the generative AI Tools [20,21].

V. CONCLUSION

ChatGPT has many potential benefits to employ as a learning tool for the learning minds, i.e. students. It is also equally helpful for the individuals from the professional world. However, relying entirely on ChatGPT to find solution for every academic problem, by the students has many ill effects, such as reduced level of critical thinking, reduced level of memory retention. A future work can be conducted by employing the experimental research to identify the risks associated with the extensive use of a generative AI toll by the individuals, to find solution to every academic and professional problems, rather than applying own mind and logical reasoning. A further work can also be carried out on hallucination, the major problem associated with the generative AI tools.

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