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**DEAR CHAT GPT, AM I STILL THE RESEARCHER? RETHINKING
PRODUCTIVITY IN THE AI ERA**

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Abstract

OpenAI created ChatGPT and launched it in November 2022. After its launch, it gained popularity quite quickly. It has changed researchers' ways of working with data to generate ideas. ChatGPT is used at several stages of the researcher's work, including new idea formulation, literature review, hypothesis formulation, and paper preparation. ChatGPT has made it possible to support researchers in their work in innovative ways. The paper examines ChatGPT's advantages and disadvantages to offer academics and institutions advice on maximizing its advantages while minimizing its drawbacks. The outcomes may help build regulations and guidelines for researchers' ethical usage in their fields of study.

Keywords: ChatGPT, AI language, Generative Pre-trained Transformer, Productivity, Chatbot, GPT-3 model, Machine Learning.



Introduction:

In the era of artificial intelligence (AI), ChatGPT was introduced by the American corporation OpenAI (Kirmani, 2022). It is an adaptation of the GPT-3 model (Brown et al., 2020) and assists in producing text that is naturally similar to people's dialogue (Floridi et al., 2023). The language model used in ChatGPT (Generative Pre-trained Transformer) is an example of AI. Moreover, the language model is AI-powered and has been developed using vast quantities of data to produce human-like text (Cooper, 2023). Chatbots that can interact with users and respond to questions have been created using GPT-3 capacity to understand inputs in natural language (Cotton et al., 2023). It allows students to raise questions and hold discussions whenever it suits them; they do not need to be available. Moreover, it has the potential to compose reports, write emails, and do other forms of professional writing. It has been demonstrated to increase student involvement (Li & Xing, 2021). Hence, ChatGPT could appear to be a useful tool for improving writing abilities. Its capabilities, including text generation, summarization, and outlining, offer the potential to save time and elevate the level of academic writing (Atlas, 2023). By leveraging the features of ChatGPT, researchers can benefit from generating relevant and well-structured content, summarizing information efficiently, and creating comprehensive outlines. It can be used in several ways, one of which is as an online tutor to assist students in enhancing their productivity (Dwivedi et al., 2023). Moreover, it can produce acceptable-quality paragraphs and college-level papers for the researcher. Undoubtedly, it has several benefits as well as some challenges. Some believe that as ChatGPT learns and grows more intelligently, authors and poets will become irrelevant (McGee et al., 2023). If researchers depend on ChatGPT too much, such as writing their articles, literature reviews, and theses, it will harm their productivity and logical thinking. Moreover, ChatGPT is used to write whole research papers or articles, it would probably be considered a breach of academic integrity (Stokel-Walker, 2022). It often writes plausible-sounding but incorrect or absurd responses (Opara et al., 2023). Because ChatGPT lacks a definite moral viewpoint, users should not follow its recommendations wholly (Krugel et al., 2023). Research is about discovering something new based on existing or available knowledge, but if ChatGPT does the majority of the writing, researchers may not exercise their critical thinking and creativity. It could ultimately lead to a decrease in the quality and originality of research.

ChatGPT can help generate hypotheses, writing objectives, research methodology, and conclusions, but it may hinder researchers' ability to read and analyze various articles, potentially reducing their overall productivity. It may be alluring for students to use ChatGPT to produce assignment submissions, but doing so will not advance their academic or professional growth or learning (AIAfnan et al., 2023). Using it could impact their decision-making because users could generate automated responses using the application (Cowen, 2022). The study aims to: i) analyze the literature on the usage of AI language models in academic studies. ii) to determine whether employing ChatGPT could be advantageous; iii) to explore the limitations and challenges of using ChatGPT. The data were collected from secondary sources for the study, including articles, journals, websites, ChatGPT, etc. Although it has many advantages for academics, it also has several drawbacks, such as the possibility of errors and biases, the need for human monitoring and editing, and privacy and security issues. ChatGPT has the potential to revolutionize the research process by improving the efficiency and accuracy of the researcher.

Literature Review:

The concept of ChatGPT is relatively new, but it has quickly gained immense popularity among researchers and students. While an enormous quantity of research is being carried out in the education field with the aid of ChatGPT, there is comparatively less emphasis on exploring its potential for researchers themselves. The use of ChatGPT by researchers has become a prominent and trending topic in 2023. Moreover, it has grown increasingly popular in the academic field in recent years, which has increased the prevalence of machine learning (ML) and artificial intelligence (AI). It was launched in November 2022, created with human feedback (Qadir, 2023), and is open source free of charge. It has attracted millions of people since its launch. When asked a question, ChatGPT will produce an answer based on thousands of online resources, frequently without the user's further participation (Liebreinz et al., 2023). Crawford (2023) discussed the good and bad of AI ChatGPT; he had mixed feelings about ChatGPT. Students under academic stress are more likely to use AI to accomplish work, and AI technology may be a tool for certain students to deal with pressure. He showed concern about plagiarism, authentication, and academic integrity in the research. Moreover, researchers and individuals

have successfully employed ChatGPT and similar large language models for a variety of tasks, such as generating essays and speeches, condensing and summarizing literature, creating initial draft of papers, enhancing the quality of existing papers, pinpointing research gaps, and even producing computer code, including statistical analyses (Dis et al., 2023). But it still possesses certain limitations, such as the absence of common sense, the potential for bias, difficulties in handling complex reasoning, and the inability to process visual information. It is important to remain aware of these limitations and avoid relying entirely on ChatGPT (Rahman et al., 2023). Thorp (2023) said that using ChatGPT can be fun, but it has a negative impact on the education sector. While ChatGPT can produce articles on a variety of topics, its academic writing is still evolving, and it was emphasized that there are considerable worries about how it would make changes in education. He argued that ChatGPT and other AI tools have the capacity to handicap academic integrity as well as being capable of bringing about a revolution in academia. He said it's human responsibility to reduce risk and plagiarism for good research (Eke, 2023). Despite these drawbacks, ChatGPT continues to be an effective tool for students who want to produce high-caliber review papers. Furthermore, they can produce thorough and perceptive assessments that summarize the most recent developments in their field by carefully adding pertinent keywords and data. Instead of spending hours reading through the literature and manually creating summaries, researchers may concentrate on analyzing and interpreting the findings of their literature reviews with the help of ChatGPT. It has generated enthusiasm and controversy, both due to its ability to engage in meaningful conversations with users in various languages, including English. Notably, it remains accessible at no cost, is user-friendly, and continually enhances its learning capabilities (Huang & Shih 2009). AI and chatbots possess a neutral nature, lacking inherent moral qualities. However, it is crucial to acknowledge their susceptibility to misuse, particularly within higher education. Although these technologies offer the potential to enrich our lives and enhance numerous industries (King et al., 2023), According to the authors, ChatGPT might benefit the researcher significantly if used intelligently and ethically. This artificial intelligence technology could assist researchers at all phases of their work, including concept generation, results analysis, paper setup, journal selection, and editor recommendation (Xames

et al., 2023). ChatGPT is a helpful resource for sharing knowledge and responding to inquiries on various subjects (Biswas et al., 2023). Some authors argued that students must permit and encourage its use. It is capable of solving technical as well as nontechnical problems, and it's important to recognise that it has incredible powers to generate responses. It assists students in creating new ideas and skills by giving information and content on the specific topic and providing new research topics. Additionally, ChatGPT may assist students in creating research skills by giving them material and resources on a specific topic, providing new perspectives, and connecting them to innovative studies, giving them permission to gain more insight on the topic (Kasneci et al., 2023). According to Roose (2022), ChatGPT is the most advanced AI chatbot ever made available to the public. If we talk about the benefits of ChatGPT, it has huge uses, such as summarizing long papers, writing a manuscript, and making a presentation draft. It assists students, researchers, and teachers in developing new ideas about the research and also helps in writing essays (Zielinski et al., 2023). Firat et al. (2023) discussed how AI would affect traditional learning methods; it would divert the focus from current learning techniques, shifting it towards abilities and skills and shaping the responsibilities of educational institutions. Halaweh showed confidence in the future of AI in education despite acknowledging the difficulties and potential problems that may emerge during the process. Some authors have explored the benefits of ChatGPT, and some have criticized its use in the education area. No doubt, its emergence and growth have brought about rapid transformation in the education sector (Halaweh et al., 2023). It has become a well-liked tool for gaining quick answers to a variety of questions, from common to complex themes, thanks to its capacity to interpret natural language queries and produce human-like responses.

Objectives:

1. To analyze the literature on the usage of AI language models in academic studies,
2. To determine whether employing ChatGPT could be advantageous, and

3. To explore the limitations and challenges of using ChatGPT.

Responses generated by the ChatGPT:

The study aims to provide a comprehensive analysis to promote an informed discussion on the uses of ChatGPT in the research field by researchers. The technical and media industries are now embracing ChatGPT because of its simplicity. Now, it is widely used in academic institutions for research purposes. Researchers and students are taking help from ChatGPT in writing articles, papers, and assignments. Furthermore, the researchers have selected a demo topic on "Exploring the Potential of Non-Fungible (NFTS) in the Metaverse: Opportunities and Challenges" from ChatGPT." It has generated responses and successfully created innovative research ideas on metaverses and cryptocurrencies. Also suggested an introduction, objectives, research gaps, and literature reviews on the particular topic. Undoubtedly, researchers may get ideas to frame a research paper or article, but they should not rely on them wholly.

M Metaverse and cryptocurrency:: suggest some research topic

Research Topic 1: "The Impact of Cryptocurrencies on Virtual Asset Ownership and Value Exchange in the Metaverse"

Research Topic 2: "Cryptocurrency Adoption and User Perceptions in the Metaverse: A Comparative Analysis"

Research Topic 3: "Designing Decentralized Financial Systems for the Metaverse: Exploring the Potential of Cryptocurrencies and DeFi Protocols"

Fig. 1: Research topics generated by ChatGPT

Researchers have commanded ChatGPT to suggest new research topics on the metaverse and cryptocurrency. So it has suggested innovative research ideas on the topic of the metaverse and cryptocurrency. In the figure 1, it can be seen that ChatGPT is able to generate new ideas. Therefore, it can be used by the researcher to get new ideas about the particular area, although with little human intervention.

M Exploring the Potential of Non-Fungible Tokens (NFTs) in the Metaverse: Opportunities and Challenges: write introduction

Introduction:

The emergence of the Metaverse, a virtual universe where individuals interact with digital environments and each other in real-time, has opened up new possibilities for digital ownership, transactions, and experiences. At the forefront of this digital revolution are Non-Fungible Tokens (NFTs), a form of digital asset that represents ownership or proof of authenticity for unique items or digital content. NFTs have gained significant attention and traction in recent years, primarily within the realms of art, collectibles, gaming, and virtual real estate.

Fig. 2: Introduction generated by ChatGPT

Researchers have commanded ChatGPT to write an introduction titled "Exploring the Potential of Non-Fungible (NFTS) in the Metaverse: Opportunities and Challenges." ChatGPT has successfully produced an introduction, but researchers should abstain from copying and pasting the whole content; otherwise, it will be considered plagiarism. Researchers should use plagiarism software, like Turnitin, to check for plagiarism in the paper. Turnitin and iThenticate are popular tools for detecting replicated material in student proposals. By using plagiarism software, researchers can abstain from plagiarism in their research work. Although researchers get an idea from it of how to write and what to write in the introduction, It will also help them write articles, papers, and theses.

M Exploring the Potential of Non-Fungible Tokens (NFTs) in the Metaverse: Opportunities and Challenges: Suggest objectives of the study

Objectives of the Study:

1. To assess the current landscape of Non-Fungible Tokens (NFTs) in the Metaverse, including their applications in various sectors such as art, gaming, collectibles, virtual real estate, and virtual fashion.
2. To explore the opportunities that NFTs present in the Metaverse, such as enabling new revenue streams for creators, fostering user engagement, and facilitating ownership and value exchange of digital assets.

Fig. 3: Objectives of the study generated by ChatGPT

Researchers have commanded ChatGPT to write the objectives of the study titled "Exploring the Potential of Non-Fungible (NFTS) in the Metaverse: Opportunities and Challenges." It has successfully suggested the Objectives of the study. So, researchers can frame objectives based on responses generated by ChatGPT.

M Exploring the Potential of Non-Fungible Tokens (NFTs) in the Metaverse: Opportunities and Challenges:: write research gap



Research Gap:

While the potential of Non-Fungible Tokens (NFTs) in the Metaverse has garnered significant attention, there is still a notable research gap that needs to be addressed. Existing studies primarily focus on individual aspects of NFTs or specific industries within the Metaverse, leaving room for further exploration and understanding. Consequently, a comprehensive examination of the overall opportunities and challenges associated with NFTs in the Metaverse remains limited.

Fig. 4: Research Gap generated by ChatGPT

Researchers have commanded ChatGPT to write a research gap of the study titled "Exploring the Potential of Non-Fungible (NFTS) in the Metaverse: Opportunities and Challenges." ChatGPT has generated research gaps in the study. So, it is evident that ChatGPT can assist researchers in writing articles, and theses also help to find research gaps. However, academicians should be cautious while taking help from ChatGPT because it is based on amounts of data and sometimes will generate fake data or wrong information. So, there is a need for little human monitoring of the produced data or information by ChatGPT.

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Exploring the Potential of Non-Fungible Tokens (NFTs) in the Metaverse: Opportunities and Challenges:: suggest literature review



Literature Review:

1. Title: "Non-Fungible Tokens (NFTs) and the Metaverse: A Comprehensive Review"
Reference: Johnson, M., & Smith, A. (2023). Non-Fungible Tokens (NFTs) and the Metaverse: A Comprehensive Review. *Journal of Virtual Assets and Digital Economies*, 11(2), 87-105.
Summary: This literature review provides a comprehensive examination of the potential of Non-Fungible Tokens (NFTs) in the Metaverse. The authors explore the characteristics of NFTs and their unique features that enable verifiable ownership and scarcity in the digital realm. They discuss the opportunities that NFTs present in areas such as digital art, virtual real estate, virtual fashion, and in-game items, highlighting the potential for new revenue streams and economic models within the Metaverse. The review also addresses the challenges and considerations related to NFT adoption, including scalability, interoperability, copyright infringement, and environmental impact. The insights from this comprehensive review contribute to a deeper understanding of the opportunities and challenges associated with the integration of NFTs in the evolving landscape of the Metaverse.

Fig. 5: Literature review generated by ChatGPT
Researchers have commanded ChatGPT to suggest a literature review of the study titled "Exploring the Potential of Non-Fungible (NFTS) in the Metaverse: Opportunities and Challenges." It has suggested some literature reviews, but references are fake or wrongly cited, and it has framed references by itself. Researchers should not rely wholly on it for a literature review. They should cross-check references and citations produced by the ChatGPT. It is clear from the test that ChatGPT generates fake or wrong references. So, researchers should abstain from using it for the literature review, but they can get some ideas about it but not copy and paste the whole content directly.

M

Exploring the Potential of Non-Fungible Tokens (NFTs) in the Metaverse: Opportunities and Challenges:: suggest some references



Certainly! Here are some references that you can consider for your exploration of the potential of Non-Fungible Tokens (NFTs) in the Metaverse:

1. Aksit, S., & Karaca, B. (2022). Non-Fungible Tokens (NFTs) in Virtual Worlds: Opportunities and Challenges. In *Proceedings of the 20th International Conference on Virtual Systems and Multimedia (VSMM)* (pp. 123-130).
2. Bekele, A. M., Stancu, A., & Sorensen, S. A. (2021). Non-Fungible Tokens (NFTs): A Review of Opportunities and Challenges. In *2021 IEEE International Conference on Decentralized Applications and Infrastructures (DAPPS)* (pp. 122-131). IEEE.

Fig. 6: References generated by ChatGPT

Researchers have commanded ChatGPT to suggest references to the study titled "Exploring the Potential of Non-Fungible (NFTS) in the Metaverse: Opportunities and Challenges." ChatGPT has suggested some references, but all of the references are wrong. Therefore, researchers should not rely on it blindly and it needs human monitoring to recheck the articles it writes. Additionally, academic researchers are advised not to use citations and sources generated by ChatGPT directly.

Benefits of AI-Language Models for Researcher Productivity:

Researchers have overloaded information and sources that confuse them, but with the help of ChatGPT, they can search easily and retrieve data from it, including research papers, articles, and books. The ability of ChatGPT to automate the search for pertinent literature provides researchers with a valuable advantage by saving time and effort (Eke, 2023). This efficiency enables researchers to allocate more resources towards analyzing and synthesizing information, thereby enhancing their overall productivity. Chatbots offer various possibilities for expediting tasks, catering to individuals such as doctoral candidates working diligently to finish their theses and scholars who require literature reviews for their proposals and are forced to finish their work (Dis et al., 2023). ChatGPT is used in academic institutions and can be a useful tool for raising student satisfaction and participation (Sengupta et al., 2020). Many researchers put a lot of effort into polishing their academic writing. It can provide real-time suggestions for improving sentence structure, grammar, and coherence. This feature enables researchers to produce higher-quality manuscripts and reports more efficiently. ChatGPT can produce academic writings and even research papers that can equal the standard of essays by humans (Sardana et al., 2023). It can create new ideas and explore research from various perspectives. It works as an assistant by helping with research at every phase. Through interactive engagement, researchers can ask questions and receive unique insights that inspire novel lines of inquiry and foster innovative research directions. It can help in translation, allowing researchers to overcome language challenges and access a range of research literature (Baidoo et al., 2023). Researchers can quickly translate articles or communicate with colleagues in different languages, expanding their knowledge and fostering international collaboration. Students whose English is a second language and non-native students could

benefit from assistance in writing from ChatGPT. It offers students the best language models that can help them improve their language abilities. Despite its merits, utilizing artificial intelligence in education involves ethical and practical challenges (Munoz et al., 2023).

Challenges of AI-Language Models for Researcher Productivity:

ChatGPT is limited in information because data has not been updated after 2021 (Gilson et al., 2023). Sometimes, it generates incorrect or false data, references and citations that may cause issues for learners who depend on ChatGPT (Megahed et al., 2023). While using ChatGPT for educational purposes raises concerns about its accuracy and dependability, ChatGPT may be biased, robust, and reliable (Zhuo et al., 2023) because it is trained on a large amount of data (Sallam et al., 2023). Its ability to encourage cheating not only but also compromises academic integrity and goes against the stated goal of evaluation (Lo, 2023). The issue in academics is not just that it is freely and publicly available; it is also due to a lack of tools that can be used to identify plagiarism. Due to the abundance of readily available material online, it is getting easier for students to replicate material from many sources without providing proper citation (King et al., 2023). Plagiarism by students has grown to be a big concern in education, and to ensure academic integrity, Turnitin and other plagiarism detection applications are used to check plagiarism. Therefore, controlling students from cheating on assignments, theses, and dissertations presents another difficult challenge, especially given that ChatGPT is a far more potent tool than others use for similar tasks. It is becoming a concern that higher education is experiencing as more students use the internet for study and knowledge. As we know, researcher research work is often personal and sensitive; it can be a big concern regarding data security and privacy for those who use ChatGPT for their research work (Mhlanga, 2023). It may give inaccurate or deceptive responses, especially when addressing more complicated or specialized concepts (Scaringi et al., 2023). Although most of the research papers are published in the English language, there is a lack of research in this area in other languages (Kasneci et al., 2023). Researchers must be alert to ensure quality and fair research results while using ChatGPT.

Table 1: Number of Visitors of ChatGPT

Month	Number of Users
May 2023	1.9 bn*
April 2023	1.8 bn*
March 2023	1.6 bn*
February 2023	1 bn*
January 2023	616 mn**
December 2022	266 mn**
November 2022	152.7 mn**

Source: <https://www.similarweb.com/>

Note: bn* denotes billion, mn** denotes million

According to the data provided, the number of users of ChatGPT has been growing since its launch in November 2022. There were 152.7 million users in November 2022, and by February 2023, that number had quickly reached 1 billion. In May 2023, there was a significant increase of 1.9 billion users. This data indicates that ChatGPT gained popularity in its early months due to its simplicity, usability, and free availability. As a result, it is becoming increasingly popular among academics and researchers.

Discussion & Implications:

ChatGPT has two phases: it can be bad or good for the researcher. They can use it to generate new ideas, plan research methodologies, write introductions, frame objectives, and literature reviews. It has the capacity to enhance learning opportunities by giving students individual feedback. However, researchers should be careful while using it to summarize substantial literature rather than use it to write the literature review part by using ChatGPT. In addition, citations and references generated by using it should not be used directly by academic scholars (Rahman et al., 2023). Researchers should confirm the reliability of any data released by ChatGPT. They should check whether the source of the articles is reliable, use proper citations, and cross-reference twice, as suggested. Individuals should use ChatGPT legally, ethically, and with responsibility for their research work (Wu et al., 2023). It may unintentionally repeat bias in training information, raising ethical concerns. Researchers make sure that user privacy and data security are considered while creating AI-based educational systems to avoid biases and the perpetuation of disparities (Tlili et al., 2023). It has demonstrated the capacity to offer precise and illuminating responses to questions but sometimes it generates wrong or misleading information that is repetitive and inaccurate (Rudolph et al., 2023). It

doesn't create correct sources or citations, and their responses are paraphrases of previously published works without proper citation, which is plagiarism (Kohnke et al., 2023). The tests have shown that ChatGPT could avoid these tools by producing content that appears to be unique (Khalil et al., 2023). Therefore, researchers should not depend too much on AI language models that may impair their critical thinking abilities, impeding the development of independent thought processes and innovative ideas. Researchers should be responsible and know the guidelines and policies to maintain academic integrity (Ventayen et al., 2023; Graham, 2022; Walker, 2022). As the field of AI and chatbots progresses, it becomes crucial to conscientiously assess the implications of their utilization and adopt measures to prevent any potential misuse. It includes setting strict guidelines, policies, and training programmes designed to encourage moral conduct among those who use these technologies. Moreover, researchers can use the potential of AI-language models to advance their studies, extend knowledge, and make significant scientific advances by utilizing the advantages while being aware of the challenges. Therefore, researchers must be cautious about the use of ChatGPT and maintain a balance between utilizing its benefits and exercising their own analytical and creative skills. Since it was available for general usage, education-related academics and students have taken an immediate liking to it. The outcomes help build regulations and guidelines for researchers' ethical usage of it in their fields of study, thereby encouraging long-term researcher productivity.

Conclusion:

ChatGPT is the most powerful tool that helps in writing content. It has several advantages for increasing research productivity, but researchers must use it with some alertness and critical thinking. ChatGPT has various uses for students, researchers, and teachers (Haleem et al., 2022). Researchers can use the power of ChatGPT efficiently and use it in their research process by being aware of their potential difficulties and limitations. ChatGPT should be considered a helpful tool to boost research productivity rather than a substitute for in-person knowledge. It can increase research productivity and provide advantages like effective information retrieval, improve writing skill, idea generation, exploration, collaboration, get feedback, and multilingual aid. Researchers can save time, boost the caliber of their work, and promote innovation by utilizing ChatGPT. However, it is also significant to

understand that not all of these facilities benefit a student's development of learning skills, including writing abilities (Sok et al., 2023). It's crucial to recognise the challenges associated with AI-language models. There are significant obstacles that researchers must overcome, including information overload, a lack of contextual awareness, reliance and bias, ethical considerations, and the requirement for technical skills. Students and researchers should be ethical and responsible while using it. Also, they should use their critical thinking, thorough evaluation of responses, and adherence to ethical standards are necessary. Therefore, Students, researchers, and practitioners should use it along with other educational materials, not alone. Additionally, the researcher can use ChatGPT to produce papers, articles, and theses. It facilitates completing the challenging activities, including article writing, concept generation, and text paragraph composition (Zhou et al., 2023).

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Contributions

All authors equally contributed to the study's conception and design.

Madhuri Yadav: writing original draft preparation

Pushpam Singh: formal analysis, and investigation

Sukanta Kumar Baral: Writing, review and editing

Data Availability

Data sharing is not applicable to this article as no data were created or analysed in this study.

Ethics declarations

Competing interests

The authors declare no competing interests.

Ethical approval

This article does not contain any studies with human participants performed by any of the authors. The study uses secondary data produced by global organizations and made public for research.

Informed consent

This article does not contain any studies with human participants performed by any of the authors. The study uses secondary data produced by global organizations and made public for research.

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