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The Impact of Chat GPT On Scientific Publication and The Absence of Ethical Issues

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Abstract

The impact of the current technological period on society is enormous. Chatbots have gained popularity in the conversational services industry since the development of the best virtual assistants. Chatbots are computer programs that comprehend and process natural language. An overview of important terms pertaining to Chat GPT, a publicly available tool created by OpenAI, and its underlying technology, GPT, is given in this document. This paper discusses the generative pre-trained transformer model of GPT as well as its history and technology. The technology's adaptability to language-based tasks and how Chat GPT uses it to function as a sophisticated chatbot. An interview with Chat GPT about its potential impacts on academics and libraries is also included in the article. The interview discusses the benefits of Chat GPT, such as how it improves search and discovery, reference and information services, cataloging and metadata development, and content production, in addition to the ethical considerations that need to be made, such as privacy and bias. The prospect of using Chat GPT to write academic papers is also examined in the paper.

Keywords: Chat GPT, GPT-3, Generative Pre-Trained Transformer, AI, Academia, Libraries.

1. Introduction

A deep neural network architecture with multiple transformer layers is used to build Chat GPT. These transformers can produce outputs that are logical and human-like after processing sequential data, including natural language text. Chat GPT is trained on a large corpus of text data, allowing it to identify relationships and patterns between words, phrases, and sentences. Because the training process is iterative, the model continues to improve as it is exposed to new data (Haoxiang and S, 2021). After training, Chat GPT can be adjusted for particular uses or

The Journal of Computational Science and Engineering (TJCSE)
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Vol 3, No 4, April 2025
PP 45–59

jobs, including creating content or translating languages. An extremely advanced chatbot that has garnered a lot of interest in recent months. There are three sections to this study(Najm Mansoor and Al-Tamimi, 2022). Natural language processing and artificial intelligence are two important terms associated with Chat GPT that are defined in the first section along with their functions. The second section explores the background, capabilities, and technology of Chat GPT's underlying technology, Generative Pre-Trained Transformer (GPT)(Chen *et al.*, 2021). It describes the principles of GPT, how it was created, how big the program is and how much data is required to train it, and how it can handle a variety of language-based tasks such text production, question answering, and translation. The final component of the study presents the findings from an interview with Chat GPT regarding the possible impacts of AI and GPT on academics and libraries. It provides an example of what Chat GPT can do. This section will look at the moral considerations that need to be made when using Chat GPT and how it may be used to improve various library services.

2. Methods

2.1. The Rapid Review Approach

Given that Chat GPT is still receiving a lot of attention and that students are using it more frequently, it is imperative to comprehend how it affects education and act quickly to address any potential risks. But conducting a thorough systematic evaluation might take months or even years, which makes it difficult to keep up with the quickly changing Chat GPT landscape. As a result, a quick review method was applied. In order to generate information quickly, Tricco et al. state that "a rapid review is a type of knowledge synthesis in which components of the systematic review process are simplified or omitted"(Aiumtrakul *et al.*, 2023). This method made it possible to quickly summarize and synthesize recently released papers together with their main conclusions. As a result, this evaluation may offer insightful information that helps scholars, practitioners, and policymakers.

2.2. Findings

According to Figure 1, the database search yielded 50 results, while Google Scholar yielded 367. 363 distinct records were obtained for screening after some of the articles were eliminated becase of Google Scholar and database duplication. Notably, a large number of records that Google Scholar was able to retrieve were outside the pu view of our review. These data included articles from social media and the mass media.55 full- text publications were evaluated for eligibility after the titles, abstracts, and publishing sources of the unique records were examined. After that, five articles were eliminated: (1) two that had nothing to do with education, (2) one I complete

The Journal of Computational Science and Engineering (TJCSE)
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PP 45–59

preprint article, and (3) two literature reviews (Gómez Cano, Sánchez Castillo and Clavijo Gallego, 2023). Some of the removed items, nevertheless, served as background information. Fifty papers were ultimately chosen for synthesis. The Supplementary Materials contain a list of the included papers. An outline of the article selection procedure is shown in Figure 1.

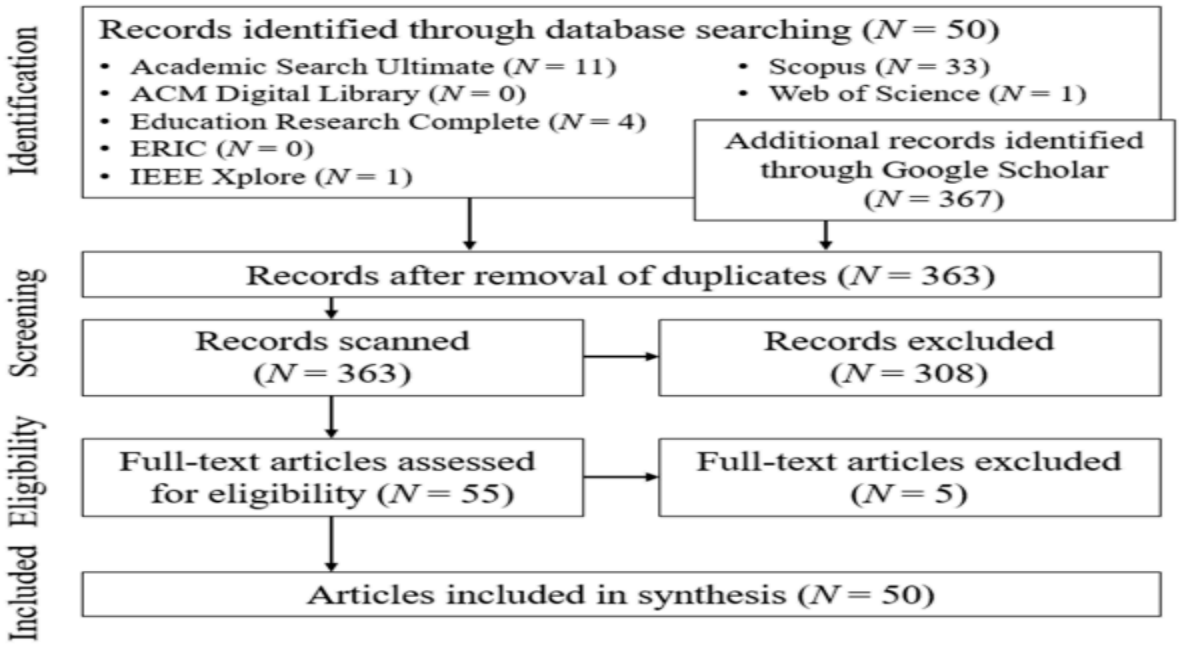

Figure 1. PRISMA flow diagram of article selection.

Figure 2 illustrates that the vast majority of the included papers (N = 19) were authored by American researchers.

Austria (N = 3) and the United Kingdom (N = 4) came next.

Of the 50 selected publications, 16 (32%) were published in journals, as shown in Figure 2.

and two were released as a report (2%), and an eBook (2%). The final 32 papers (64%) were preprints that were posted to SSRN (N = 12), followed by Research Gate (N = 5),(N = 7), among other places (Lo, 2023).

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Vol 3, No 4, April 2025
PP 45–59

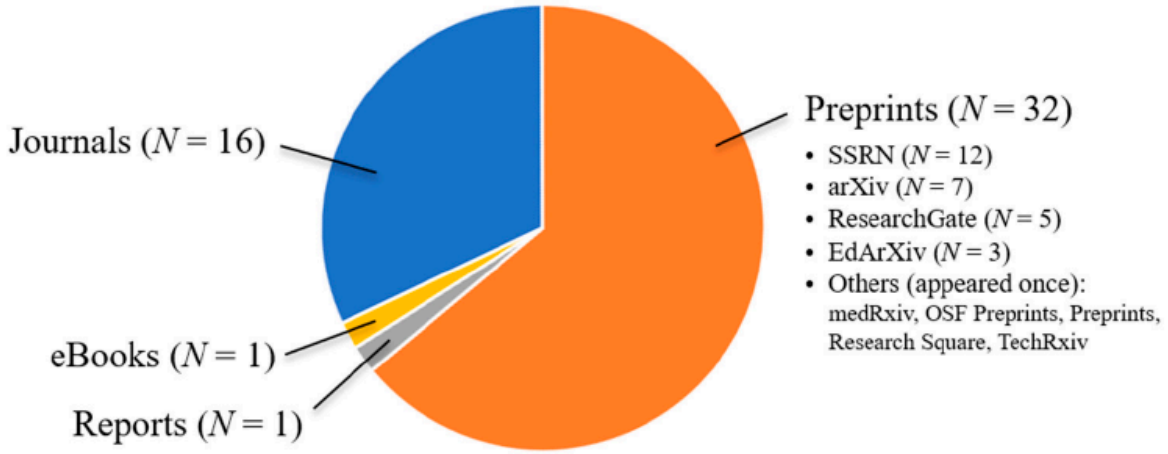

Figure 2. The collected papers' publication sources (N = 50).

2.3. Search Strategies

When choosing pertinent publications for this fast evaluation, The Preferred Reporting Items for Meta-Analysis and Systematic Reviews (PRISMA) guideline was adhered to. Three months after ChatGPT was released, on February 28, 2023, the last search was carried out. As a result, the ChatGPT used in these articles was first released on November 30, 2022 based on GPT-3.5, or Generative Pre-trained Transformer 3.5. Academic Search Ultimate, ACM Digital Library, Education Research Complete, and seven other electronic databases were utilized. (4) IEEE Xplore, (5) ERIC, (6) Scopus, Web of Science (7). In order to locate relevant publications with "ChatGPT" in the title, abstract, or keywords, the search string "ChatGPT" was entered into each database. The time frame for publishing was set as 2022 to the present. Only a small number of pertinent articles were discovered, even after searching several databases. Consequently, Google Scholar was used to perform a title search for the term "ChatGPT" during the same publication period. By using this method, more pertinent articles that were missed in the first database search could be found(Capra and Arguello, 2023).

2.4. Inclusion and Exclusion Criteria

Preprints and advanced online publications as well as scholarly articles produced between January 1, 2022, and February 28, 2023 (the date of the last search) were examined. Articles from mass media and other non-academic sources were not included. As of the time of writing, this time frame included every article that had been written on ChatGPT from its November 30,

The Journal of Computational Science and Engineering (TJCSE)
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PP 45–59

2022, release. Articles in the realm of education had to discuss ChatGPT, without regard to any particular educational environment, in order to be included for this quick evaluation. If available, literature reviews served as background information. Notably, these biologics are linked to a lower risk of systemic side effects than systemic corticosteroids, which are frequently used to address CRSwNP (Maniaci *et al.*, 2024). To prevent repeated findings, they were not included in the synthesis, nevertheless. Additionally, this evaluation only featured articles written in English. Table 1 summarizes the inclusion and exclusion criteria for article selection.

Table 1: summarization of the inclusion and exclusion criteria for article selection.

Criterion	Inclusion	Exclusion
Article Topic	Discuss GhatGpt in the field of education	Do not discuss GhatGpt in the field of education
Article Type	Academic articles	Non-academic articles, such as articles from mass and social media
Time period	1 January 2022 to 28 February 2023	Articles outside the time period
Language	English	Non-English

3. ChatGPT Details

3.1 How ChatGPT Affects Different Fields

- Academics: Academics could be revolutionized via Chat GPT. By offering personalized, interactive explanations, it can assist students in comprehending ideas they are finding difficult. Teachers may save time and effort by using the AI-powered system to assist them provide each student personalized feedback. ChatGPT can also be used to automatically provide students with comments and grade assignments and tests. Moreover. You can use ChatGPT to make innovative projects and materials. It can be applied, for instance. To develop interactive games and exercises that more deeply engage pupils. It can be utilized to develop intelligent tutors that offer students individualized direction and feedback as they advance in their academic careers (Kalla and Kuraku, 2023).
- Cyber Security: Because it may be used to identify and stop cyberattacks, Chat GPT has had a big impact on the field of cyber security. By examining the language used in the email, the language model can assist in identifying phishing emails and differentiating between authentic and fake emails. By examining the

The Journal of Computational Science and Engineering (TJCSE)
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Vol 3, No 4, April 2025
PP 45–59

language used in the code, Chat GPT can detect dangerous code and assist in malware detection. Additionally, Chat GPT can be used to generate safe passwords, which are hard to guess since they are complicated and one-of-a-kind.

- Customer Support: By offering clients individualized support, Chat GPT can enhance customer service. It can be used to build virtual agents that offer clients individualized support and guidance. It is possible to build these virtual agents to comprehend client requests and react appropriately. Furthermore, Chat GPT can be utilized to create automated systems that are able to identify possible consumer issues and promptly address them. For instance, it can be utilized to develop automated systems that can recognize issues for customers and provide solutions on their behalf. It can be utilized to develop intelligent customer support representatives who can offer clients individualized assistance and guidance. ChatGPT's customizability is another critical advantage. It can be fine-tuned to perform specific tasks or applications (Kalla and Kuraku, 2023).
- Information Technology: The information technology (IT) industry has been greatly impacted by Chat GPT. It has completely changed the way we engage with technology and facilitated information availability and utilization. These days, e-commerce, healthcare, and customer service are just a few of the areas that frequently use chatbots and virtual assistants. To comprehend and react to customer inquiries, they use natural language processing (NLP) technology. Additionally, Chat GPT has enabled more advanced search engines and recommendation algorithms that can provide more accurate and customized results. Furthermore, Chat GPT has created new opportunities for data analysis and cybersecurity, enabling IT workers to recognize dangers and take swifter, more efficient action. Since clients would utilize Chat GPT for initial assistance before contacting customer support, Chat GPT will eventually replace customer support positions, saving any firm a significant amount of money. Most of the time, Chat GPT can resolve the problem, which will lower the number of incoming cases or incidents and assist the company cut workers. Because of this, it may also have a detrimental effect on the labor market by reducing the number of positions involving customer service.

Researchers and Scholars: Scholars and researchers from a wide range of disciplines have been greatly impacted by Chat GPT. Specifically, it has transformed the manner in which we study natural language processing and artificial intelligence. Researchers can now more easily create and test new NLP models as well as analyze and understand vast amounts of text data thanks to

The Journal of Computational Science and Engineering (TJCSE)
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Vol 3, No 4, April 2025
PP 45–59

Chat GPT. Additionally, it has made it possible for academics to develop increasingly sophisticated chatbots and conversational agents that may be applied to a variety of fields, such as therapy, healthcare, and education. Researchers may now more easily access and analyze massive datasets from a range of sources, work together, and share data It's evident that integrating technologies like ChatGPT into their operations might have a significant positive impact on a number of industries in both the commercial and consumer sectors (George, George and Martin, 2023).

3.2 Features of Chat GPT

- Automated Conversations: Chat GPT's automatic dialogue features allow users to speak with a chatbot without a human operator.
- The system can quickly and accurately provide responses by finding patterns and relationships in the data it has been trained on.
- It is a helpful tool for businesses and organizations who require automated customer service or language translation services (Sharma, Sharma and Yadav, 2022).

· Improved Customer Service: Chat GPT can greatly enhance customer service by giving users prompt, precise answers to their questions. Because consumers can get the help they need quickly, this can boost customer satisfaction and loyalty.

· Cost-Effective Solution: Chat GPT reduces cost by doing away with the need for employing human operators to handle customer support inquiries. Businesses, particularly those that deal with a high volume of customer support inquiries, may save a lot of money as a result.

· Natural Language Processing: Chat GPT comprehends and reacts to natural language using natural language processing techniques. This makes it a very user-friendly tool since it can understand and react to user inquiries in a manner that resembles human communication.

· Personalized Responses: By keeping track of user preferences and adjusting its responses appropriately, Chat GPT may offer tailored responses. Because people believe the system can comprehend and adapt to their specific demands.This feature may make the user experience more engaging and rewarding. Chat GPT is a program that uses artificial intelligence (AI) to produce text that sounds natural under specific circumstances. It functions similarly to a personal writing helper, however instead of only fixing your grammar and spelling (Sharma, Sharma and Yadav, 2022).

3.3 How CHAT GPT Works

The Journal of Computational Science and Engineering (TJCSE)
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PP 45–59

At the heart of CHAT GPT is the Large Language Model (LLM) GPT-3.5, which is currently used in the application. However, it is important to note that CHAT GPT could also benefit from the use of the newer GPT-4 model, although not much technical information about it is currently available. GPT-3.5 underwent an intensive training process on a vast amount of Internet data. The source dataset used for training contains an incredible 500 billion tokens, which corresponds to hundreds of billions of words. During training, the model was exposed to a wide range of texts from different online sources.
The main goal of training GPT-3.5 was to teach the model to predict the next token based on a sequence of input tokens. This approach allows GPT-3.5 to generate text that is structured in a grammatically correct and semantically consistent manner with respect to the Internet data on which it was trained .A large language model developed by OpenAI, based on the GPT-4 architecture(Moritz, 2024) as shown in Figure 3.

Figure 3. Chat GPT Cycle.

3.4 PPO - Proximal Policy Optimization

PPO which stands for Proximal Policy Optimization, is a technique used in training machine learning models. Proximal Policy Optimization is a proximal policy optimization algorithm that is used to improve the performance of neural models during the training process. This algorithm is based on the concept of gradual improvement of decision policies, controlling the changes made to existing policies so as to ensure stability in training and better convergence to optimal results as in shown in Figure 4.

The Journal of Computational Science and Engineering (TJCSE)
ISSN 2583-9055 (Media Online)
Vol 3, No 4, April 2025
PP 45–59

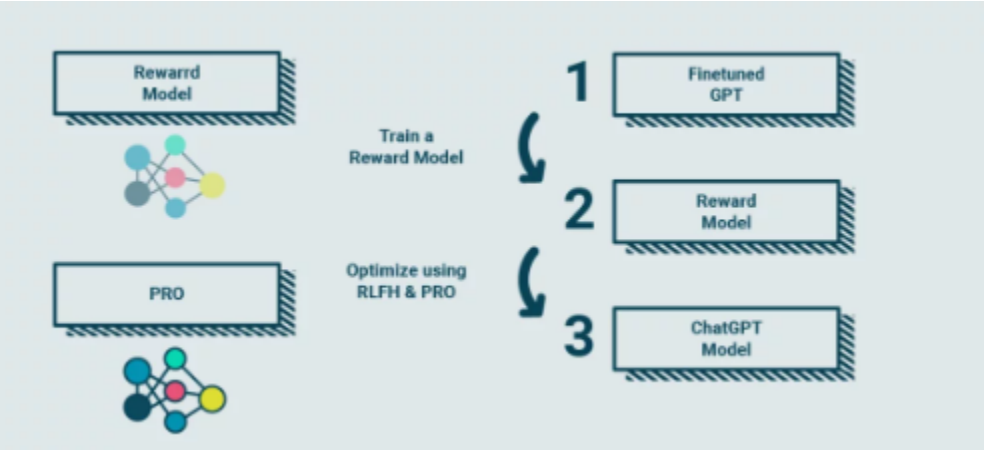

Figure 4. The Process of ChatGPT.

The goal of PPO is to refine the decision policies of machine learning models, enabling them to learn from training data more efficiently. This is accomplished through a series of iterations, in which the model performs actions and compares the results with a slightly modified version of the decision policies. The algorithm evaluates the differences between the two policies and, based on those differences, updates the existing policies to bring the results closer to the desired performance. PPO is distinguished by its ability to balance the exploration of new strategies with the use of information already learned from the model. This approach allows for better stability in training and greater efficiency in achieving optimal results. In addition, PPO offers advantages in terms of controlling changes made to decision policies, ensuring that changes are moderate and gradual, thus avoiding instability in learning and the occurrence of undesirable effects. So (PPO) is one of the most successful deep reinforcement learning methods (Meng *et al.*, 2023).

3.5 The Ethical of Implications Chat GPT in Academic Publication

Many ethical and privacy issues arise while using Chat GPT or other large language models in educational settings.

- The model's responses could be biased since they might mirror the training data's biases, which is one reason to be concerned. Concerns have also been raised over the model's potential for malicious usage and the privacy of the people whose data was utilized to train it. Because it could be used to mimic or deceive others, it's also critical to think about the ethical ramifications of producing extremely accurate synthetic text or speech. It's also critical to think about how using Chat GPT may affect data security and privacy. Highly sensitive data, including financial, medical, and personal information, can be produced by the model. Given these worries, it's critical to utilize these models sensibly and cautiously, and to think about the best ways to reduce any possible risks, ChatGPT if

The Journal of Computational Science and Engineering (TJCSE)
ISSN 2583-9055 (Media Online)
Vol 3, No 4, April 2025
PP 45–59

it is used as a tool in scientific writing and the ethical concerns surrounding its use.(Guleria *et al.*, 2023).

- Bias: Biases in the training data may be reflected in the model's answers, leading to unfair or erroneous outcomes. This could compromise the library's aim to provide equitable access to information and disproportionately impact vulnerable groups.
- Privacy: The ability of the model to generate artificial speech or text that is remarkably lifelike might be used to imitate or deceive people., which would be against user privacy. Furthermore, the model might produce sensitive data that needs to be kept private and not disclosed without express agreement, including financial, personal, and even medical data, another serious privacy risk we've observed involves Chat GPT profiling users based on their prompts. (Ullah *et al.*, 2023).
- Autonomy and informed consent: The use of Chat GPT should be explained to users, and they should be able to opt out or consent to the usage of their data.

Transparency and accountability: To enable the identification and correction of any potential biases or inaccuracies, Chat GPT's design, training, and deployment should be transparent, including the data used to train the model. Clear policies and procedures should also be in place to address any potential problems, Openness is not the full solution to the scientific and ethical challenges of conversational text generators (Liesenfeld, Lopez and Dingemanse, 2023).

3.6 **Limitations of ChatGPT**

One drawback of Chat GPT is that it only gives users a few number of dialogue options, which may limit their capacity to have deep discussions. Even while it can produce organic replies, users are still restricted to a preset range of choices, which some users may find constrictive and disappointing. Because Chat GPT is an AI language model, it might have trouble with some parts of natural language processing, which would make it challenging for users to comprehend or analyze its responses.

Even with its advanced algorithms and intensive training, Chat GPT might still require assistance in comprehending the subtleties of human language, which could result in misunderstandings and misinterpretations. Because Chat GPT lacks context, it could not be able to comprehend the context of a conversation and might provide erroneous answers. It may be simpler for Chat GPT to respond to user inquiries in a pertinent and useful manner if it is aware of the context (Zhou et al., 2024).

The domain knowledge that Chat GPT has learned from its training data limits its responses. It might therefore require assistance with extremely specialized or niche subjects. Because of this restriction, users looking for information on particular subjects outside of Chat GPT's purview may find it less helpful. Chat GPT might not be able to identify or react correctly to humor or

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ISSN 2583-9055 (Media Online)
Vol 3, No 4, April 2025
PP 45–59

sarcasm, two examples of emotional cues. It can provide responses that seem natural, but because it is unable to comprehend the emotional context of a conversation, it may produce incorrect or insensitive answers (AlZu'bi et al., 2023).

3.7 Limitations of the Included Articles

There are three main constraints related to the included papers in addition to the limits of this review. First, only a small number of research have objectively investigated how Chat GPT affects student behavior and performance. Using Chat GPT to help students with their writing may not enhance performance but rather increase the likelihood of plagiarism. However, these researchers noted that the small number of research participants hampered the study's generalizability. Further research is needed to evaluate the benefits and potential problems of Chat GPT-assisted learning for students. Because some of the suggestions made in the included articles were based on the researchers 'Intuitive beliefs rather than empirical evidence. For example, some scholars concentrate on critical thinking and creativity. However, there wasn't always a full discussion of the precise tactics to accomplish this. Therefore, in order to offer evidence-based suggestions for the use of Chat GPT in education, more thorough research is required (Mansoor and Al Tamimi, 2022).

3.8 Risks of Chat GPT in Scientific Research

Despite Chat GPT's potential to further scientific research, it's important to consider the risks associated with using this technology. First of all, training on data that is not representative of the target population can introduce biases and provide inaccurate or unreliable results, which could have detrimental effects on research. Second, when trying to analyze complex or nuanced data, Chat GPT may produce inaccurate or unreliable results, which could result in wrong conclusions and, ultimately, a decline in the credibility of research.Thirdly, since Chat GPT can be used to spread inaccurate information, create fake news, or influence public opinion, evil intent may be a problem. Fourthly, it might be challenging to comprehend the outputs produced by GPT, especially when there is a complexity of data. This makes it difficult to duplicate or confirm results, which lowers the research's validity. Last using Chat GPT might raise a variety of ethical issues, particularly with regard to privacy, consent, and fairness, particularly when sensitive data is involved or decisions that have an impact on both individuals and groups must be made. Even though Chat GPT might be a useful tool for furthering research, it's

The Journal of Computational Science and Engineering (TJCSE)
ISSN 2583-9055 (Media Online)
Vol 3, No 4, April 2025
PP 45–59

crucial to consider the possible hazards involved in using it to avoid any unfavorable effects(Guleria *et al.*, 2023).

4. Challenges and Threats Posed by Chat GPT in Education

The accuracy and dependability of Chat GPT present difficulties when used in educational settings. Chat GPT may be biased or contain errors because it was trained on a vast corpus of data. Bias may result from the usage of textbooks that are not generally applicable or research that has been done mostly in wealthy nations. For instance, Chat GPT is unfamiliar with news media owned by hedge funds. Furthermore, Chat GPT's knowledge is incomplete and hasn't been updated with data after 2024 as of yet. As a result, its answers might not always be precise or trustworthy, especially when it comes to recent events and specialized subjects. Additionally, Chat GPT could produce inaccurate or even fraudulent information. For students who depend on Chat GPT to guide their learning, this problem could be troublesome. Plagiarism by students is become a major issue in education. Applications for detecting plagiarism (such as iThenticate and Turnitin) are frequently used to detect plagiarized material in student assignments. Nevertheless, research indicates that Chat GPT can evade these sensors by producing information that appears to be unique. Therefore, compared to students who did not use Chat GPT, those who did had a higher likelihood of plagiarizing. The ability of Chat GPT to promote plagiarism undermines academic integrity and negates the goal of assessment, which is to fairly gauge students' learning. Students that produce excellent work using Chat GPT unfairly outperform their counterparts who do not have access to it. More significantly, when Chat GPT is used, teachers are unable to effectively assess student performance, which makes it challenging to investigate students' learning issues (Yu, 2023).

Table2. Techniques for handling plagiarism problems developed by Chat GPT.

Aspect	Strategies	Representative Quotes
Work design	Including multimedia materials	"Embedded images in exam questions may make it harder for students to cheat and for Chat GPT to generate accurate responses.
	Using innovative question formats	Additionally, [instructors] can reevaluate the kinds of questions they ask their students, emphasizing those that demand for analysis as

The Journal of Computational Science and Engineering (TJCSE)
ISSN 2583-9055 (Media Online)
Vol 3, No 4, April 2025
PP 45–59

		opposed to those that only call for [a] recollection of legal principles.
	Employing digital-free assessment formats	Making all evaluations of the "in-class" variety would be the "blanket solution," making it practically impossible for Chat GPT to be used in an unethical manner.
Identification of AI writing	Using AI-based writing detection tools	The AI-originated text was not detectable by plagiarism detectors, but AI detectors were.
	Checking references	"Even though references and citations were included in the text, they were all made up. This could lead to academic staff spotting it."
Policy of the Institution	Establishing anti-plagiarism guidelines	"Administrations ought to think about reshaping honor codes to control language model usage generally.
	Providing student education	"We advise students to be informed about academic integrity policies, comprehend the repercussions of academic misconduct, and receive academic integrity training."

5. Conclusion

In conclusion, Chat GPT is a cutting-edge technology that has completely changed the way we communicate with one another and with machines. It can produce human-like answers to user inquiries thanks to its natural language processing skills, and its efficiency, scalability, and customizability make it a perfect solution for a variety of applications. Even though Chat GPT has several drawbacks, like the possibility of prejudice, a lack of emotional intelligence, and a small knowledge base, they can be lessened with further programming and appropriate training data selection. All things considered, Chat GPT has had a major influence on a variety of industries, including software development, customer support, cyber security, and academia. Its applications are still being investigated, but it has enormous potential to increase user satisfaction, productivity, and efficiency. We can anticipate even more remarkable outcomes in the upcoming years as Chat GPT develops and gets better.

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