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ChatGPT and Academics: Its Suitability in Library and Infromation Science

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This study evaluates ChatGPT, a recently developed AI tool created by OpenAI, with an emphasis on its value for academic work in the discipline of Library and Information Science (LIS). The study investigates how ChatGPT responds to LIS queries by administering two sets of questions, with a total of eight questions, on each of the three topics selected for the study. The outcomes demonstrate ChatGPT's capacity to distinguish between various types of queries and deliver appropriate information. However, in terms of information accuracy and validity, it has been observed that there is a lack of specific information and the absence of suitable references. The major issue that was located is the fake and fabricated references provided by ChatGPT that need to be scrutinized thoroughly. The issue is especially considered to be important in the ambit of higher education since it creates major obstacles, particularly in the field of research. This is particularly in case of students, who impulsively follow the results without rationally examining it. It was also observed that ChatGPT gave a variety of responses to the same queries on various machines at distinct times. Authentic references are the basis of each research project. However, AI technologies, such as, ChatGPT do not provide realistic, verified references for specific topics, which might contribute to a lack of credibility and dependability in academic writing. The research analyzes the consequences of these findings and highlights the importance of addressing ethical issues around AI-powered academic tools. Also, libraries not only use AI based tools with caution while providing services using these tools, however, they also

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need to educate students about the strengths, limitations, and ethical considerations associated with these technologies.

Keywords: *AI-Based Information Services, AI Chatbots, Artificial Intelligence, AI tools, ChatGPT*

0 INTRODUCTION

Artificial Intelligence (AI), a rapidly emerging expanse of computer science, which is devoted towards creating computer programs that can emulate human thought and behavior. By automating chores, analyzing data, and even generating artificially intelligent assistants, this technology improves the convenience and effectiveness of our lives on a daily basis. The recent development in language model technology is ChatGPT (Chat Generative Pre-Trained Transformer), which has surfaced as a popular tool being used globally by professionals from all walks of life.

It is an advanced and refined language model that has been painstakingly trained on large datasets, enabling it to interpret and produce writing that is more akin to human-like. The cutting-edge technology behind ChatGPT is a highly sophisticated chatbot that has gained significant attention in recent months. Its structural architecture is tremendous at gathering information, deriving meaning, and producing replies that closely resemble human speech. Through the help of deep learning, ChatGPT continuously improves its comprehension with each contact, allowing it to decipher user inquiries and offer thoughtful, contextually appropriate answers. This AI-driven system engages users with ease, bridging the communication gap between humans and machines.

ChatGPT has gained wide acceptance in academics due to its capability to produce writing that is human-like by simulating syntax patterns from enormous web databases and thus providing important assistance for research projects. It is being extensively used by students and researchers to expedite the completion of their academic work. Libraries are also considering using ChatGPT for providing reference services.

So, it is imperative to study the suitability of ChatGPT in academics. The possible uses and applications of ChatGPT in numerous scholarly fields have been examined in recent publications. These studies portray that ChatGPT is capable of providing information and summarizing it in the wink of an eye, but the authenticity of provided information and its ethical use are doubtful.

This paper is an in-depth examination of how ChatGPT responds to queries in the field of Library and Information Science (LIS),conducts the analyses of the responses for authenticity and fabricated references and ascertains its suitability for academic work.

1 REVIEW OF LITERATURE

On November 30, 2022, OpenAI published the first demonstration of ChatGPT, and the chatbot soon became popular on online platforms as people posted instances of what it might achieve. It has been extensively used since then in all disciplines.

The literature study on ChatGPT attempts to thoroughly examine its applications and ethical implications across various arenas. An attempt was made by Aydin and Karaarslan[1] to perform an analysis of the literature on medical care for a scholarly publication using ChatGPT, however, they encountered complications owing to insufficient paraphrased content, a lack of synthesis, and cases of plagiarism, which impacted the overall efficacy of their evaluation.

On the contrary, a study by Alafnan et al.[2] found that ChatGPT could paraphrase efficiently and suggested that plagiarism checking software needed to be updated accordingly to detect paraphrasing done by AI tools. Gravel et al.[3] evaluated ChatGPT's efficacy in addressing medical inquiries and giving appropriate citations, finding that healthcare professionals rated the responses rather low owing due to the inconsistencies in logic and the high number of fabricated references in ChatGPT-generated output.

Lo[4] investigated ChatGPT's different educational abilities, revealing its ability in economics and coding while at the same time, highlighting weaknesses in arithmetic. Farrokhnia et al.[5] carried out a SWOT analysis recognizing ChatGPT's strengths yet also highlighted shortcomings, such as, its limit in comprehending word connotations and issues determining information authenticity. These limitations were deemed to constitute risks in the academia including impediments to personalized academic growth and ethical dilemmas. Another study by Rahman et al.[6] to investigate ChatGPT's capacity to generate literature reviews in APA format, cautions against relying solely on ChatGPT for comprehensive literature reviews due to limitations in accessing original sources and synthesizing research findings.

Ayinde et al.[7] investigation also raised alarms about the legitimacy of scholarly references and citations provided by ChatGPT, particularly in educational contexts. ChatGPT's propensity to generate bogus citations, including false author names, publishing years, titles, and DOI numbers, stressing the critical role of accurate references in scientific literature was highlighted by Frosolini et al.[8] Bhattacharyya et al.[9] critically evaluated ChatGPT-3.5's scientific validity, revealing a high rate of false or incorrect references, and emphasized the necessity of cross-referencing healthcare information with trustworthy sources. Osama and Afridi[10] investigated ChatGPT's capability to generate realistic and intelligent text in response to user queries. While ChatGPT is commonly used in scientific writing for activities such as creating outlines,

abstracts, and research paper introductions, the study reveals its limits. ChatGPT is inadequate in specialized knowledge, inventiveness, and analytical abilities. It may not completely comprehend the context of the text it creates, resulting in inaccurate replies. The authors lay considerable emphasis on the need of users to verify the accuracy of the material, checking for plagiarism, and ensure proper citations. They arrived at the conclusion that ChatGPT replies should be regarded as a starting point rather than a replacement for human skill and intellect. Nguyen-Trung et al[11]examined the impact of AI-powered tools, such as, ChatGPT, Casper AI, and ChatPDF on research efficiency, focusing on research review and compilation. These tools assist researchers to explore patterns and links among publications during various phases of study, including searching for literature and abstract scanning. It was established that integrating AI technologies considerably enhanced research efficiency, providing benefits, such as, faster search string creation and improved communication via summaries. But they suggested that researchers must, however, validate results. Vargas-Murillo et al.[12] conducted a systematic literature review to examine the use of ChatGPT in higher education. They observed on its impact, challenges, and opportunities in digital education. The observations were categorized into groups, offering insights into the pros and cons of using ChatGPT in education. The study found that ChatGPT has the potential to improve academic and librarian-related tasks in higher education. However, it also emphasized the significance of considering the ethics and responsible use of this technology in the sphere of educational settings. In addition, Walters and Wilder[13]explored the issue of falsified bibliographic citations in literature reviews generated by ChatGPT. They compared the performance of ChatGPT-3.5 and ChatGPT-4. The research highlights the persistence of errors in citations generated by both models. The study emphasizes the importance of maintaining scientific integrity and not solely relying on AI tools like ChatGPT for accurate citations.Day[14]tested ChatGPT response to queries in the field of geography and observed that ChatGPT generated false references. Assisting them, Orduña-Malea and Cabezas-Clavijo[15] raised an apprehension about the presence of fake bibliographic references in research publications due to the use of ChatGPT. They stress the need for authors and publishers to verify the legitimacy of references and not depend solely on ChatGPT-generated outputs.

Chen's[16] experiment examined ChatGPT's functionality as compared to that of the traditional library chatbots to communicate, indicating ChatGPT's superior skills in replying to referencing and written material requests, implying that it has the capability to improve library services. Supporting this, Mali and Deshmukh[17] investigated ChatGPT's application in library services, addressing ethical concerns and potential benefits, emphasizing the importance of upholding integrity, responsibility, ongoing review, and continuous improvement when utilizing ChatGPT for reference services in libraries. It can also analyze

large volumes of text data generated by user interaction and can also assist in identifying models related to user behavior that helps in developing personalized library services.

They believed that ChatGPT is a valuable tool in handling routine queries, yet it cannot be considered as a replacement for human reference librarians. Aithal and Aithal[18] have also enumerated the methodology with which libraries can use ChatGPT to optimize services although keeping in mind the biases and the inaccuracies in GPT algorithms. Also, Lund and Wang[19] investigated the expected advantages associated with ChatGPT in academics and libraries, emphasizing its function in summarizing papers, choosing appropriate literature, and improving the retrieval of information.

The research they performed, however, highlighted the need for immediate action to tackle ethical issues, such as potential presumptions in replies and concerns about confidentiality. Incorporating ChatGPT into their toolkit, libraries are able to gain access to a vast array of opportunities for enhancing the user experience. This state-of-the-art tool empowers librarians to seamlessly handle common queries, simplify the navigation of complex databases, and guide users to a trove of valuable resources. ChatGPT acts as a driving force in the transformation of library services, offering the potential for elevated user engagement and satisfaction. However, itis crucial to remember that while ChatGPT plays a central role, a comprehensive understanding of user preferences entails the integration of diverse research methodologies and techniques[17].

2 OBJECTIVES

The objective of the study is to test the suitability of ChatGPT for literature search for academic work in the field of LIS,

- To identify whether ChatGPT is able to recognize and differentiate between queries of What, Why and How type and provide response accordingly.
- To ascertain whether correct references are provided by ChatGPT for the information given by it.
- To find out whether ChatGPT is able to provide a bibliography suitable for review of literature.
- To identify the advantages and pitfalls in using ChatGPT for academic work.

3 RESEARCH METHODOLOGY

Three diverse topics were selected to test the response of ChatGPT. The topics taken were problem statements of three ongoing Ph.D. research in the Department of Library and Information Science, Dr. Harisingh Gour V.V.,

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Two sets of questions were drafted for each problem statement.

- The first set had three (03) questions of what, why and how type.
- The second set had five (05) questions on constructing a bibliography related to the problem statement. Initially, ChatGPT was asked to create a bibliography for the problem statement to analyze whether it could comprehend the complete problem statement. The problem statement was then broken down into two subject facets and ChatGPT was asked to provide bibliography for these subject terms. In the next question, terms were added to narrow down the scope and make the term more specific to problem statement.

The response to each question was analyzed for its relevance and authenticity.

The questions were tested once again from another computer at different time.

4 ANALYSIS AND DISCUSSION

ChatGPT was tested, as per the methodology, by selecting 03 problem statements and then formulating two sets of questions, with 03 questions of what, why and how type and 05 questions on generating bibliography respectively, on each of the problem statements. The response to each question was systematically analyzed for its authenticity and usefulness for academic work.

Problem Statement 1: A Study on Library Security System in Selected Government State University Libraries of Madhya Pradesh

Table-1.1. below shows the response to the What, Why and How type of questions on the above problem statement and the findings are given below with the question administered to ChatGPT.

TABLE-1

41 Overview of Library Security

Question	Relevance of Answer			References		
	Very Relevant	Relevant	Not Relevant	Correct	Fake/Fictional	Not Provided
Q.1.1	-	Yes	-	-	-	Yes
Q.1.2	Yes	-	-	-	-	Yes
Q.1.3	-	Yes	-	-	-	Yes

Q. 1.1 What is Library Security System?

Findings: The answer to the above question by ChatGPT was found to be relevant. Electronic security measures like security gates, electronic article surveillance system, RFID, etc., as well as staff vigilance, security policy and user education are explained. However, other conventional security measures like grilled doors and windows, deployment of security guards, smoke sensors and fire extinguishers, and data security were not addressed. References were not provided.

Q.1.2 Why Security is Important in Libraries?

Findings: The response was found to be very relevant. The importance of security in libraries was explained covering ten aspects namely- Protecting Valuable Resources, Preventing Theft and Vandalism, Ensuring Equitable Access, Maintaining Safe Environment, Alleviating the burden of Staff, Preserving Privacy, Preventing Misuse of Resources, Reducing Costs, Fostering a Positive Community Environment, and Legal and Ethical Responsibilities. But references for the given response were not provided.

Q. 1.3 How to Develop a Secure Library?

Findings: A step-by-step process explaining the Assessment and Planning, Implementation of Physical Security Measures; Using Technology; Developing Security Policies and Procedures, Training and Education; and Regular Evaluation and Improvement was provided in response to the question. It did not mention any guidelines or standards by national and international organizations. The information was found to be relevant, although it lacked references.

Table 1.2 displays the response to 05 questions on generating bibliography related to the Problem Statement 1. The questions asked and findings are given below.

TABLE-2

42 Bibliography on Library Security

Questions	References		
	Total Number	Correct	Fictional
Q.1.4	0	-	-
Q.1.5	10	-	10 (100%)
Q.1.5.1	10	-	10 (100%)
Q.1.6	10	-	10 (100%)
Q.1.6.1	10	-	10 (100%)

Q. 1.4Bibliography on "A Study on Library Security System in Selected Government State University Libraries of Madhya Pradesh".

Q. 1.5Bibliography on "Library Security".

Q. 1.5.1 Bibliography on "Library Security in India".

Q. 1.6 Bibliography on "Library Security System".

Q. 1.6.1 Bibliography on "Library Security System in University Libraries".

Findings: ChatGPT could not provide any bibliography on specifying the complete problem statement in

Q. 1.4. It however provided the structure/style for citing a scholarly document.

It responded that it could only provide fictional references and provided a list of 10 references each for rest of the above questions (Q.1.5, Q.1.5.1, Q. 1.6 and Q. 1.6.1).All of the 40 (100%) references were checked and were found to be fictional.

Problem Statement 2: Assessment of Service Quality in Affiliated Government Engineering Colleges of Rajiv Gandhi Prodyogiki Vishwavidyalaya (RGPV), M.P.

Table 2.1. below shows the response to the What, Why and How type of questions on the above problem statement and the findings are given below with the question administered to ChatGPT.

TABLE-3

43 Overview of Service Quality in Library

Question	Relevance of Answer			References		
	Very Relevant	Relevant	Not Relevant	Correct	Fake/Fictional	Not Provided
Q. 2.1	Yes	-	-	-	-	Yes
Q. 2.2	Yes	-	-	-	-	Yes
Q. 2.3	-	Yes	-	-	-	Yes

Q. 2.1 What is meant by Quality Library Services?

Findings: ChatGPT defined it as "a provision of excellent and effective services to patrons". It emphasized on providing varied resources, reference service, use of technology, conducting activities to increase user engagement, and feedback to assess user need and continuous improvement. So, the response was found to be very relevant.

Q. 2.2 Why Assessment of Quality is Important in Libraries?

Findings: The response was very relevant. It addressed aspects related to user satisfaction, improved library management and staff development.

Q. 2.3 How to assess quality of library services?

Findings: A step-by-step process, from setting objectives to evaluation

and improvement, was provided in response to the question. But it was very general in approach, and it failed to mention any models, standards or tools. So, the response was found to be relevant.

Table 2.2 displays the response to 05 questions on generating bibliography related to the Problem Statement 2. The questions asked and the findings are given below.

TABLE-4

44 Bibliography on Service Quality in libraries

Questions	References		
	Total Number	Correct	Fake
Q. 2.4	0	-	-
Q. 2.5	15	5 (33.33%)	10 (66.67%)
Q. 2.5.1	10	-	10 (100%)
Q. 2.6	15	14 (93.33%)	1 (0.07%)
Q. 2.6.1	10	-	10 (100%)

Q. 2.4 Bibliography on "Assessment of Service Quality in Affiliated Government Engineering Colleges of Rajiv Gandhi Prodyogiki Vishwavidyalaya (RGPV), M.P."

Findings: ChatGPT could not give a bibliography on the topic, but it suggested searching for the same in IEEE Xplore, Science Direct, ACM Digital Library, ERIC, JSTOR, ProQuest and library catalogues.

Q. 2.5 Bibliography on "Quality in Libraries".

Findings: A list of 15 references were provided stating that they are from academic journals. Out of 15 only 5(33.33%) were found to be correct and 10(66.67%) were fake.

Q. 2.5.1Bibliography on "Quality in Libraries in India".

Findings: A list of 10 references were provided stating that these were "specifically focused on quality in libraries in India". All the 10 (100%) references were found to be fake.

Q. 2.6 Bibliography on "Service Quality Assessment".

Findings: A list of 15 references was provided in response to the query and it was found that 14 (93.33%) were correct and only 01 (0.07%) was fake.

Q. 2.7 Bibliography on "Service Quality Assessment in Engineering Colleges".

Findings: A list of 10 references was provided stating that these were "specifically focused on service quality assessment in Engineering Colleges".

All of 10 (100%) were found to be fake.

Problem Statement 3: Assessment of Information Literacy Competencies and Awareness of G2C Initiatives of Farmers in Sagar District of Madhya Pradesh

Table 3.1. below shows the response to the What, Why and How type of questions on the above problem statement and the findings are given below with the question administered to ChatGPT.

TABLE-5

45 Overview of Information Literacy

Question	Relevance of Answer			References		
	Very Relevant	Relevant	Not Relevant	Correct	Fake/Fictional	Not Provided
Q. 3.1	Yes	-	-	-	-	Yes
Q. 3.2	Yes	-	-	-	-	Yes
Q. 3.3	-	Yes	-	-	-	Yes

Q. 3.1 What is Information Literacy?

Findings: The response was very relevant as it defined the varied aspects of information literacy like identifying information needs, evaluation of sources and information, conceptual understanding, synthesis and communication, ethical use and also technology proficiency. But no references were provided.

Q. 3.2 Why Assessment of Information Literacy is Important?

Findings: ChatGPT correctly emphasized its importance in the holistic development of an individual leading to one's personal, academic and professional growth. It listed ten valid reasons like skill development leading to professional growth, lifelong learning, safe guarding from misinformation and others. Hence, the response was found to be very relevant. However, no references were provided for the given information.

Q. 3.3 How to Assess Information Literacy of Farmers?

Findings: The response was relevant as it provided a systematic procedure from setting objectives to feedback and evaluation. It also suggested use of survey, case studies, role playing, group discussion and observation for assessment of information literacy in farmers. But it did not mention any information literacy models or standard assessment tools. No references were provided.

Table 3.2 displays the response to 05 questions on generating bibliography related to the Problem Statement 3. The questions asked and the findings are given below.

TABLE-6

46 Bibliography on Information Literacy Assessment of Farmers

Questions	References		
	Total Number	Correct	Fake
Q. 3.4	0	-	-
Q. 3.5	0	-	-
Q. 3.5.1	5	-	5 (100%)
Q. 3.6	6	-	6 (100%)
Q. 3.6.1	0	-	-

Q. 3.4 Bibliography on "Assessment of Information Literacy Competencies and Awareness of G2C Initiatives of Farmers' in Sagar District of Madhya Pradesh".

Findings: ChatGPT responded that it does not have access to bibliography on this topic. It suggested searching for information in academic databases like PubMed, JSTOR, Science Direct, IEEE Xplore and Google Scholar. It also suggested searching in library catalogues, theses databases, government organization databases and research organizations. It did not provide any specific names or URLs. It divided the given string in three key terms – "information literacy assessment farmers", "G2C initiatives awareness" and "Sagar District Madhya Pradesh" and suggested searching using these key terms.

Q. 3.5 Bibliography on "Information Literacy of Farmers".

Findings: Bibliography on the topic was not provided although it suggested 18 key terms to search for the information. Out of 18 key terms 08 key terms like – "farmers", "information literacy", "rural development", "ICT in agriculture", etc. were too broad and of little relevance however 10 key terms like "information needs of farmers", "rural information literacy", "farm information access", etc. were of relevance.

Q. 3.5.1Bibliography on "Information Literacy of Farmers in India".

Findings: It responded by "here are few references from academic sources" and provided a list of 5 references, all of which (100%) were found to be fake.

Q. 3.6 Bibliography on "G2C Services for Farmers".

Findings: ChatGPT responded that it could provide only general sources and for specific sources the researcher should refer to academic databases, research repositories and government websites. It provided 6 references and all 6 (100%) were found to be fake.

Q. 3.6.1Bibliography on "G2C Services for Farmers in India".

Findings: It expressed its inability in providing references for the above topic, but it suggested searching in Government websites and NGO for schemes and programs for farmers and exploring agriculture university repositories and academic databases. It also provided specific names like NIC, Kisan Call Centre and e-NAM(Electronic National Agriculture Market).

Questions were tested again on a diverse computer at different time.

Findings: ChatGPT gives a varied response on various computers at varied times.

5 FINDINGS AND RECOMMENDATIONS

It is clearly evident from the observations that ChatGPT is an excellent tool to attain an overview on a topic of study. It is able to distinguish between what, why and how type of questions and give pertinent and relevant answers to the query. However, it does not provide specific definitions, brief history or technical details like models and standards. It also failed to provide references. Hence, it is rather problematic in determining the legitimacy of the information which may be extremely difficult for a student especially if the student is a novice to the subject area. Further, the students are required to provide definitions, brief history, and the initiatives at the national and international level such as drafting of guidelines, development of standards or models, etc. Lack of background information and references which limits the utility of the requisite information for academic purposes.

Literature review forms the basis for any scholarly work irrespective whether it is a Research Report at the undergraduate level or a thesis at Ph.D. level. However, a response by ChatGPT for bibliography was found to be extremely erratic. There have been several times, that it responded with its inability provide a bibliography and at other times it responded by giving a fictitious list of references. Even though ChatGPT specifically mentioned that "a fictitious list of references is being provided", numerous students are tempted to use these references in their work and pass it off as authentic references.

Even more worrying is the fact that ChatGPT is not only providing a list of fake references rather it claims them to be from academic sources. Some of the references were found to be authentic while others were proved to be fake. This could lead to a drastic and confusing situation for the students. On giving the same queries again on various computers at altered times, ChatGPT provided a variety of responses. It would be appropriate to mention that inconsistency in response further adds to ambiguity and doubt and its utility for academic work.

ChatGPT is an extremely popular tool and is being extensively being used by students for writing assignments and research reports. Specifically, in the

context of India, students at school and college level are using ChatGPT for their assignments, projects and dissertations where plagiarism check is not strictly adhered to. Hence, it is imperative that the students should be made aware of the pitfalls of using ChatGPT and an appropriate know-how to ascertain the authenticity of the information provided by it. Libraries at the same time should use ChatGPT responsibly, considering its restrictions. In alignment with this notion Cox and Tzoc[20] have also stated "Considering their benefits, artificial intelligence cannot totally substitute the human relationships that librarians require".

The literature review also shows that there are several researchers who have voiced their concern about the rampant use of ChatGPT. It undoubtedly has innumerable capabilities and rather brings along limitations and ethical concerns. To effectively use ChatGPT for academic work we need to find the right mix of AI capabilities and human intellect, to discern correct from wrong. Certainly, BARD and Perplexity are two AI-based software tools that can help address some of the shortcomings of ChatGPT by providing proper referencing and related material to specific topics. We need to explore other AI tools and compare their pros and cons to choose the appropriate tool for a particular work.

Libraries utilize ChatGPT to enhance their services and streamline user experiences by providing frequently asked questions, removing the language barrier by providing translation service and assisting researchers by providing tips on asking the right questions to get the best search results. Hence it becomes the responsibility of libraries to conduct awareness sessions and lectures about the proper usage of AI tools like ChatGPT to ensure users understand the strengths, limitations, and ethical considerations associated with these technologies. The focus should be on emphasizing that AI tools are supplements, not replacements, and empowering users to utilize them effectively in their quest for information and knowledge.

6 CONCLUSION

ChatGPT and other AI technology may be of outstanding assistance in a large number of situations, however, the use of ChatGPT in academia and scientific writing should not be done without careful consideration. Being a widely used tool, an ethical usage of ChatGPT has been approved by a number of respectable publications. However, lacking thorough examination and particular domain expertise, the information produced by ChatGPT cannot entirely be accepted as legitimate.

An in-depth analysis of ChatGPT's replies to questions on countless research areas, reveals how inconsistent the information is in terms of relevancy and reliability. Notably, replies can change enormously when the same topic is

asked of various ChatGPT implementations. The study by Osama and Afridi[10] suggested that it is important to check the generated text for plagiarism and ensure its proper citation. Further, they stated "ChatGPT response should be treated as a starting point and it cannot replace human expertise, content awareness, expertise and intelligence." Supplementing this notion, present study also shows that many of the references produced by ChatGPT on certain subjects have poor legitimacy and are either false or erroneous. For this reason, it's all the more necessary to use discretion and diversify research methods in addition to ChatGPT-3.5.Keepingthe present scenario in mind with increasing use of ChatGPT by students, libraries too need to realize their responsibility and focus on imparting information literacy programs to educate students on the judicious use of ChatGPT.

GPT-4, the most recent version, improves user alignment, reduces the possibility of objectionable information, improves scientific correctness, and steerability, and provides instantaneous internet access. These enhancements improve interaction with users, assurance, precision, customization, and the ability to access information in real-time, indicating a substantial development in the capabilities of artificial intelligence[21]. When compared to GPT-3.5, OpenAI says that their replies are 40% more likely to produce factual findings[22]. However, it is not open access and its capabilities for use in academic work needs to be tested.

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