

# Usability and Efficacy of AI Chatbots (ChatGPT) vs. Conventional Web Searching Tools for Academic Research

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Abstract—The rapid evolution of AI technologies has significantly impacted chatbot development, with ChatGPT emerging as one of the most widely adopted AI tools. Since its launch in late 2022, ChatGPT has experienced exponential growth, reflecting its increasing role in various domains, including academic research. This study explores ChatGPT's user experience and its function in academic research, focusing on its effectiveness in literature reviews, research brainstorming, and manuscript drafting. A statistical approach is employed to analyze user responses, providing insights into ChatGPT's usability, accessibility, and impact on research efficiency. The findings indicate that while ChatGPT offers valuable support, challenges related to interface satisfaction and usability inconsistencies remain. This study contributes to the ongoing discussion on AI's role in academia by presenting empirical data on researchers' experiences with ChatGPT. The results highlight the tool's potential and areas for improvement, guiding future advancements in AI-assisted academic research.

## I. INTRODUCTION

The evolution of AI technologies has been derive chatbot technology. ChatGPT has seen remarkable growth since its launch in late 2022. By early 2024, it had surpassed 100 million active users, with daily interactions exceeding 10 million. Its user base continued to expand rapidly, reaching over 173 million by mid-2024, alongside over 1.8 billion monthly website visits. This growth reflects increasing reliance on AI for tasks ranging from casual inquiries to professional assistance, making ChatGPT one of the most widely adopted AI tools globally. ChatGPT's popularity stems from its versatility, user-friendliness, and advanced capabilities. It provides instant, conversational responses that cater to a wide range of needs, including answering questions, drafting content, coding assistance, and learning support. Its natural language understanding makes interactions intuitive and engaging, appealing to both casual users and professionals. Additionally. constant updates and improvements, like access to plugins and real-time browsing, enhance its functionality. The platform's accessibility, via both free and premium versions, ensures broad reach, making it a go-to tool for productivity, creativity, and problem-solving in various purposes.

Thus, ChatGPT is became valuable tool for academic research, providing research scholars with efficient support in various stages of their work. It helps streamline the literature review process by summarizing academic papers, generating insights, and identifying key trends in a field of study. Scholars can use it to brainstorm research questions, develop hypotheses, and outline methodologies. Additionally, ChatGPT assists in drafting and editing manuscripts, ensuring clarity and coherence in academic writing. Its multilingual capabilities enable access to diverse resources, while its ability to explain complex concepts makes it an excellent companion for research. By saving time and enhancing productivity, ChatGPT empowers researchers to focus on innovation and critical analysis.

Thus, the purpose of this study is to investigate ChatGPT's user experience and function in the academic research. To do this, we employ a basic statistical approach, which seeks to provide a comprehensive explanation and accurate understanding of the phenomenon, followed by an objective analysis to provide findings. We contribute to the literature by providing useful details regarding the experience of the academic community with this cutting-edge technology.

The paper is structured as follows: Section 1 provides a review of relevant research on the topic. Section 2 outlines the research methodologies used in the survey, followed by the presentation of results and data analysis. Finally, Section 3 discusses the findings and their implications for future research, concluding the paper.

## II. REVIEW OF LITERATURE

The development of ChatGPT marks a significant evolution in artificial intelligence, transforming from a system that processes digital content into an interactive chatbot capable of engaging in natural conversations. Initially, AI language models were primarily designed to analyze and generate text based on patterns in large datasets. Early iterations, such as OpenAI's GPT-1 and GPT-2, demonstrated the ability to produce coherent and contextually relevant text. However, these models lacked real-time interaction and adaptability, limiting their usability as conversational agents.

With the introduction of GPT-3, the model exhibited a more refined ability to understand and generate human-like responses, making it a strong foundation for chatbot development. OpenAI then fine-tuned the model using reinforcement learning from human feedback (RLHF), enabling ChatGPT to respond more accurately, maintain context in longer conversations, and align with user needs. Further advancements in ChatGPT, including memory capabilities and multimodal features, have enhanced its



interactivity, making it more dynamic and responsive. The shift from a static digital content generator to an advanced chatbot has revolutionized AI-assisted communication, enabling applications in user friendliness, education, creative writing, and beyond the integration of ChatGPT, a sophisticated language model developed by OpenAI, into higher education has sparked considerable interest regarding its impact on university research scholars. This literature review synthesizes current research to elucidate the advantages, challenges, and implications of ChatGPT's adoption in academic research.

## i. Enhancing Research Efficiency

ChatGPT has been recognized for its potential to streamline various aspects of academic research. It assists scholars in generating literature reviews, drafting manuscripts, and providing quick summaries of complex topics, thereby expediting the research process. A comprehensive review highlighted that ChatGPT offers opportunities for assessment innovation, instructional support, and research development support in higher education.

#### ii. Support in Academic Writing

The model aids in improving the quality of academic writing by offering suggestions for structure, coherence, and style. Researchers have utilized ChatGPT to generate introductory sections and abstracts for scientific articles, enhancing clarity and readability. However, concerns have been raised about the ethical implications of AI-generated text in scholarly publishing.

#### iii. Ethical Considerations and Plagiarism

The use of ChatGPT raises ethical questions, particularly regarding authorship and the originality of content. Some journals have implemented policies requiring authors to disclose the use of AI tools and have banned listing ChatGPT as a co-author. There is an ongoing debate about the potential for AI to contribute to plagiarism and the degradation of writing skills among scholars.

#### iv. Impact on Creativity and Critical Thinking

While ChatGPT can assist in generating ideas and content, there is concern that over-reliance on AI may impede the development of critical thinking and creativity among researchers. A study exploring the influence of ChatGPT on academic writing found that some researchers fear it could lead to a decline in writing skills and originality.

#### v. Challenges in Data Accuracy and Hallucinations

Despite its advanced capabilities, ChatGPT is prone to generating information that appears plausible but is incorrect or nonsensical, a phenomenon known as "hallucination." This poses challenges for researchers who may inadvertently incorporate inaccurate information into their work. Experts caution against fully trusting AI outputs without human verification.

vi. Influence on Research Methodologies

The integration of ChatGPT into research practices has the potential to influence methodologies, particularly in data analysis and interpretation. AI can assist in identifying patterns and trends within large datasets, offering new avenues for analysis. However, the reliance on AI-driven insights necessitates a critical evaluation of the methods employed to ensure validity and reliability.

# Educational Implications

In the educational context, ChatGPT serves as a tool for personalized learning, providing immediate feedback and support to students. This has implications for research scholars who are also educators, as it offers new methods for instruction and engagement. Nonetheless, the integration of AI into education requires careful consideration of pedagogical goals and the maintenance of academic integrity.

As ChatGPT continues to evolve, it is imperative for and policies academic institutions to develop guidelines governing its use in research. Training programs should be established to educate scholars on the ethical use of AI tools, emphasizing the importance of human oversight and critical evaluation of AI-generated content. Further research is needed to explore the long-term implications of AI integration in academia and to develop strategies for mitigating potential risks. The adoption of ChatGPT in higher education presents both opportunities and challenges for research scholars. While it offers tools to enhance efficiency and support academic writing, it also raises ethical concerns and potential impacts on critical thinking and creativity. A balanced approach that leverages the benefits of ChatGPT while addressing its limitations is essential for its effective integration into academic research.

#### III. METHODOLOGY

In this study, we aimed to investigate how ChatGPT can assist researchers in conducting research work. To accomplish this objective, we designed a research instrument in the form of a survey. This study will employ a quantitative surveybased research design to assess and compare the usability and efficacy of AI chat bots (ChatGPT) and conventional web searching tools among research scholars at Mahatma Gandhi Kashi Vidyapith (MGKVP).

#### 3.1. Research Design

This research will be conducted using a quantitative survey-based approach to analyze and compare the usability and efficacy of AI chat bots, specifically ChatGPT, against conventional web searching tools in academic research. The study will focus on research scholars at Mahatma Gandhi Kashi Vidyapith (MGKVP) and will provide empirical insights into how these tools are being utilized for research purposes. The survey will assess various aspects such as ease of use, accuracy, relevance of retrieved information, and overall effectiveness of both approaches.

## 3.2. Target Population and Sampling

The primary participants of this study will be research scholars, including MPhil and PhD candidates from different academic disciplines at MGKVP. A **stratified random** 



sampling technique will be adopted to ensure adequate representation across various fields of study. The sample size is expected to include at least 50 research scholars, which will help in achieving statistically significant results. This diverse participation will enable the study to capture a broad range of perspectives and experiences regarding AI-based research tools and traditional search engines.

#### 3.3. Data Collection Method

To collect comprehensive and reliable data, a structured questionnaire will be designed and distributed both online and offline. Google Forms will be utilized for online data collection, while printed copies will be provided to those who prefer physical surveys. The survey will be disseminated via email, WhatsApp groups, and in-person visits to different research departments. The data collection process is expected to take place over a period of four weeks, allowing sufficient time for maximum participation.

#### 3.4. Survey Instrument Structure

The questionnaire will be carefully structured into different sections to capture all relevant aspects of the study. The sections will include:

- i. *Demographic Information:* This section will gather data on the participants' age, academic discipline, level of research, and prior experience with AI chatbots and conventional web search tools.
- ii. *Usability Assessment:* This part will evaluate the ease of use, user interface satisfaction, and learning curve of both AI chat bots and traditional search tools. Responses will be recorded using a Likert Scale (1-5).
- iii. *Efficacy Assessment:* Participants will provide insights on the accuracy and relevance of information retrieved, speed of obtaining answers, and credibility of sources used by AI chat bots and web search tools.
- iv. *Comparative Evaluation:* This section will focus on the preference of participants between AI chat bots and conventional search engines, their effectiveness in different research scenarios, and challenges faced while using both methods.
- v. *Open-ended Questions:* Participants will be encouraged to share their personal experiences, suggestions for improvement, and additional insights on their usage of AI chat bots and conventional search tools.

## IV. DATA ANALYSIS

Once the data has been collected both quantitative and qualitative analysis will be performed to derive meaningful conclusions. Basic statistical calculation been used for deriving the responses.

#### i. Field of Study Distribution

The first part of study consist the generalize information on students background and their preferences As shown in fig.1.0. The majority of respondents belong to Humanities, Social Science, and Commerce & Management. A smaller group identified as "Other." This suggests that the survey covers a diverse academic background, but is primarily focused on these three fields.

*ii. Research & Web Search Usage* 

TABLE 1.0 Research Frequency		
<b>Research Frequency</b>	Number of Respondents	
Daily	16	
Weekly	4	
Monthly	3	

As shown in table1.0 Research Frequency: The majority of respondents (16 individuals) engage in research on a daily basis, while a smaller group conducts research weekly (4 respondents) or monthly (3 respondents). This suggests that frequent research is a common practice among participants.

	TABLE 2.0 Web Search Usage	
Web Search Usage		Percentage of Respondents
	Daily	100%

From table 2.0 Web Search Usage: All respondents (100%) rely on web search daily for academic purposes, highlighting its essential role in their research activities. This indicates that web search tools are a primary and indispensable resource for academic information retrieval.

#### iii. AI Chatbot Usage & Ease of Use

TABLE 3.0 AI Chatbot Usage		
Frequency	Number of Respondents	
Occasionally	16	
Weekly	4	
Daily	3	

As given in table 3.0 AI Chatbot Usage: A majority (16 respondents) use AI chatbots occasionally, while only 4 use them weekly and 3 use them daily. This suggests that AI chatbots are not yet a primary research tool for most respondents

#### iv. Ease of Use (Chatbots)

TABLE 4.0. Ease of Use (Chatbots)		
Rating	Number of Respondents	
Neutral	12	
Very Easy	7	
Difficult	2	

• *Ease of Use (Chatbots):* Most respondents rated AI chatbots as neutral (12 people) or very easy (7 people) to use. However, a few found them difficult (2 people), which might indicate usability issues.

#### V. Web Search Ease of Use & Satisfaction

a. Ease of Use (Web Search)

TABLE 5.0a. E	ase of Use (Web Search)
Rating	Number of Respondents

Rating	Number of Respondents
Easy	17
Somewhat Easy	6



b. Conventional Web Search for Research

TABLE 5.0b. Ease of Use (Web Search)		
Usage Level Number of Responden		
To a great extent	15	
Somewhat	7	

- *Ease of Use (Web):* The majority (17 respondents) rated web search as **easy**, while 6 found it somewhat easy. This suggests that conventional web search is generally user-friendly.
- *Conventional Web Search for Research:* Most respondents rely on web search "to a great extent" (15 people), with only a few stating "somewhat" (7 people).

vi. User Satisfaction with AI Chatbots vs. Web Search

Chatbot UI Satisfaction

TABLE 6. Chatbot UI Satisfaction		
Satisfaction Level	Number of Respondents	
Moderately Satisfied	10	
Moderately Dissatisfied	9	
Neutral	4	

a. Chatbot UI Satisfaction: Responses were mixed—10 respondents were moderately satisfied, 9 were moderately dissatisfied, and 4 were neutral. This indicates room for improvement in chatbot interfaces.

b. Web Search UI Satisfaction

Web Search UI Satisfaction: Most respondents (14) were satisfied, while 5 were moderately satisfied and 3 were neutral. This confirms that web search interfaces generally meet user expectations.

Satisfaction Level	Number of Respondents
Satisfied	14
Moderately Satisfied	5
Neutral	3

c. Ease of Use Ratings (Mean & Standard Deviation)

Tool	Mean Score	Standard Deviation	Interpretation
AI Chatbots	3.61	1.03	Moderately easy, but experiences vary significantly
Web Search	4.00	0.00	Universally easy to use, no variation in responses

d. UI Satisfaction Ratings (Mean & Standard Deviation)

Tool	Mean Score	Standard Deviation	Interpretation
Chatbot UI	2.31	0.48	Moderate dissatisfaction, consistent concerns about usability
Web Search UI	3.25	0.50	Generally satisfied, but some users are neutral

The average ease-of-use rating for AI chatbots is 3.61 on a 5-point scale, with a standard deviation of 1.03. This suggests that users generally find chatbots moderately easy to use, but their experiences vary significantly. While some users may find chatbots intuitive and user-friendly, others struggle with their functionality, indicating inconsistencies in usability. The relatively high standard deviation reflects diverse user opinions, meaning that chatbots are not equally accessible or efficient for everyone.

While Web search tools received a mean score of 4.00 with a standard deviation of 0.00, meaning every respondent unanimously rated them as "Easy" to use. This highlights that web search engines are universally accessible, familiar, and effortless to navigate, making them a preferred tool for academic research. The absence of variation suggests that users have consistent experiences with search engines, reinforcing their reliability as a research tool. With a mean score of 2.31 and a standard deviation of 0.48, users expressed moderate dissatisfaction with chatbot interfaces. The lower mean score suggests that chatbot UI design may be less intuitive, less visually appealing, or harder to navigate compared to web search tools. The relatively low standard deviation indicates that most respondents share similar concerns about chatbot interfaces, highlighting the need for improvements in user experience, design, and accessibility. The mean satisfaction rating for web search interfaces is 3.25, with a standard deviation of 0.50. This indicates that users are generally satisfied with web search UI, though some respondents have a more neutral stance. The slightly higher mean compared to chatbots suggests that web search platforms offer a more user-friendly and familiar interface, though there is still some room for enhancement.

# V. KEY FINDINGS

- Web search tools are perceived as universally easy to use, with all respondents rating them as "Easy" and no reported usability challenges. This reinforces their role as the go-to tool for research and information retrieval.
- AI chatbots have a mixed reception—while some users find them intuitive, others struggle with their usability, leading to inconsistent experiences. This suggests that chatbot design, interaction quality, or learning curve could be barriers to adoption.
- Chatbot UI satisfaction is noticeably lower than web search UI satisfaction, indicating that chatbot interfaces may need redesigning or optimization to enhance user experience. Factors such as navigation, clarity, and responsiveness could be improved.

# VII. CONCLUSION

The analysis highlights a clear preference for web search tools over AI chatbots in academic research due to their ease of use, reliability, and user-friendly interface. Respondents unanimously rated web search as easy to use, with no variation in opinions, making it the primary tool for information retrieval. Additionally, satisfaction with web search interfaces is notably higher compared to AI chatbots, reinforcing their widespread acceptance.

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Conversely, AI chatbots received mixed feedback. While some users found them easy to use, others encountered challenges, leading to inconsistent user experiences. The lower satisfaction with chatbot interfaces suggests a need for improvements in design, usability, and overall user interaction to enhance adoption and efficiency. Overall, the findings indicate that while AI chatbots hold potential as research tools, they must be optimized to improve usability and interface satisfaction. Addressing these challenges could help increase their effectiveness and adoption in academic settings, complementing traditional web search methods.

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