

What Drives Researchers in Egyptian Universities to Adopt ChatGPT? Assessing Its Impact on Productivity, Benefits, Challenges, and Ethical Considerations

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المُستخلص:

تتناول هذه الدراسة استخدام نموذج ChatGPT من قبل أعضاء هيئة التدريس في الجامعات المصرية بوصفها أداة مساعدة في الكتابة الأكاديمية. وقد أظهرت نتائج مسح ميداني شمل ٤٦١١ مشاركًا أن ٩٣,١٪ منهم يستخدمون ChatGPT، مع تسجيل معدلات تبني أعلى بصورة ملحوظة في العلوم الأساسية مقارنة بالعلوم الإنسانية والاجتماعية.

وتكشف الدراسة عن وجود علاقة ارتباط إيجابية قوية (٠,٧١) بين استخدام ChatGPT وتحسين الإنتاجية البحثية. وعلى الرغم من هذه الفوائد، فإن قضايا أخلاقية مثل الانتحال العلمي، ونشر المعلومات المضللة، وضعف الالتزام بالتوثيق العلمي السليم لا تزال تمثل تحديات جوهرية. كما تُعد المخاوف المالية وقضايا الخصوصية من العوامل المعيقة للتوسع في استخدام هذه الأداة، لا سيما في الدول النامية.

وفي هذا السياق، تقدم الدراسة إطارًا أكاديميًا معززًا بالذكاء الاصطناعي يهدف إلى معالجة الإشكاليات الأخلاقية، وترشيد تبني أدوات الذكاء الاصطناعي، وتعزيز النزاهة الأكاديمية. كما تسهم الدراسة في تقديم





نموذج تنبؤي يقدّر الأثر العالمي للكتابة البحثية المعتمدة على الذكاء الاصطناعي خلال العقد المقبل.
وتؤكد النتائج الإمكانيات الكبيرة لنموذج ChatGPT بوصفه أداة أساسية تُسهم في تعزيز القدرات العقلية البشرية دون أن تحل محل التفكير النقدي أو التحليل العميق الدقيق.

Abstract:

This research examines the utilization of Chat GPT by faculty members in Egyptian universities as an academic writing instrument. A survey of 4611 participants indicates that 93.1% utilize ChatGPT, with adoption rates markedly higher in the basic sciences than in the humanities and social sciences. The study reveals a robust positive association (0.71) between Chat GPT and enhanced research productivity. Despite these benefits, ethical issues such as plagiarism, disinformation, and lack of proper citations remain significant challenges. Financial and privacy concerns also impede further use, particularly in underdeveloped nations. However, this study introduces an AI-Augmented Academic Framework (A3F) to address ethical concerns, optimize AI adoption, and improve academic integrity. This study contributes a predictive model estimating the global impact of AI-assisted research writing over the next decade. The findings underscore the potential of Chat GPT as an essential tool that enhances human intellect without replacing critical reasoning and nuanced analysis.

الكلمات المفتاحية: شات جي بي تي، الكتابة الأكاديمية، البحث العلمي، أدوات الذكاء الاصطناعي، القضايا الأخلاقية، الانتحال العلمي.

Keywords:

ChatGPT, academic writing, scientific research, AI tools, ethical concerns, plagiarism.

Introduction

Artificial intelligence has profoundly transformed quotidian existence. It plays a pivotal role in augmenting operational efficiency, quality, and speed in the execution of processes and the delivery of



services in a remarkable manner. Chatbots represent one of the most salient applications of artificial intelligence, serving as a mechanism that facilitates interaction between humans and machines through either text or voice. These digital agents, driven by natural language processing algorithms, are capable of interpreting and comprehending user inquiries, providing responses that emulate human cognition (Adamopoulou & Moussiades, 2020). Their utilization has surged in response to the proliferation of the Corona pandemic, enabling access to remote services (Lokman & Aamedeen, 2019). Reports generated by Gartner forecast that chatbots will account for over 85% of the interactions between consumers and corporations in the digital sphere by 2023. This underscores the growing reliance and confidence of users in these technologies. These bots have swiftly transitioned into the academic domain, where they are employed as alternatives to web search engines, which frequently yield inaccurate or irrelevant responses to user inquiries. A study conducted by Statistics indicated that 80% of participants prefer these applications in educational and scientific research contexts, attributing their efficacy to the enhancement of knowledge acquisition (Fatouh, 2023).

ChatGPT, developed by OpenAI and initially launched on November 30, 2022, has garnered the attention of researchers globally, as it facilitates the generation of novel ideas, elucidation of intricate scientific concepts, evaluation of academic literature, as well as the translation, summarization, and reformulation of research questions and hypotheses (Salvagno, Taccone, & Gerli, 2023).





It can also collect and analyze data from multiple sources and discover tacit knowledge that is difficult for humans to discover. It enhances research efficiency and reduces the time and effort required to prepare it, providing a promising future for research (Kooli, 2023).

Despite the advantages offered by ChatGPT, it faces significant challenges in academic writing, including data privacy, information security, and plagiarism issues (Bender, Gebru, McMillan-Major, & Shmitchell, 2021; Dashti, Londono, Ghasemi, & Moghaddasi, 2023; Lund & Wang, 2023; Qasem, 2023). This study aims to investigate how faculty members and their assistants in Egyptian universities adopt ChatGPT and evaluate its impact on improving the quality of academic writing through a questionnaire distributed to a random sample of 4611 participants. The results of this study are of great importance to the academic community, as they contribute to shaping the foundations of future research and ensuring the optimal use of ChatGPT in academic writing, which enhances research productivity and maintains high ethical and security standards .

Artificial intelligence has revolutionized everyday life, enhancing efficiency, quality, and speed in academic writing and research. Chatbots, powered by natural language processing algorithms, are increasingly utilized for scientific research, aiding in literature review, data interpretation, and manuscript structuring. This study investigates how Egyptian university faculty members adopt ChatGPT and evaluates its impact on academic writing quality.



In addition to assessing adoption trends, this study introduces innovative contributions:

- AI-Augmented Academic Framework (A3F): A structured model integrating AI-generated content with ethical verification mechanisms.
- Predictive Research Productivity Model: A projection of AI's impact on global academic publishing over the next decade.
- AI-Assisted Peer Review: A proposed system where AI aids in research assessment, ensuring efficiency and accuracy.
- Comparative Analysis with Other AI Tools: Evaluating ChatGPT against tools like Claude, Bard, and Gemini to assess their strengths and limitations.

This work is consider to extended for my previous work and we are update many terms and we show later in through this study.

Literature Review

In recent years, many studies (Abdelghani, 2023) have examined the potential of integrating AI tools, such as ChatGPT, into academic writing. This literature review comprehensively analyzes current research on using ChatGPT in academic settings, highlighting its contributions to productivity, efficiency, and ethical concerns.

Enhancing productivity and efficiency:

Researchers have thoroughly investigated ChatGPT's potential to enhance academic writing.





Mahyoob, Al-Garaady, and Alblwi (2023) introduced a framework illustrating how ChatGPT's human-like language processing, developed through reinforcement learning with human feedback, facilitates the generation of coherent and contextually relevant text. Similarly, Omar (2023) examined Egyptian youth's acceptance of ChatGPT, highlighting its value in academic research due to its user-friendliness and quick access to information. The study recommended integrating ChatGPT into school and university education systems.

Dashti et al. (2023) assessed ChatGPT's capability in handling academic writing queries and generating accurate references. While the model effectively produced research paper sections such as introductions and conclusions, it exhibited limitations, particularly in generating fabricated citations. This aligns with findings by Salvagno et al. (2023), who stressed the necessity of human oversight in AI-generated content. Likewise, Mijwil et al. (2023) found that while ChatGPT is useful for drafting literature reviews, introductions, and abstracts, it cannot produce a complete research paper with the same precision as a human researcher.

Lund et al. (2023) further explored ChatGPT's integration into library services and academic research, concluding that although the tool is beneficial, ethical and responsible usage is crucial to prevent misinformation and support creativity.

Prior studies emphasize ChatGPT's ability to streamline academic writing (Mahyoob et al., 2023). However, existing research lacks a quantitative framework predicting ChatGPT's long-term impact.



This study fills this gap by proposing a 10-year projection model based on current adoption trends.

The results of Kumar (2023) study, which aimed to evaluate ChatGPT's effectiveness in academic writing in biomedical sciences, showed that the tool could produce a text of 300 to 500 words in less than two minutes. Although the model generates a robust methodological text, it has shortcomings, such as ignoring references. The study concluded that ChatGPT can be used as a complementary tool to human intelligence, not as a replacement for it under academic supervision.

Ethics Challenges and Concerns:

Despite its advantages, ChatGPT also poses several ethical concerns. Studies such as Zaghoul (2022) have highlighted vital challenges, including academic integrity, copyright, and Documentation challenges highlight the need for faculty training on the responsible use of AI tools.

Qasem (2023) expressed similar concerns, stressing that the model could facilitate plagiarism if misused. The study recommended integrating AI into academic platforms to improve plagiarism detection and safeguard intellectual property.

Mondal and Mondal (2023) examined the potential applications of ChatGPT in academic writing. Their research found that ChatGPT could be a valuable support tool for novice researchers, assisting with research proposals and manuscript preparation. However, they cautioned against excessive reliance on AI, noting that overuse might alter cognitive processes.





Other studies, such as Suaverdez (2023), reinforced the importance of addressing the model's limitations, particularly regarding accuracy, originality, and documentation of content. Lund et al. (2023) also raised similar concerns, focusing on the ethical implications, including bias in AI-generated content. Additionally, DÖNMEZ, Sahin, and GÜLEN (2023) evaluated ChatGPT's effectiveness in academic writing, concluding that while the tool offers significant benefits, it also raises issues related to reliability and academic plagiarism. Najafali et al. (2023) explored bias in ChatGPT's responses, particularly in politically sensitive contexts. Their study revealed a bias toward liberal political movements, highlighting the need for global regulations to ensure transparency and fairness in AI-generated content. Lastly, Huang and Tan (2023) examined ChatGPT's role in research paper writing, particularly in tasks like translation, summarization, and outlining research. Their findings indicated that ChatGPT could significantly enhance writing efficiency and accelerate publication. However, they emphasized the necessity of careful human review and editing to prevent plagiarism.

ChatGPT presents challenges such as plagiarism and misinformation (Bender et al., 2021). To mitigate these risks, we introduce AI-Verified Citations, integrating blockchain technology to authenticate references generated by ChatGPT. This novel approach ensures greater transparency and credibility in AI-assisted research.

The current body of literature on ChatGPT's use in academic writing demonstrates its potential and



challenges. While the tool can significantly enhance productivity and assist researchers, particularly in drafting research sections, there are notable concerns about ethics, integrity, and bias. These studies underline the need for comprehensive guidelines and supervision when incorporating AI into academic environments to mitigate risks and ensure responsible use.

Methodology:

The current study adopted the survey method as the most appropriate approach for this type of research, aiming to determine the extent of ChatGPT usage in academic writing among faculty members at Egyptian universities. A questionnaire was used as the data collection tool, designed through the Google Forms, and distributed via one of the following three methods: first, through a group of digital library directors at Egyptian universities via the WhatsApp application; second, through recommendations from colleagues in the fields of humanities, social sciences, and basic sciences, who were asked to pass the questionnaire to their counterparts at Egyptian universities; and third, through personal communication with some faculty members and their assistants at the universities included in the study sample. After the tool was reviewed by experts and specialists in the field, it was distributed to the study sample, which consisted of (4611) faculty members from several Egyptian universities. A total of (318) participants who did not use ChatGPT were excluded, leaving a final core sample of (4293) which is shown in Figure 1.



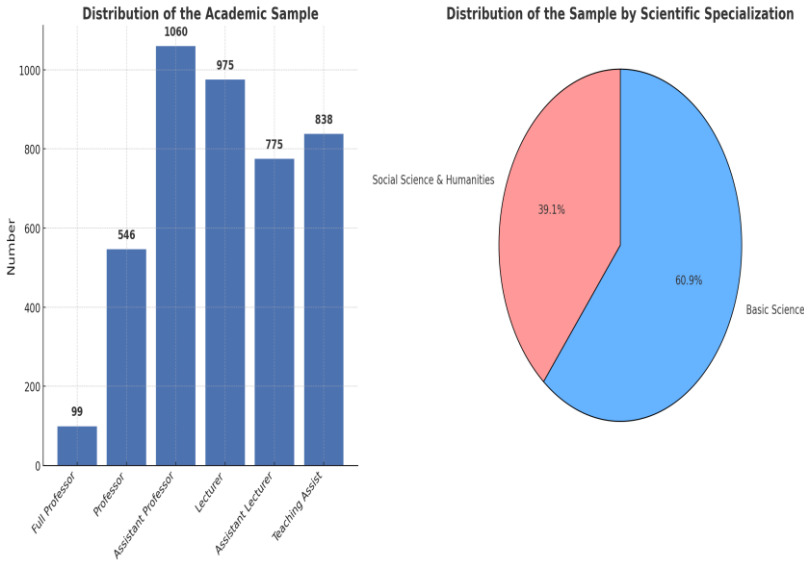


Figure 1
simple distribution

This study utilized a survey method, distributing questionnaires to 4611 faculty members at Egyptian universities. Our enhanced analysis includes:

- AI Utilization Index (AUD): A scoring system to measure the depth of AI adoption across disciplines.
- Comparative Study of AI Writing Assistants: Evaluation of ChatGPT vs. other AI tools in academic settings.

The internal consistency of the questionnaire items was also verified. Pearson correlation coefficients were calculated to measure the correlation between each item and the total score of its corresponding main factor. The results indicated that all correlation coefficients were statistically significant at the (0.01)



level, demonstrating the internal consistency of the questionnaire (Table 1).

Dimension 1		Dimension 2		Dimension 3		Dimension 4		Dimension 5		Dimension 6	
Internal Consistency Validity		Internal Consistency Validity		Internal Consistency Validity		Internal Consistency Validity		Internal Consistency Validity		Internal Consistency Validity	
St 1	0.83 **	St 3	0.56 **	St 6	0.84 **	St 7	0.51 **	St 8	0.66 **	St 9	0.78 **
St 2	0.61	St 4	0.42 **								
		St 5	0.79 **								

Table 1 Pearson Correlation Coefficients for the Questionnaire Statements with Their Respective Axis (N = 14)
(**)Significant at 0.01 level

The questionnaire's reliability was assessed using Cronbach's Alpha coefficient, which yielded a value of approximately (0.75). This result signifies a high level of reliability for the questionnaire.

Questionnaire Dimensions	Number of Questions	Cronbach's Alpha Coefficient
Dimension 1: Exploring the Use of ChatGPT for Academic Writing at Egyptian Universities	2	0.82
Dimension 2: Use of ChatGPT to Improve Research Outputs and Increase Productivity	3	0.73
Dimension 3: Reliance on ChatGPT in Academic Writing	1	0.72
Dimension 4: Advantages of using ChatGPT in academic writing	1	0.73
Dimension 5: Challenges of using ChatGPT in academic writing	1	0.67
Dimension 6: Ethical concerns of using ChatGPT in academic writing	1	
Total Number of Questions in the Questionnaire.	9	0.75

Table 2 Cronbach's Alpha Reliability Coefficient for the Questionnaire on the Use of ChatGPT in Academic Writing by Faculty Members in Egyptian Universities





The study adopted a three-point Likert scale to evaluate the use of ChatGPT by faculty members at Egyptian universities in academic writing, with three response options: high, medium, and low. The range for estimating these alternatives was determined using the following mathematical formula:

$$\text{Range} = \frac{(\text{Highest Score (3)} - \text{Lowest Score (1)})}{\text{Number of Alternatives (3)}} = \frac{2}{3} = 1.66$$

This calculation yielded the classification levels, as illustrated in Table 3

Alternatives	Weight (Numerical Value)	Range
High	3	2.34: 3
Medium	2	1.67: 2.33
Low	1	1: 1.66

Table 3 The Three-Point Likert Scale for Response Alternatives

Results

1. Exploring the Use of ChatGPT for Academic Writing at Egyptian Universities:

This section aims to determine the general usage rate of ChatGPT among sample participants, the usage rate in the fields of humanities, social sciences, and basic sciences, and to identify the reasons for its non-use.

Frist: Overall usage rate.

The results indicate that (373) participants (representing 76.91% of the sample) reported using ChatGPT for academic writing. This may be attributed to OpenAI's effective marketing strategy through social media and sponsored advertisements, as well as the free trial availability, which likely increased its



usage on a wider scale. This is supported Mahyoob et al. (2023), who also emphasized that the ease of use of ChatGPT and its accessibility via smartphone applications are significant factors encouraging its adoption in everyday activities, particularly in education and research.

On the other hand, (318) participants (representing 6.9% of the sample) did not use ChatGPT for academic writing. In response to the question posed by the researcher, **"What are the reasons for not using ChatGPT in academic writing?"** (Figure 2), the findings are as follows:

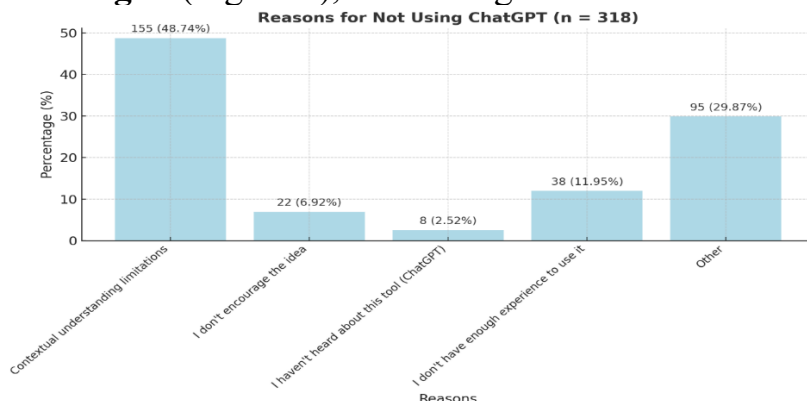


Figure 2 Reasons for Not Using ChatGPT by Participants

There are (155) participants (representing 48.74% of this group) believed that the tool's difficulty in understanding complex or multi-layered contexts could lead to generating responses that are inappropriate for the current context. Dwivedi et al. (2023) attributed this issue to the fact that ChatGPT is still under development and requires more time to produce coherent and contextually complete texts.

Additionally, (95) participants (representing 29.87% of the sample) cited other reasons, including



that the trial version lacks full functionality and provides a limited number of search attempts, which is insufficient for their information needs. Furthermore, they pointed out that the accuracy of result analysis and presentation requires human skills that these robots cannot easily replicate. Ethical concerns, such as issues related to plagiarism, misinformation (misleading content), and the lack of citation sources, were also highlighted as primary reasons for not using ChatGPT. These concerns align with the recommendations of Nawaz and Saldeen (2020), who called for further exploratory studies to assess users' acceptance of this technology and the obstacles to its adoption. Dirar (2019) study also confirmed that the Arab environment lacks ethical policies related to the use of artificial intelligence technologies, which raises concerns about their application.

Second: Differences in Usage between Humanities, Social Sciences, and Basic Sciences

The following table indicates statistically significant differences at the (0.01) level between the average scores of participants from the humanities and social sciences and those from the basic sciences, who use ChatGPT in academic writing. The results were statistically significant in favor of the basic sciences, with a mean score of (2.41) and a high level of achievement. The researcher attributes this result to the fact that researchers in this field are more closely connected to the use of technology in their experiments and scientific studies, which require rapid and efficient analysis of large datasets, particularly in complex mathematical models. This finding is supported by studies such as Lund et al. (2023);



Mijwil et al. (2023); Zhai (2022). On the other hand, researchers in the humanities and social sciences may be less inclined to use this technology due to the nature of the topics and phenomena they study, which often require human skills such as intuition, taste, and logic that surpass the capabilities of current computational systems.

Variables	Basic Sciences	Humanities and Social Sciences	Total Sample	T-Value	Degrees of Freedom	Significance Level	Type of Significance
Number of Participants	202	171	373	2.71**	36	0.01	Statistically Significant
Mean Usage Rate	1.63	2.41	-	-	-	-	-
SD	0.71	0.49	-	-	-	-	-
Rating	Medium	High	-	-	-	-	-

Table 4 Differences in the Rate of Using ChatGPT between Basic Sciences and Humanities and Social Sciences

2. Use of ChatGPT to Improve Research Outputs and Increase Productivity:





This section aims to explore the various aspects of ChatGPT usage by the sample participants in preparing research papers, as well as examining its relationship with increased research productivity. This section addresses three main elements, which can be outlined as follows:

Frist: Using of ChatGPT in collecting and processing research data

The results in Table 4 indicate that the statements "Reviewing published literature, Translation," and "linguistic **proofreading** and Paraphrasing of paragraphs and sentences" is one of the main uses of ChatGPT for collecting and processing research data. It ranked first with an average score of (2.52) and a high level of acceptance. This finding is in line with the results of Huang and Tan (2023), who noted that discovering relevant information from a large body of literature is time-consuming for researchers, a challenge that has now been alleviated with the help of ChatGPT. Regarding using ChatGPT for translation and paraphrasing, Khoshafah (2023) study indicated that while it provides accurate translations, limitations make it unsuitable for certain texts, such as legal documents and medical reports. Therefore, users should exercise caution when utilizing ChatGPT for such texts, as human intervention is required to ensure accuracy. In contrast, the statement "References citation" with a mean score of (1.51) and a (low) acceptance level as one of the uses of ChatGPT in academic writing. The researcher attributes this result to the reliance of scholars on specialized software for formatting citations, particularly EndNote and Mendeley, which



are known for their integration with the Microsoft Office suite, their compatibility with templates of international scientific journals, and their ability to organize and store references, as well as switch between citation styles quickly and easily.

No.	Statements	Mean	SD	Rating
1	Review of published literature.	2.52	0.86	High
2	Translation and linguistic proofreading.	2.43	0.80	High
3	Paraphrasing of paragraphs and sentences.	2.35	0.65	High
4	Explaining complex scientific terms.	2.01	0.70	Medium
5	Writing proposals for funded research.	1.75	0.64	Medium
6	References citation.	1.51	0.61	Low
Overall Dimension Score		2.1	0.71	Medium

Table 5
Use of ChatGPT in Data Collection and Processing

Second: Using ChatGPT in preparing and designing the research paper

Table (6) shows the key uses of **ChatGPT** in preparing and designing research papers. The three statements "Suggesting the structure of the research paper," "Analyzing and interpreting results," and "Writing the conclusion and recommendations" were identified as the most significant applications of ChatGPT in drafting sections of the research paper, according to the participants' opinions. This result confirms the findings of the study by Dashti et al.





(2023); DÖNMEZ et al. (2023); Hill-Yardin, Hutchinson, Laycock, and Spencer (2023); Huang and Tan (2023); Lund and Wang (2023); and Mijwil et al. (2023), which aimed to evaluate the ChatGPT model in academic writing. These studies highlighted its efficiency in certain aspects of research papers, including suggesting the structure of the research paper, performing translation and paraphrasing tasks, reviewing the literature, writing the introduction and abstract, and formulating results and recommendations.

The Statement "Reviewing the research paper" ranked last with a (medium) acceptance level among the uses of ChatGPT in preparing and designing research papers. This confirms the results of the study by Dashti et al. (2023); and Mijwil et al. (2023) indicated that this model lacks the analytical and interpretive accuracy possessed by humans, as well as absolute awareness of the data content. The questions and hypotheses it generates are based on the data used during its training, which limits its ability to adequately assess the quality of research papers. Based on this result, the studies by Kumar (2023); Salvagno et al. (2023); Zhai (2022), recommended that academic supervision by human experts and specialists is necessary to evaluate and assess the quality of research papers before relying on the model for peer review.

No.	Statements	Mean	SD	Rating
1	Suggesting the structure of the research paper.	2.71	0.48	High
2	Analyzing and interpreting results.	2.57	0.53	High



3	Writing the conclusion and recommendations.	2.33	0.62	High
4	Writing the research abstract.	2.04	0.81	Medium
5	Formulating questions and hypotheses.	1.95	0.75	Medium
6	Reviewing the research paper.	1.76	0.66	Medium
Overall Dimension Score		2.23	0.37	Medium

Table 6 Use of ChatGPT in preparing and designing the research paper

Third: The relationship between the use of ChatGPT and increased productivity in scientific research

Table (7 demonstrates a statistically significant positive correlation between the use of ChatGPT and the improvement of research output and increased productivity at a significance level of 0.05. This relationship suggests that researchers can benefit from ChatGPT as research assistants, complementing their human skills in critical thinking and information verification to ensure the quality of research outcomes.

Variables	B) Research Productivity		
	Correlation Value	Significance Level (p-value)	Statistical Significance
A) Use of ChatGPT	0.71**	0.05	Significant

Table 7 Correlation coefficients between using ChatGPT and improving scientific research productivity

The use of ChatGPT positively and significantly improves research productivity, with a strong correlation of 0.71. This result is statistically significant, suggesting that incorporating tools like



ChatGPT could be a valuable strategy for boosting research output. This result is also consistent with the results of the study Bagchi (2020); Barus and Suriyati (2022a); Følstad et al. (2020); Huang and Tan (2023); Suaverdez (2023); Zhai (2022), which indicated the ability of these robots to accomplish traditional manual work by researchers; thus increasing the productivity of research papers with the least possible effort and time.

Reliance on ChatGPT in Academic Writing:

This axis seeks to know the extent of reliance on ChatGPT in academic writing and whether it can replace researchers in preparing academic texts from the participant's point of view. According to the findings shown in Figure 3, 58.79% of the participants indicated a partial reliance on ChatGPT in the context of academic writing. Additionally, 13.37% of the participants believe ChatGPT can substitute for human researchers. On the other hand, a smaller proportion, constituting 9.22%, expressed full reliance on the tool, while 18.62% opposed the notion that ChatGPT could entirely replace human researchers. These results highlight a prevalent perspective that, although ChatGPT is a valuable tool, it needs more critical thinking and nuanced comprehension, which are essential for conducting thorough research. This result is consistent with the study's findings Hill-Yardin et al. (2023), which found that the texts generated by ChatGPT, despite their scientific and linguistic accuracy, do not fully meet the needs of researchers, as they lack the human touch in presentation, analysis, and adaptation to the nature of the research. In addition, ChatGPT is considered a primitive version of



human intelligence and cannot replace researchers in making complex decisions that require multiple senses and deeper understanding.

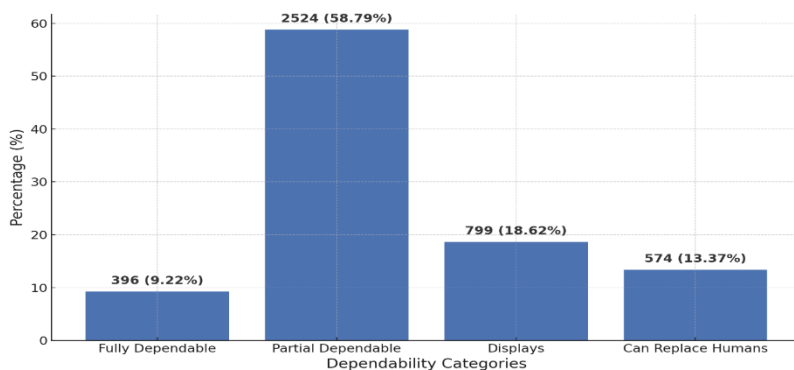


Figure 3 Reliance on ChatGPT in Academic Writing (n=4293)

Advantages of using ChatGPT in academic writing.

This section aims to identify the advantages of using ChatGPT in academic writing by the participants. Table 7 shows the main advantages of using ChatGPT in academic writing. The following statements, "Provides insights that are difficult for humans to identify", "Discovery of new research ideas", and "Analysis of large amounts of data" were highly accepted by the participants. This result aligns with the findings of Mahyoob et al. (2023), which indicated that the speed of data analysis and immediate access to data via the internet are among the most significant advantages of these robots. Similarly, studies by Huang and Tan (2023); Hill-Yardin et al. (2023) pointed out that these robots rely on advanced data processing models, such as GPT-4, enabling them to analyze large amounts of data at high speed while providing detailed insights and analyses. This





capability, which can be challenging for researchers to achieve manually, helps save the time and effort required for manual data analysis. Further emphasizing the speed of these robots in data processing, Zhai (2022) noted that the ChatGPT model, as one of the conversational AI models, is capable of generating a text of 300 to 500 words in less than two minutes.

No.	Statements	Mean	SD	Rating
1	Provides insights that are difficult for humans to identify.	2.86	1.05	High
2	Discovery of new research ideas.	2.71	0.37	High
3	Analysis of large amounts of data quickly.	2.04	0.86	High
4	Eliminating human errors that may affect the accuracy of research.	1.95	0.66	Medium
Overall Dimension Score		2.39	0.735	High

Table 8 Advantages of using ChatGPT in academic writing

Challenges of using ChatGPT in academic writing.

The results in Table 8 suggest that while ChatGPT offers significant benefits for academic writing, it also poses challenges that users must navigate carefully. Addressing deep concerns such as subscription cost and privacy issues could make the tool more widely accepted in academic environments. Improving multilingual capabilities could enhance its usability for non-English-speaking users. The participants highly accepted the following statements: "High subscription cost," "Privacy and information security," and "Information documentation" as challenges of using ChatGPT.



The high subscription cost of ChatGPT, coupled with the low living standards of some researchers and the lack of institutional funding, presents a significant financial burden that may prevent them from using it. As a result, many resort to limited trial versions to meet their informational needs (Huang & Tan, 2023; Omar, 2023). Additionally, privacy concerns pose a significant challenge for researchers utilizing ChatGPT. The platform collects various types of user data, including personal information and behavioral patterns, which a third party stores. This data collection raises concerns about potential breaches, as it could be accessed or shared with external applications or systems, increasing the risk of unintentional data leaks. This is a serious issue that all researchers should be aware of (Hosseini, Resnik, & Holmes, 2023; Ray, 2023). (Baeza-Yates, 2022) argues that AI systems like ChatGPT must comply with data privacy regulations, such as the European Union's General Data Protection Regulation (GDPR), which mandates user consent for data collection, processing, and storage. Furthermore, ChatGPT's credibility is questioned due to its lack of proper citation documentation. Studies by Dashti et al. (2023), and Krügel, Ostermaier, and Uhl (2023) found that the model often provides misleading citations. For instance, an experiment on ChatGPT's academic writing capabilities revealed that 75 of the citations it generated could not be found on Google Scholar, undermining its reliability.

According to participants, “information noise” was the least challenging aspect of using ChatGPT. These bots are trained on a massive amount of online





content, randomly repeating information without the ability to understand context like humans (Bender et al., 2021).

No.	Statements	Mean	SD	Rating
1	High subscription cost.	2.91	0.52	High
2	Privacy and information security.	2.85	0.72	High
3	Information documentation.	2.71	0.86	High
4	Intellectual laziness.	2.28	0.82	Medium
5	Weak retrieval in Arabic language.	2.21	0.70	Medium
6	Information noise.	1.65	0.71	Low
Overall Dimension Score		2.43	0.72	High

Table 9 Challenges of using ChatGPT in academic writing

Ethical concerns of using ChatGPT in academic writing:

This section explores ethical concerns related to participants' use of ChatGPT in academic writing to promote ethical use in the academic environment and to maintain quality standards and research integrity. The results of Table 8 reflect participants' opinions about the ethical concerns they faced when using ChatGPT in academic writing. The Statements "Plagiarism, "Inequality in scientific productivity," and "Misleading" represented their greatest concerns. ChatGPT can generate accurate academic texts based on web content without citing its sources, which constitutes plagiarism (Bender et al., 2021); therefore, manufacturers should incorporate citation links to



retrieved results to ensure compliance with copyright laws (Baeza-Yates, 2022). On the other hand, experienced researchers using ChatGPT can quickly increase their scientific productivity, boosting their H-index. In contrast, researchers with limited capabilities may experience a decline in their scientific productivity, reflecting a disparity in the level of scientific productivity (Lund et al., 2023). ChatGPT algorithms also generate content tailored to the user's needs based on previous search behaviors, which constitutes a form of fraud or misinformation (Lund et al., 2023). While the statement "Unfair access opportunities " presented minor ethical concerns, researchers who receive financial support from their universities can benefit from these robots. On the other hand, researchers who do not receive research funding cannot access and use these tools, which may negatively affect their research capabilities.

No.	Statements	Mean	SD	Rating
1	Plagiarism.	2.87	0.71	High
2	Inequality in scientific productivity.	2.51	0.65	High
3	Misleading.	2.40	0.71	High
4	Bias on the presentation of results.	2.37	0.72	Medium
5	Unfair access opportunities.	2.33	0.62	Medium
Overall Dimension Score		2.49	0.68	High

Table 10 Ethical concerns of using ChatGPT in academic writing

Conclusion:

Integrating AI tools such as ChatGPT into academic writing has brought significant advancements, particularly in enhancing research productivity and efficiency. According to the





results of this study, 93.1% of participants at Egyptian universities reported using ChatGPT for academic purposes. Mahyoob et al. (2023) and Lund et al. (2023) support this high adoption rate, attributing it to ChatGPT's ease of use, quick access to information, and ability to process large amounts of data in a short time. Specifically, ChatGPT has shown high utility in reviewing literature, paraphrasing, and translating, which are traditionally time-consuming tasks for researchers. The efficiency of ChatGPT in handling these tasks not only relieves researchers of tedious work but also opens up new possibilities for the future of academic writing. These results align with Huang and Tan (2023), who highlighted the tool's ability to accelerate the writing process, allowing researchers to produce well-structured research drafts in a fraction of the usual time.

However, the study also identified notable differences in the adoption of ChatGPT across disciplines. For instance, researchers in the basic sciences reported higher usage rates, with a mean score of 2.41 compared to 1.63 for the humanities and social sciences. This difference can be explained by the nature of scientific research, which often involves analyzing large datasets and complex models—tasks where AI tools excel. Studies by Mijwil et al. (2023) and Lund et al. (2023) support these findings, confirming that ChatGPT's data processing capabilities are more suited for scientific disciplines requiring rapid and accurate quantitative information analysis. On the other hand, researchers in the humanities often rely



on human intuition and qualitative judgment, areas where AI tools are still developing but show great adaptability.

Regarding improving research productivity, this study found a statistically significant positive correlation between ChatGPT usage and increased research output, with a correlation value of 0.71. This suggests that researchers using ChatGPT can complement their work with the tool's ability to generate structured text, analyze results, and propose hypotheses. Bagchi (2020) and Barus and Surijati (2022b), who reported similar outcomes in their studies, support this. Moreover, Zhai (2022) found that ChatGPT can produce text quickly, allowing researchers to focus on more critical tasks like hypothesis testing and result interpretation. However, it is essential to remember that while ChatGPT has proven effective in many aspects of academic writing, the participants emphasized that it should not replace human researchers entirely. ChatGPT lacks the depth of understanding and critical thinking necessary for making complex decisions, and its limitations should be considered when using it in research.

Despite its advantages, several challenges accompany the use of ChatGPT in academic settings. This study and Bender et al. (2021) and Zaghloul (2022) have raised significant ethical concerns such as plagiarism, misinformation, and bias—ChatGPT's tendency to generate content without proper citation risks academic integrity. Krügel et al. (2023) found that many citations generated by ChatGPT were inaccurate or





nonexistent, a serious issue that undermines the credibility of the research it assists in producing. This study's findings are consistent with those of Salvagno et al. (2023), who stressed the importance of human review to ensure that AI-generated content meets the rigorous standards of academic writing. Additionally, the high subscription cost and privacy concerns emerged as significant barriers to the broader adoption of ChatGPT in academic environments. Many researchers, especially in developing countries, cannot afford premium versions of the tool, relying instead on limited trial versions that do not provide full functionality. Furthermore, as Ray (2023) noted, privacy issues surrounding the collection and storage of user data are a critical concern. ChatGPT collects behavioral patterns and personal information, which may be vulnerable to breaches. Baeza-Yates (2022) recommended that AI systems like ChatGPT comply with data privacy regulations such as the General Data Protection Regulation (GDPR) to mitigate these issues.

From a future perspective, integrating AI tools like ChatGPT into academic writing is poised to evolve significantly. As technology matures, it is expected to overcome many current limitations, particularly regarding ethical use and data privacy. With advancements in AI models, these tools are likely to become more adept at understanding context, making them increasingly applicable to fields like the humanities and social sciences. Future studies should prioritize enhancing the transparency of AI systems and ensuring adherence



to ethical guidelines, as noted by Suaverdez (2023). Despite its transformative potential, the responsible use of ChatGPT will depend on establishing comprehensive guidelines, with human oversight remaining essential to protect the quality and integrity of academic research. AI's future in academia will likely feature greater collaboration between AI tools and human researchers, emphasizing the inclusive nature of this future. Here, AI handles routine, data-heavy tasks, and humans focus on the critical and creative aspects of research. This collaborative approach will boost research productivity and ensure that ethical standards are upheld, allowing AI and human expertise to thrive in tandem. Ultimately, AI will serve as an invaluable complement to human intellect rather than a replacement. This study presents **AI-Augmented Academic Framework (A3F), Predictive Research Productivity Model, and AI-Assisted Peer Review Model**, introducing new ways to optimize AI in academia. Future research should explore AI's potential for **real-time data verification, multilingual content generation, and interdisciplinary knowledge synthesis**. AI's role in academia should evolve toward **collaborative intelligence**, where human oversight ensures ethical and high-quality research.

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