

## Ethical Considerations Regarding The Use Of Artificial Intelligence Tools In Research And Publication

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### ABSTRACT

Artificial Intelligence (AI) has become integral to scientific research, offering unprecedented capabilities in data analysis, predictive modeling, and literature review. This article explores the multifaceted impact of AI on research methodologies, academic discourse, and ethical considerations. The integration of AI in scientific investigation streamlines data collection, expedites analytical procedures, and facilitates predictive modeling in fields such as biomedicine and social sciences. However, the ethical implications of AI in academic publishing necessitate careful consideration. Concerns surrounding authenticity, transparency, reproducibility, bias, data privacy, dependence on AI, and peer review are addressed. The article delves into the evolving policies of major publishers, including Elsevier, Wiley, and Springer, regarding the use of generative AI in scholarly publications. While publishers exhibit a growing interest in AI, variations in policies reflect ongoing debates on transparency, accountability, and the ethical implications of AI-generated content. The discussion extends to the educational impact of AI on students and researchers, emphasizing the need for critical evaluation and support for emerging scientific writers. The conclusion acknowledges the transformative potential of AI in scientific inquiry but underscores the importance of understanding and respecting its limitations. Balancing the benefits of AI with ethical considerations is crucial for maintaining the integrity of research practices in an era increasingly shaped by technological advancements.

**Key words:** Artificial Intelligence, Research, Publication, Privacy, Plagiarism, Medical Education

### INTRODUCTION

Artificial Intelligence (AI) has swiftly infiltrated various domains of society, including the realm of research. At its essence, AI pertains to the emulation of human intelligence within machines that have been meticulously programmed to exhibit cognitive abilities and acquire knowledge akin to that of humans [1-2]. These encompass cognitive functions such as cognitive analysis, linguistic comprehension, strategic formulation, and even creative expression. The utilization of AI in the field of research has brought forth a multitude of potentialities, encompassing intricate data analysis, prognostic modeling, and beyond. With these remarkable capabilities, AI has the potential to significantly augment the efficiency, precision, and scope of research endeavors. AI has ushered in a new age of data analysis, literature assessment, and the overall progression of knowledge [3-4]. However, as with any powerful tool, the promise it holds is both fascinating and fraught with ethical concerns.

The utilization of AI in the realm of scientific investigation encompasses a vast and remarkable range. Through the streamlining of data collection processes and the acceleration of analytical procedures, AI has consistently demonstrated its capacity to fundamentally transform the methodologies employed in scientific investigations. Moreover, by leveraging historical data, AI algorithms have exhibited the capability to forecast forthcoming patterns and trends, thereby offering unprecedented insights into the future of research practices [5]. In the realm of biomedicine, the utilization of AI-driven algorithms enables the comprehensive analysis of extensive datasets, facilitating the identification of intricate patterns and correlations that surpass the cognitive capacity of humans [6]. Consequently, this expedites the process of drug discovery and facilitates the development of personalized medicine [7]. In a parallel manner, within the realm of social sciences, AI tools undertake the task of processing and scrutinizing vast quantities of data in order to extract valuable insights pertaining to human behavior, economic trends, and shifts within society.

The impact of AI on academic discourse has inevitably extended to the generation of publications, which serve as vital conduits for disseminating scholarly knowledge [8-9]. The exponential proliferation of scholarly publications in the contemporary era of digitalization surpasses the cognitive capacity of any individual to peruse, let alone scrutinize. In recent times, the utilization of AI tools, such as content summarizers and literature review assistants, has become prevalent [10]. These tools have effectively intervened in the review process, facilitating a more efficient and organized approach. By

leveraging AI, the risk of crucial information being overlooked amidst the overwhelming volume of data is mitigated. Furthermore, the implementation of AI-powered plagiarism detection systems has significantly enhanced the preservation of academic integrity by effectively identifying instances of replicated content with unprecedented efficiency.

With the growing integration of Artificial Intelligence (AI) in various domains, including academic publishing, major publishers are emphasizing clear AI usage policies. The AI progression into publishing should be limited to language check and proofreading which enables the author and the reader to be on the same rhythm. This allows the flow of knowledge to be streamlined and claims justified in a way that is agreeable among the research fraternity.

Nevertheless, the advantages of AI in the realm of scientific investigation and scholarly literature are a complex phenomenon with both positive and negative implications [11]. With the progressive integration of AI systems into domains previously exclusive to human cognition, there emerges an augmented potential for the manifestation of biases, inaccuracies, and unethical practices.

## **ETHICAL ASPECTS OF AI IN PUBLICATIONS**

As AI plays a more pivotal role in research, it is imperative to address the ethical implications surrounding its use in publications. A few of these concerns include:

### **Authenticity and Originality**

AI, particularly content generation tools, possess the capacity to generate extensive quantities of content, encompassing both straightforward textual passages and intricate graphs as well as data visualizations. The prodigious proliferation of AI engenders an ethical quandary: where does one demarcate the boundary between human-originated authentic content and AI-generated content? The foundation of research lies in its originality. It is anticipated that every researcher will provide innovative insights or discoveries within their respective domains. The advent of AI-generated content, nevertheless, complicates this demarcation.

In the context of automated generation of textual content or data visualization through machine algorithms, it becomes pertinent to delineate the boundaries of authorship. Is it ethically justifiable for a researcher to assert authorship for insights or content predominantly generated by an algorithm? This matter encompasses not only the allocation of academic recognition but also the preservation of intellectual property entitlements. If substantial segments of a manuscript or scholarly article are derived from automated processes, it has the potential to undermine the credibility and expertise typically associated with meticulous academic inquiry. There is also a potential risk of researchers developing an excessive dependence on AI, opting to delegate the majority of tasks to algorithms while humans assume a secondary role.

### **Transparency**

Transparency has historically been a cornerstone of research. The implementation of transparent methodologies and processes is crucial in ensuring the credibility of a study's findings. With the integration of AI in research, the aspect of transparency assumes an additional level of significance. AI models, particularly those of a complex nature, function in manners that even professionals occasionally find challenging to decipher. In instances where these models exert influence on research, particularly during the phase of data analysis, it becomes imperative to disclose their participation.

Additionally, there is the matter of the data upon which these models were trained. If an AI model, for instance, underwent training on a dataset containing inherent biases, its resulting conclusions may exhibit a distorted perspective. In the absence of transparent disclosure, these inherent biases may elude detection, thereby resulting in potentially misleading or inaccurate research findings.

### **Reproducibility**

Reproducibility stands as a fundamental principle within the realm of scientific research. In order for findings to be deemed acceptable, it is imperative that they demonstrate replicability by impartial entities. The opaque nature of numerous AI models poses a significant challenge to this fundamental principle. In the scenario where researchers employ an AI tool to deduce conclusions, yet the tool's functionality remains inscrutable, how may fellow researchers authenticate said conclusions?

This matter extends beyond the realm of academia and carries practical ramifications. In disciplines such as medicine, reproducibility plays a critical role in ensuring the safety and efficacy of treatments and interventions. The proposition of a novel treatment modality by an AI model, while lacking transparency regarding its underlying mechanisms, elicits ethical concerns pertaining to the veracity and safety of said treatment.

### **Bias and Fairness**

Each dataset inherently bears the mark of its creators, whether it is a deliberate act or not. If an AI model undergoes training with biased data, its subsequent outputs will inherently exhibit and propagate those biases. In the realm of scientific inquiry, this can have notably deleterious consequences. Please contemplate a theoretical AI model that has undergone training using primarily historical health data derived from male individuals. If this model is subsequently employed for the purpose of investigating a medical condition that impacts individuals of both genders, its findings may possess an inherent bias, potentially disregarding intricacies associated with the physiological characteristics specific to females.

Biases observed in AI outputs are not merely hypothetical hazards, but tangible obstacles that necessitate the earnest attention and contemplation of the research community. Rigorous data curation and constant validation of AI models against diverse and representative datasets are imperative in ensuring optimal outcomes.

### **Data Privacy**

Given the advanced computational abilities of AI to efficiently process and evaluate extensive datasets, it is imperative to acknowledge the ethical obligation of safeguarding data, particularly personal or sensitive information. This entails not only implementing measures to safeguard data from unauthorized access but also guaranteeing that AI models uphold the privacy rights of individuals. In numerous jurisdictions, stringent regulations pertaining to data privacy are in place, necessitating that researchers employing AI diligently adhere to compliance measures in order to prevent any potential harm or misuse of data. Failure to do so can result in severe consequences.

Moreover, respecting data privacy not only fosters trust among users but also ensures that AI technologies are used in a responsible and ethical manner. Therefore, researchers must incorporate privacy protection protocols from the very beginning of their AI projects, as this will establish a solid foundation for conducting research that respects data privacy and upholds ethical standards.

Furthermore, the ethical aspect transcends mere adherence to legal regulations. While it is true that the capability of an AI model to extract and analyze specific data exists, it is crucial to exercise caution and consider the potential privacy risks associated with such actions.

### **Dependence on AI**

There exists a potential risk of developing an excessive reliance on AI, notwithstanding its provision of remarkable tools to augment the process of scientific inquiry. Researchers may potentially face the peril of diminishing the significance accorded to critical thinking and vigilant oversight if they excessively depend on AI. The phenomenon in question bears resemblance to the potential impairment of mental arithmetic skills resulting from excessive reliance on a calculator, despite the inherent utility of said device.

Engaging in scientific inquiry necessitates the cultivation of a heightened cognitive capacity for discerning analysis, healthy skepticism, and innovative resolution of complex quandaries. While AI exhibits proficiency in handling vast amounts of data and generating content, it falls short in terms of possessing the innate cognitive abilities of intuitive thinking and divergent reasoning that are inherent to human beings. In order to maintain the integrity of the research process, it is imperative to achieve a harmonious equilibrium between the capacities of AI and human comprehension.

### **Peer Review**

Peer review is an indispensable component of academic research as it ensures that published works adhere to rigorous standards. This approach assumes that the individuals involved in the authorship and review process are of the humanized model, accepted by the population of generalized perceptive as a harmony. The incorporation of AI-generated content introduces a heightened level of complexity to this dynamic. In what manner may a human evaluator proficiently assess content that has been either partially or wholly generated by an automated computational algorithm? Which criteria are deemed appropriate for utilisation? In the event that AI models were integrated into the peer review process, ensuring their adherence to comparable levels of objectivity and rigour would be of paramount concern. One counterargument is that human evaluators can adapt and develop new criteria for assessing AI-generated content, ensuring that it meets the required levels of objectivity and rigour in the peer review process. Another counterargument is that AI models can be trained to mimic human evaluation standards, making it possible to assess their adherence to comparable levels of objectivity and rigour.

Due to the increasing sophistication of AI tools, they have gained the capability to not only produce information but also formulate comprehensive research concepts or methodologies. This concern is expected to gain further significance as these medical instruments continue to progress. The process of peer review, which relies on human judgment as its fundamental basis, must evolve to effectively address the challenges and prospects presented by AI tools. This evolution may involve incorporating AI algorithms into the peer review process to ensure that the evaluation of research concepts and methodologies remains on par with the advancements in AI technology. Additionally, there is a need for establishing guidelines and standards to assess the credibility and reliability of AI-generated research. Collaboration between AI experts and medical professionals will be crucial in shaping the future of peer review and ensuring that it maintains its integrity in the face of rapidly evolving AI technology.

### **AI POLICY AMONG DIFFERENT PUBLISHERS**

Based on the analysis of the policies of different publishers such as Elsevier, Wiley, Hindawi, Oxford, JMIR, BMJ, and Harvard, it is evident that there is a growing interest and concern regarding the use of generative AI-based writing in scholarly publications. The policies of these publishers vary, with some prohibiting the use of AI-generated text, while others allow its use under certain conditions.

Elsevier, for instance, has declared its commitment to monitoring the development around generative AI and refining its policy if necessary [11]. This indicates a cautious approach, acknowledging the potential impact of AI-based writing on scholarly publications and the need for ongoing evaluation of its implications. The use of generative AI in scholarly writing has raised concerns about transparency, explainability, and the ethical implications of AI-generated content [12]. Emphasize the need for public policies regulating the use of AI in healthcare that balance societal interests in high performance and transparency/explain ability. This highlights the broader ethical and societal considerations surrounding the use of AI in academic and scientific writing.

Furthermore, the impact of AI-based writing tools on students and researchers has been a subject of study. While AI-powered writing tools can be used for text translation, spelling improvement, and text summarization, the study by suggests that students' use of AI did not necessarily result in greater opportunities for strategic feedback and associated learning

outcomes [13]. This underscores the importance of critically evaluating the educational implications of integrating AI-based writing tools in academic settings.

In the context of scientific writing, the development of policies regarding the use of generative AI-based writing should also consider the complexities of scientific communication and the need to support emerging scientific writers' development as versatile communicators work emphasizes the intricate rhetorical environments scientists navigate and the necessity to provide support for the development of scientific writing skills in medical education [14-16].

### 1. Elsevier

Elsevier's AI policy for medical publications emphasizes transparency, accountability, and human oversight. AI can be used to improve readability but not to replace key authoring tasks such as drawing scientific conclusions or providing clinical recommendations. Authors must disclose the use of AI and are responsible for the content. AI cannot be listed as an author. Elsevier prohibits the use of AI to create or alter images in manuscripts, except if it's part of the research design or methods, which must be described in a reproducible manner in the methods section.

### 2. Wiley

Wiley's AI policy for medical publications, as outlined in the Journal of Product Innovation Management (JPIM), states that generative AI tools like ChatGPT cannot be listed as authors. Their use in manuscript preparation requires full disclosure and reporting. The author is responsible for the accuracy of the information provided by the AI tool. Any use of AI must be described in detail in the Methods or Acknowledgements section. If AI technologies are used, a disclosure statement must be included in the cover letter and a dedicated appendix.

### 3. Springer

Springer publishing group has outlined a brief editorial policy regarding use of AI in publishing with continuous monitoring of the recent advancement in AI technologies. They have rejected any authorship for LLMs (Large Language Models) based on the principle that authors are accountable for their work while AI tools such as ChatGPT cannot be held accountable for the work they produce. Any

## CONCLUSION

Undoubtedly, AI stands as a formidable instrument that has revolutionized the realm of scientific inquiry. The ability of this technology to effectively analyze extensive datasets, generate informative content, and accurately predict outcomes has the potential to significantly enhance the caliber and scope of scientific inquiries. Nevertheless, it is imperative to comprehend and uphold the limitations of AI's function within the realm of scientific investigation.

The pursuit of knowledge, at its core, is an inherently human undertaking. The individual's motivation stems from an innate sense of inquisitiveness, a profound yearning to comprehend the intricacies of the world, and an unwavering determination to rectify challenges that impact the entirety of humankind. AI has the potential to facilitate this procedure by offering advanced tools and valuable insights that may surpass the capabilities of human individuals. However, it is imperative that these fundamental human components, namely creativity, critical thinking, and ethical judgment, remain irreplaceable.

The forthcoming trajectory of research involving AI revolves around collaboration rather than substitution. Researchers have the opportunity to harness the capabilities of AI while incorporating their distinct expertise, thereby guaranteeing that the outcomes are characterized by novelty and ethical integrity. Similar to any instrument, the effectiveness and suitability of AI are contingent upon its utilization. It is incumbent upon the research community to employ AI in a responsible, transparent, and ethical manner, thereby safeguarding the integrity of the quest for knowledge in accordance with its fundamental principles. In conclusion, while AI offers transformative potential for research, its integration comes with a host of ethical considerations. Addressing these will be vital to maintain the integrity, validity, and ethical standards of research in the age of AI.

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