



# When using Artificial Intelligence Tools in Scientific Publications Authors should include the Prompts and the Generated Text as Part of the Submission

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## Abstract

Most, if not all, journals require the use of Large Language Models (LLMs), such as ChatGPT, to be acknowledged. This article argues that current guidelines do not go far enough as the use of an LLM may be acknowledged but the reviewers, and future readers, do not know which parts of the article were generated with AI (Artificial Intelligence) assistance and how that text was subsequently edited. It's possible that an entire article could be generated with AI and, as long, as the authors acknowledge that an LLM was used then they are meeting the journal's guidelines. In this opinion article current publisher guidelines are examined, followed by a brief case study which highlights some of the issues that the scholarly community faces. Proposed changes to the guidelines are presented which say that LLM prompts, and the generated text, should be provided to the reviewers, and to future readers, so that they can see which parts of the article were generated and what edits were made to that text.

**Keywords** Ethics · Peer review · Large language models · Authorship

## Introduction

Large Language Model[s] (LLM[s]), such as ChatGPT, can assist researchers in a variety of ways, including planning the structure of papers, producing drafts and correcting grammar. However, the author(s) must remain vigilant as LLMs have been known (what is often called) to hallucinate, for example, in fabricating references, or citing the literature incorrectly (Walters & Wilder, 2023). There are also many ethical considerations that are still to be addressed in using LLMs in scholarly publishing (Lund et al., 2023). It is hoped that this paper goes some way to addressing some, but certainly not all, of those. It is important that any LLM assistance be acknowledged (Kendall & Teixeira da Silva, 2024).

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When LLM tools became publicly available, there was a discussion whether an AI chatbot could be listed as an author (Stokel-Walker, 2023).<sup>1</sup> It is now generally accepted that these tools cannot be an author on a scientific, peer reviewed paper as LLMs do not meet the criteria for authorship (Anon, 2023; Yeo-Teh & Tang, 2023). Lund and Naheem (2024) reported that 98.9% of the 300 journals examined, explicitly mention that AI tools cannot be listed as an author. Only two journals allowed this, but they have since revised their policy.

Tang (2023a) has suggested that journals should specify where ChatGPT can be used in academic papers, in addition to declaring that it was used. Tang argues that ChatGPT should not be used in the conclusion or the results sections as these are the primary sections where innovative knowledge is presented and ChatGPT is unable to contribute to the originality of the paper.

The same author (Tang, 2023b) argues that journal editorial boards should develop policies as to how much of a paper can be generated by AI tools. Authors would need to follow these rules, and any violation would be considered plagiarism.

Hosseini et al. (2023) provides ways that AI (or Natural Language Processing (NLP) as it is referred to) can be used and presents a draft policy as to how the use of NLP-systems should be declared when submitting articles to Accountability in Research. For example, any text written by an AI tool should be checked for accuracy, bias, relevance & reasoning, and researchers should disclose which parts of the text have been written with the assistance of an AI tool. The authors must also take full responsibility for all text that is AI generated.

In a recent paper, Kocak (2024) looks at the publication ethics of AI.

COPE (Committee on Publication Ethics), in their position statement on authorship and AI tools state “*Authors who use AI tools in the writing of a manuscript, production of images or graphical elements of the paper, or in the collection and analysis of data, must be transparent in disclosing in the Materials and Methods (or similar section) of the paper how the AI tool was used and which tool was used. Authors are fully responsible for the content of their manuscript, even those parts produced by an AI tool, and are thus liable for any breach of publication ethics.*”<sup>[1]</sup> This is a stronger statement than many journals make.

This opinion article argues that current guidelines (such as those mentioned above and also presented below (Publisher’s guidelines)) do not go far enough. The primary issue is that an author can acknowledge the use of an LLM but does not have to say how much of the paper, or which parts, were written with LLM assistance. This means that a paper could be 100% written by an LLM and the acknowledgment could be exactly the same as for a paper that utilised an LLM to help with a short paragraph. The proposed guidelines presented here are much more robust. They are aimed at enabling reviewers to be more informed as to which parts of a paper have had LLM assistance and how much editing was done to the text generated by the AI tool.

Following a brief look at publisher’s guidelines, a case study is presented, which highlights some of the issues that the current guidelines fail to address. This is followed by the proposed guidelines.

<sup>1</sup> <https://publicationethics.org/cope-position-statements/ai-author>, accessed 05 March 2024 (archive: <http://web.archive.org/web/20240113152051/https://publicationethics.org/cope-position-statements/ai-author>)

## Publishers Guidelines?

In this section, six publishers are studied to see what their guidelines say about the use of generative AI. The publishers were arbitrarily chosen, but they do represent large, well known publishers. The aim is not to provide an indepth analysis, but perhaps this would be worthy of a future research project.

### BMJ

BMJ<sup>2</sup> offer one of the most complete guidelines with regard to this article. As well as asking for an acknowledgement, the type of AI used, and why it was used, it also requests “*Consider including a summary of the input, output, and the way in which the AI output was reviewed on the part of the authors as supplementary files or additional information for the editor to review.*” This is very much in line with the proposals in this article, but the authors are only asked to consider providing this information, which means that are not required to do it.

### Elsevier

The publisher’s guidelines<sup>3</sup> says “*Where authors use generative AI and AI-assisted technologies in the writing process, these technologies should only be used to improve readability and language of the work. Applying the technology should be done with human oversight and control and authors should carefully review and edit the result, because AI can generate authoritative-sounding output that can be incorrect, incomplete or biased. The authors are ultimately responsible and accountable for the contents of the work.*”

Writing as the Editor-in-Chief of Arthroscopy: The Journal of Arthroscopic & Related Surgery, an Elsevier journal, Lubowitz (2024) says that “*Authors who use AI in the scientific writing process must disclose the use of AI LLM in their manuscript including a description of the tool and reason for use*”.

The publisher’s guidelines do not state that the use of generative AI has to be acknowledged. The journal’s statement allows generative AI to be utilised in the writing process, together with the reason why and the tool that was used. These two guidelines appear to be contradictory. Perhaps Elsevier allows journals to use their own discretion but it would be useful for publishers and its journals to be more aligned?

If an LLM has been used to write part of the paper, as allowed by the journal, the acknowledgement does not have to say how much of the paper was written by generative AI, or which parts of the paper were written with LLM assistance.

### Sage

Sage<sup>4</sup> arguably provide the most strict requirements. Sage differentiates between Assistive AI (disclosure is not required) and Generative AI (disclosure is required). A template is

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<sup>2</sup> <https://www.bmj.com/content/ai-use>, accessed 10 November 2024 (archive: <http://web.archive.org/web/20241110093543/https://www.bmj.com/content/ai-use>)

<sup>3</sup> <https://www.elsevier.com/about/policies-and-standards/generative-ai-policies-for-journals>, accessed 10 November 2024 (archive: <http://web.archive.org/web/20241110094046/https://www.elsevier.com/about/policies-and-standards/generative-ai-policies-for-journals>)

<sup>4</sup> <https://group.sagepub.com/assistive-and-generative-ai-guidelines-for-authors>, accessed 10 November 2024 (archive: <http://web.archive.org/web/20241110094337/https://group.sagepub.com/assistive-and-generative-ai-guidelines-for-authors>)

provided, which must be completed for generated AI. This includes specifying the rationale for using AI, along with the prompt that was used and the response that was generated. This is very much in line with the thoughts presented in this paper.

## Springer

The publisher's guidelines says<sup>5</sup> *“Use of an LLM should be properly documented in the Methods section (and if a Methods section is not available, in a suitable alternative part) of the manuscript. The use of an LLM (or other AI-tool) for “AI assisted copy editing” purposes does not need to be declared.”*

The type of content that falls within assisted copy editing is given, but there is no definition of what “properly documented” means. Springer, along with some other publishers, does not require adoption of utilising AI for copy editing. This is something I disagree with (Kendall et al., 2016). Looking at a number of Springer journals, they are aligned with the publisher's guidelines, if not identical.

## Taylor & Francis

The publisher's guidelines says<sup>6</sup> *“Authors must clearly acknowledge within the article or book any use of Generative AI tools through a statement which includes: the full name of the tool used (with version number), how it was used, and the reason for use. For article submissions, this statement must be included in the Methods or Acknowledgments section.”*

Looking at a number of Taylor & Francis journals, they do not appear to have a specific statement about the use of AI tools, presumably falling back on the publisher's guidelines. This is to be applauded but it might be beneficial to provide a link to the publisher's guidelines.

## Wiley

The Wiley guidelines<sup>7</sup> require a statement of the following form *“In preparing this manuscript, the author(s) used the following [GENERATIVE AI TECHNOLOGIES/TOOLS] in order to [REASON/S]. The specific content generated by these AI technologies/tools in the manuscript is clearly marked and described in a dedicated appendix, to be used for editorial and review purposes. Prior to submission, the author(s) reviewed the content generated and take(s) full responsibility for the content of the submitted manuscript.”*

This is to be welcomed and closely aligns with the proposals presented here.

<sup>5</sup> <https://www.springer.com/us/editorial-policies/artificial-intelligence--ai-/25428500>, accessed 10 November 2024 (archive: <http://web.archive.org/web/20241110094636/https://www.springer.com/us/editorial-policies/artificial-intelligence--ai-/25428500>)

<sup>6</sup> <https://taylorandfrancis.com/our-policies/ai-policy/>, accessed 10 November (archive: <http://web.archive.org/web/20241110094840/https://taylorandfrancis.com/our-policies/ai-policy/>)

<sup>7</sup> [https://onlinelibrary.wiley.com/pb-assets/assets/15405885/Generative%20AI%20Policy\\_September%202023-1695231878293.pdf](https://onlinelibrary.wiley.com/pb-assets/assets/15405885/Generative%20AI%20Policy_September%202023-1695231878293.pdf), accessed 10 November 2024 (archive: [http://web.archive.org/web/20241110095106/https://onlinelibrary.wiley.com/pb-assets/assets/15405885/Generative%20AI%20Policy\\_September%202023-1695231878293.pdf](http://web.archive.org/web/20241110095106/https://onlinelibrary.wiley.com/pb-assets/assets/15405885/Generative%20AI%20Policy_September%202023-1695231878293.pdf))

Of the journals that were checked they do not have dedicated guidelines about the use of AI tools which is positive, but it would be useful to provide a statement that Wiley's guidelines are to be used, and to provide a link.

## Comments

Although only six publishers are considered above, most publishers have similar statements (e.g. JAMA (Flanagin et al., 2023)) but they vary in their level of detail and what is required. In my view there are also shortcomings which provide authors the opportunity to abide by the publisher's guidelines, but still act in ways that could be seen as unethical or, least, not acting within the spirit of those guidelines.

There is also an issue around reviewing papers that acknowledge the use of LLMs. It assumes that the reviewer either knows the guidelines, is willing to look them up, or is inclined to comment on its use when the guidelines are a little opaque. The most likely scenario is that the reviewer just reviews the paper that is presented, in the same way that they have been doing for years.

It is good to see these guidelines, but they need to go further and also ensure that the publisher and the individual journals are aligned. Perhaps guidelines should be at the level of the publishers and the journals link back to those which would stop duplication of text and, more importantly, mixed messaging.

## Case Study

In 2023 Biswas published thirteen single authored articles (Biswas, 2023a, b, c, d, e, f, g, h, i, j, k, l) that had ChaptGPT in the title. Teixeira da Silva, 2023 has previously commented on these papers in a letter to the Annals of Biomedical Engineering. A typical statement in the papers says "*The author acknowledges that this article was partially generated by ChatGPT (powered by OpenAI's language model, GPT-3; <http://openai.com>). The editing was performed by the author.*" Biswas (2023e) says "None" in the acknowledgement section but does acknowledge the use of ChatGPT in the article's abstract.

Biswas has also uploaded several preprints:

1. "*Prospective Role of Chat GPT in the Military: According to ChatGPT*"
2. "*Role of Chat GPT in Education*" (URL:<https://ssrn.com/abstract=4369981>)
3. "*Importance of chat GPT in Agriculture: According to chat GPT*"
4. "*Role of ChatGPT in Gaming: According to ChatGPT*"
5. "*Role of ChatGPT in the Film Industry: According to ChatGPT*"

Biswas does acknowledge the use of LLMs, saying that the article was partially generated by ChatGPT, but we do not know how much of the article, or which sections, were generated. Furthermore, it is stated that the editing was performed by the author, but we do not know how much editing was carried out.

Som Biswas used ChatGPT to write these peer reviewed articles, saying “*I’m a researcher and I publish articles on a regular basis. If ChatGPT can be used to write stories and jokes, why not use it for research or publication for serious articles?*”<sup>8</sup>

It is noticeable that the twelve 2023 papers, and the five preprints, do not cite any of his own papers, either from his previous work, or from this set of papers. You would normally expect to see self-citations to demonstrate knowledge about the topic or even, more cynically, to increase your own h-index.

It is also noticeable that the articles cover a wide range of topics, which is unusual for a set of single authored papers. For example, the three articles published in the *Annals of Biomedical Engineering* covered global warming (Biswas, 2023j), public health (Biswas, 2023k) and the USMLE exam (Biswas, 2023b). Another four articles, published in the *Open Access Journal of Data Science Artificial Intelligence*, discussed Pharmacy (Biswas, 2023c), Law (Biswas, 2023f), Social Media (Biswas, 2023g) and Insurance (Biswas, 2023h).

It would be useful to have access to the prompts that generated the text for these articles and the text that was generated. This would enable the reviewers to be more informed about the paper they are reviewing.

## Comment

Reflecting on the guidelines that are currently provided, for example by COPE and the publishers, and looking at the case study presented here, it demonstrates that current guidelines are inconsistent with one another and do not go far enough. This enables author(s) to adhere to the guidelines, but this does not provide the reviewers with enough information to gauge how much, and which parts, of the article were written with AI assistance. Moreover, author(s) can cherry pick which guidelines to adopt. This is not only an issue for the reviewers, but it can also make it difficult for the author(s) if the paper is rejected, as they need to update the paper to adhere to the guidelines for the new journal/publisher. For example, if an author(s) submits to a Wiley journal and the paper is rejected, they may then target a Sage journal which is more stringent. Will the author(s) i) know this and ii) have the information that is required for the new submission?

It would be better if there was a single guideline, which every journal, publisher and trade body adopted. I would suggest that the guidelines proposed here should form the basis of these guidelines.

## Acknowledging the use of Large Language Models

The acknowledgement given by Biswas meets the requirements of many of the journals. However, the wording of the acknowledgement enables a researcher to generate an entire article, do a very light edit (if any at all) and submit the article. These

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<sup>8</sup> <https://www.thedailybeast.com/how-this-doctor-wrote-dozens-of-science-papers-with-chatgpt>, accessed 05 March 2024 (archive: <https://web.archive.org/web/20231230155510/https://www.thedailybeast.com/how-this-doctor-wrote-dozens-of-science-papers-with-chatgpt>)

minimal changes may not warrant being an author and, as an AI tool cannot be listed as an author, this is problematical, especially for single authored papers.

It is impossible to say how much of the articles published by Biswas were generated by ChatGPT. Moreover, there is no way of telling how much editing was done. This, of course, is generally true of any articles that have been written with LLM assistance, which are acknowledged using current guidelines. As reviewers, and subsequent readers, we do not know if 1%, or 100% (or somewhere in between), of the paper has been generated and what edits have been applied.

## Proposal

Given current guidelines and the way peer review is performed, it is impossible for a reviewer, and subsequent readers, to know i) how much of an article was written by human(s)/AI, ii) which parts of the article were written with AI assistance and iii) how AI was used (e.g. what prompts were used and what text was generated). Publishers and journals are therefore encouraged to adopt much stronger guidelines. The following guidelines are proposed.

1. When an AI tool is used, it must be acknowledged, giving details of the tool that was used, the version and the date(s) the tool was utilized. This should be stated as an acknowledgment in the main paper.  
[This is the level of acknowledgement that is generally required at present].
2. Author(s) should specify which sections of the paper were produced with the assistance of an LLM and, by definition, which parts were not.
3. The AI prompt(s) should be provided, along with the text that was generated.
4. If the authors are using an LLM to improve the language, this should also be acknowledged. This has also been argued for, but from the perspective of using a publication consultant in Kendall et al., 2016. Like 3 above, the AI prompts and the resultant text should be provided. In addition, the original text that the LLM was asked to improve should also be provided.
5. A supplementary file should be provided as part of the submission, giving the details of 2–4, above.
6. The supplementary file should be made available to the reviewers. This will enable them to view the AI generated text and compare it with the edits made by the human author(s). The reviewer can gauge whether the AI generated text, and subsequent edits, is sufficient for the human(s) to be an author. The supplementary file should also be available for readers of the article, once it has been published.

COPE should also strengthen its guidelines, to incorporate the above suggestions, as their current statement (“*must be transparent in disclosing ... how the AI tool was used*”) is not strong enough.

Adopting these guidelines will enable reviewers to have full information when reviewing a paper, so that they are fully aware of which parts of the paper were written with AI assistance and they can also see the edits that were made to the generated text.

## Is there a Limit after which Authorship cannot be Claimed?

One of the comments received on an earlier version of this article was “*Should there be a cut off limit, above which an author cannot claim authorship?*”.

This is akin to somebody applying for promotion and asking “*How many papers do I have to publish?*” There is no definitive answer as there are more factors that have to be considered other than a specific number of published papers.

In the case of using an LLM it is not possible to say “*The authors can claim authorship if they wrote 50% of the article without AI assistance.*” Tang, 2023a draws out a related argument, arguing that ChatGPT should not be used in the conclusion or results sections as these are the primary sections where innovative knowledge is presented. Therefore, in these sections, there would be zero tolerance. A further example is writing the text and then asking an LLM to improve it. How do you measure that in percentage terms?

Therefore, where articles have acknowledged the use of LLMs, it is up to the reviewers/editors to judge whether the author(s) have made a significant enough contribution, based on the article itself and the supplementary information provided about how an LLM was utilised.

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**Declarations**

No AI tools were used in the preparation of this article.

**Ethics Approval** N/A

**Conflicts of Interest** The author manages an X account (fake\_journals) and a web site (<https://predatory-publishing.com>).

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