Editorial

Democratising knowledge: AI's role in academic writing

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1 Introduction

Chatbots such as ChatGPT and Gemini have democratised access to artificial intelligence for everyday tasks such as drafting emails, suggesting weekend activities and even composing music. ChatGPT even wrote the title for this editorial! By design, these chatbots provide an almost instantaneous, human-like response to prompts and can be nudged into changing the tone and format of generated text to anything from a Shakespearean sonnet to the squeaks of Spongebob Squarepants or even 'jive' (think of the 1980 film *Airplane!*). Their ability to generate such text has been keenly welcomed by various businesses to make tasks such as customer service and marketing more cost- and time-efficient.

However, in the field of academia, the response to the use of chatbots and large language models (LLMs) has been notably lukewarm. In particular, there has been concern about the use of AI in academic writing – and perhaps for good reason. LLMs are known to 'hallucinate' and generate responses that are untrue, conflict with previously generated text or deviate from the input prompt or instructions (Zhang et al., 2023). Of the three types of hallucination, the first may be the most problematic. One notable example is that of two US lawyers who were discovered to have used ChatGPT for research when they submitted entirely imaginary citations in a court filing (Milmo, 2023). It is conceivable that a similar situation could occur in academic writing as the academic journal industry often rewards the quantity of research output, instead of its quality with metrics such as the h-index and impact factor. For authors in many scientific fields, there is a strong correlation between the number of published papers and the number of citations, which is one measure of impact and can bolster an academic's CV when applying for grants and funding (Grech, 2022; Sandström & Van den Besselaar, 2016). In an effort to expedite the writing of an article and avoid becoming a victim of the 'publish or perish' aphorism, authors may turn to chatbots to rephrase or rewrite text but fail to ensure that the responses generated are factual and accurate. Although journal articles are peer-reviewed, mistakes can often slip through the net, as evidenced by a *Nature* investigation that found that over 10,000 papers had been retracted in 2023, with the rate of retractions rising because of citation fraud and plagiarism (Van Noorden, 2023). The increasing use of AI has also made it more difficult to identify fake or fraudulent papers as some companies, known as 'paper mills', are now producing fake papers to order, with text and images that are difficult to conclusively prove to be AI-generated (Liverpool, 2023).

2 Ethical Considerations

Plagiarism may be another ethical issue to consider in academic writing as chatbots can be coaxed into outputting whole sections of text from their training data (Nasr et al., 2023). There is a risk that models will output sections of text from other authors without citations, leading users to unknowingly plagiarise other authors. There has been some debate about whether the model or, in the case of closed-source models, the company that owns it, should be listed as an author on the paper (Stokel-Walker, 2023). Some scientific articles have already begun to cite ChatGPT as an author. Though this is a deep philosophical debate, in practice the UK government does not recognise non-humans as authors or inventors and, therefore,

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chatbots cannot be credited (Tobin, 2023). However, it is difficult to know how much of its training data it draws on when generating responses and this raises questions about whether, and even how, those authors should be credited.

The question of how training data relates to outputs raises another ethical issue around the use of LLMs for academic writing. LLMs are often trained using text data that is sourced, in part, from the Internet. Therefore, the model can adopt biases such as gender and racial biases that are present in many corners of the Internet (Ray, 2023). Chatbots such as ChatGPT are often fine-tuned and updated using feedback from human users, which can introduce further bias. The format of the training data itself has limitations. The model will have cultural and linguistic biases as it will only have access to knowledge that is written or published on the Internet, which may result in minority cultures and languages being excluded if they are not written or do not occur in text with the same frequency as other cultures. In the same way, the model may overestimate or underestimate the importance of historical events based on how many written accounts exist. The LLM may, therefore, output text that is representative of the training dataset but wholly unrepresentative of the wider world.

3   Potential Benefits

Perhaps these views are overly cautious. A *Nature* survey of 1,600 researchers revealed that 48% of respondents studied or developed using AI and a further 30% used it for their research (Van Noorden & Perkel, 2023). The most popular uses of LLMs included help with writing code, suggesting research ideas and conducting literature reviews (notably the most popular answer was 'for creative fun not related to my research'). These uses can all save researchers time and allow them to improve their workflow. From my own experience, I know that many of my fellow researchers are not native English speakers and using LLMs helps them improve their grammar and phrasing. They can even be used as a translator, which I have been told is more accurate than traditional translator tools like Google Translate. This benefit has also been noted in the literature as studies have shown that an AI-supported approach has a positive effect on the English writing skills of students who do not have English as a first language (Song & Song, 2023).

We should also question where the opposition to the use of AI tools originates. For example, when the printing press was invented by Gutenberg in 1450, it revolutionised the transfer of knowledge as common people now had wide access to books (Kertcher & Margalit, 2005). As such, those who ruled much of Europe with hege-

monic power, such as national monarchs and the Catholic Church, sought to ban the printing of any book without their explicit permission, not because the technology was not useful but to prevent their authority from being undermined and their ideas being challenged. Nowadays, very few authors choose to write their papers by hand, with the majority opting to use computers and word processors. The resulting work is printed in books for precisely the same reason the printing press was invented: to allow knowledge to be disseminated quickly and widely. Radio, telephones, television and the Internet can be considered progressions of these methods of sharing information. The stifling of the use of AI tools may concentrate power in those with the most access, preventing those in developing countries who are not native English speakers and who have less access to technology being left out of the field of academia. For example, many image generation tools such as DALL-E, Midjourney and Stable Diffusion currently charge users between $10 and $20 a month, putting the technology behind a paywall that may be inaccessible for many.
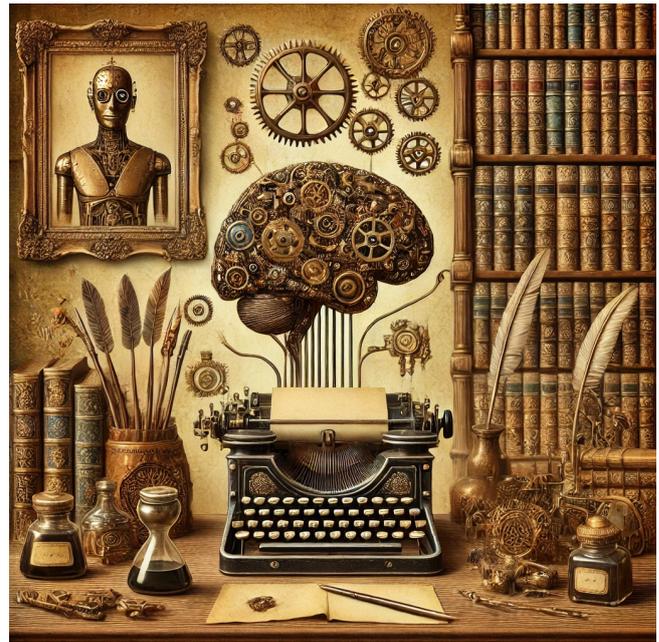

Figure 1: Image courtesy of the AI DALL-E

4   A Lesson from the Horseless Carriage

We may be able to look to historical examples to predict the future. For a moment, let us consider the roads of the early 1900s, when the main method of transportation was by horse and carriage, with London having 11,000 taxis that were all horse-drawn (Davies, 2004). The first

cars, produced from 1896, were unreliable and were widely ridiculed. They were referred to as 'horseless carriages' and the idea of them being able to compete with trains for long-distance travel was described as 'lunacy' (Winton, 2017). Despite early technological issues with cars, such as having insufficient power supplies, they steadily became more popular as they spread from the wealthy in the countryside to inner cities, where the intractable manure-related trouble with horses had mounted (ironically, the transition from horses to cars improved air quality at the time) (Geels, 2005).

As cars became more popular, deaths on the road increased, with 7,000 people being killed each year in road traffic accidents in the UK by 1931 (Driver and Vehicle Standards Agency, 2019). Safety measures were introduced by the government – although arguably much too late. Driving tests were only introduced in the UK in 1935, drink driving made an offence in 1967 and seat belts made compulsory in 1983, 87 years after cars were first manufactured (Gunn, 2018). By this time, there were almost 20 million 'horseless carriages' on the road – the progress of technology had far outpaced the safety regulations to manage it (Department for Transport, 2011). Similarly, the divided opinions about the use of LLMs, particularly in academic writing, may be misguided as AI will become as ubiquitous as cars. However, we can learn from the mistakes made from the motor industry and begin to implement regulations before AI is more widely adopted so that potential harms can be mitigated.

5 Recommendations for Authors in *Stolen Tools*

5.1 Be transparent

It should not be a shameful act to use a chatbot in the writing of an article. However, authors should make the extent of the use of AI transparent to both peer reviewers and readers. In the same way that authors are required to publish their code and references, authors using LLMs to generate text should publish a document that details which prompts were used to generate text and the exact response they received. This could be included at the end of the main text as an appendix or in conjunction with the references.

5.2 Use AI ethically

Even if the use of AI is clear and transparent, authors should aim to limit the amount of text that is sourced from chatbots. It would widely be considered misleading and disingenuous to present an article that contains 50% AI-generated text as the author's own work. If a similar amount of text were copied from a human author, it would be considered plagiarism. Software that checks the similarity of text such as Turnitin can be used to compare the similarity of an author's work to the AI-generated output. In my own studies, professors commonly stated that our work should not have a similarity score of more than 1% compared to other sources. Though the acceptable amount of AI-generated text is debatable and will be variable depending on the type of publication, a similarity score of 1% may be a reasonable general limit for AI-generated text.

5.3 Evaluate the outputs of AI models

LLMs and chatbots can produce results that are untrue or biased. One professor who caught his students using ChatGPT to write essays described the work as 'really well-written wrong' (Nolan, 2023). Authors should consider this information in the same way as asking an intelligent friend for answers: they may be smarter than you, but you should still fact-check them. Factual information should be cross-referenced with information from several reliable sources such as journal articles. Chatbots are known to make mistakes with providing citations on a topic and text that they produce so text should not be copied blindly.

5.4 Embrace the new technology!

Though we should be mindful of their pitfalls and push for the issues highlighted above to be addressed, I believe that LLMs could be very beneficial – if they are used ethically. The current generative AI models have their problems but they are relatively new and will improve over time. Using the tools ethically may provide numerous benefits such as improving workflow and the quality of written work for both native and non-native language speakers. As the horseless carriage showed, scepticism towards an emerging technology will not prevent it from being implemented and embraced. It may be worth trying the car; before long, you might look around and realise you're the only one still riding a horse.

6 Author's Note

I tried to ask ChatGPT about a claim that I'd read regarding AI not being considered a person by the UK Copyright Act. The response it gave me was confusing and seemed to be untrue: https://chat.openai.com/share/ed1cec4f-ac24-4bb6-902d-92bb742b9116

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