

Improving Clinical Study Publishing Success

Academic publishing is highly competitive, and this competition is only growing as more and more research papers are being submitted to top journals – submissions to Elsevier alone were up by around 270,000 in 2020.¹ To get published in a scientific journal, researchers must not only focus on their research quality but ensure their work is presented effectively, including images, references, and writing style, and is in keeping with journal-specific requirements. To ease some of this pressure on authors, artificial intelligence (AI) is being used to enhance academic writing and get manuscripts up to the high standards expected from journal editors and peer reviewers.

Clinical study research is critical for the future of science but it is equally important to publish your work in prestigious journals. This is important to communicate your findings to the academic community and the general public, which in turn helps advance global science. However, scientists don't generally go into research careers due to a love of manuscript writing.

According to Kazuhisa Takahashi in his paper *Pleasure of discovery: why we love research*, “It is simply because the process itself is delightful. This is especially true in medicine, as research can lead to the well-being of the people. At the same time, the experience of research also enriches the life of the physician.”²

Scientists are passionate about and are typically enthralled by their research, whether it's designing experiments, observing results or testing hypotheses. Collecting data and seeing the results of an experiment right in front of you is arguably one of the most exciting aspects of research.

Overall, most people tend to prefer performing the research rather than writing about why and how they did it. Despite the desire to showcase their results, many researchers actually find writing about their research findings a ‘necessary evil’ – a tedious task that often involves trying to avoid the dreaded writer's block and spending many hours in writing multiple drafts.

Barriers to Publishing

It doesn't help that getting published in an industry leading publication is no easy feat. In her paper *Rejection Blues: Why Do Research Papers Get Rejected?*, Suvarna Satish Khadilkar points to how many high-tier academic journals have rejection rates of around 80%.³ The paper also highlights the main reasons for rejection, such as weak research hypothesis, incomplete or inconsistent data, references that don't match the journal style, and poor language with spelling and grammatical mistakes.

This goes to show that despite being an expert researcher with extensive knowledge in a particular field, it does not guarantee your ability to deliver a well-produced manuscript. Technical and academic writing is an art that must be learnt and perfected. The problem is that most academic training does not focus on this critical aspect of being a researcher. Instead, courses often focus on developing specific research practices like quality data

collection, methodology, and analysis. While these are valuable skills that address many of the common reasons for rejection listed in Khadilkar's paper, academics can be left without the necessary writing skills required to produce a compelling manuscript.

This means that one of the main barriers to publishing a scientific manuscript for many researchers is the quality of the language in their papers. Developing writing skills and optimising the language before journal submission can reduce the likelihood that a researcher's paper will be desk rejected by the editorial team, which also increases its likelihood of progressing to peer review and eventual publication. It's possible that many of the errors resulting in rejection could have been identified in the early stages of writing if researchers had used a sophisticated AI English editing tool.

AI in Clinical Science

According to Deloitte's life sciences digital innovation survey, 76% of the respondents are currently investing in AI for clinical development.⁴ When discussing AI in clinical studies, it's often regarded in terms of improving research quality and accelerating clinical trials. In reality, researchers can use AI at every step of the research process, from conducting trials to collecting data and even manuscript writing, to overcome traditional barriers to publishing.

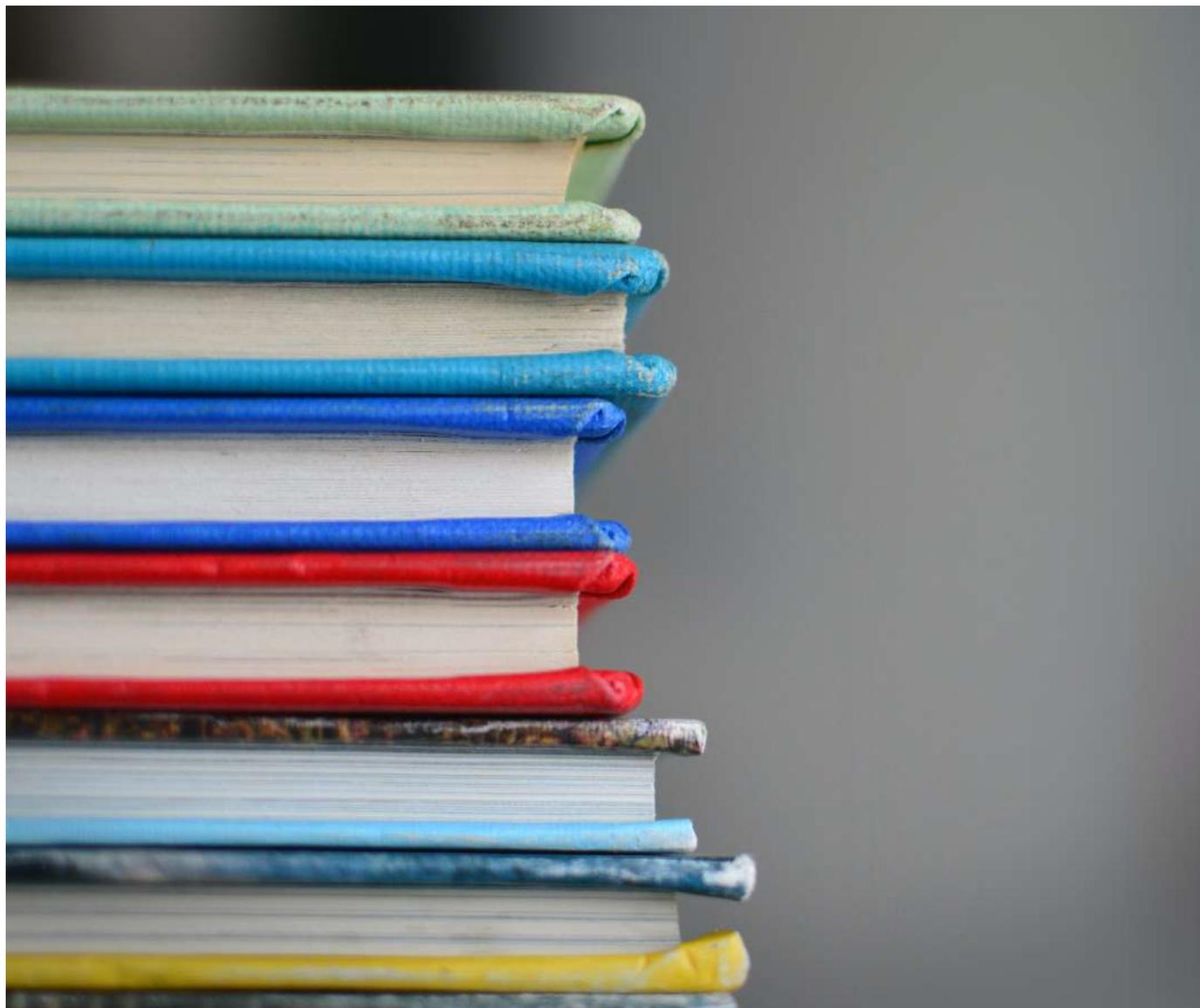
As a result of technological innovation, emerging AI tools can now help researchers develop several areas of the manuscript writing and journal submission processes. For example, Clarivate Analytics recognised the problems faced by academic journal editors and integrated AI into the editorial workflow. The AI software helps publishers connect with researchers to make sure content is peer-reviewed, published, marketed, and cited by the right audiences. The software allows publishers to access their journal's performance, manage workflows, and find reviewers.

Proofig is another AI software designed to help researchers by automatically scanning all images included in a research paper. The software checks each image against itself and other images in the paper, looking for any anomalies that might be caused by duplications. Researchers and publishers can use the final report to resolve any issues before it is seen elsewhere. This prevents journals from being forced to make retractions due to small mistakes that could likely be missed by the human eye.

“Computers work harder, faster, and more accurately without tiring, making it much easier to detect image issues like size, location, orientation, overlap, partial duplication or any combinations of these,” explained Dr. Dror Kolodkin-Gal, Founder of Proofig Ltd.

AI in Manuscript Writing

AI-powered language and English editing tools can improve both the overall manuscript preparation experience and researchers' confidence in their work. Emerging technology can support researchers by helping them overcome basic spelling, grammar, and language issues, thus enhancing the chances of your paper being accepted by a journal's editor. English editing and writing tools like Paperpal are based on robust AI algorithms that refer to millions of



scientific research papers to determine patterns and assist with tasks such as language editing and technical checks.

Many software tools on the market use deep learning models to detect mistakes in citations, stylistic issues, and science-related language problems. Some AI applications even offer quality scores before and after manual editing to evaluate the proficiency of copyeditors.

While AI writing tools have been around for a while, and are relatively easy to find with a quick Google search, many of them cannot be tailored to a specific expert's industry or subject. Academics using these universally known tools may not find it as effective as they do not receive corrections or recommendations based on their specific discipline or subject area. While these tools can identify minor grammatical errors, they're unlikely to offer researchers more complex editing improvements. Without highlighting these areas of development, it's difficult to instill confidence in a researcher's writing skills and increase their chances of getting accepted by top journals.

Real-time AI assistive writing tools can reduce such issues by assisting authors and giving them the opportunity to develop their writing skills for future papers. To help researchers improve their chances of catching language errors early on, Paperpal analysed

2,674 pre-edited research papers to find the most common mistakes in manuscripts.

In the research papers analysed, the tool identified 134,105 errors, with an average of 50 mistakes per manuscript. Grammar accounted for 43% of the flagged errors, with article usage, preposition usage, and verb form being the top three grammar issues. This is primarily due to the fact that many researchers haven't been offered a refresher on grammar since compulsory education, which makes identifying grammatical mistakes rather difficult. Identifying grammatical mistakes is particularly difficult for non-native English speakers, or individuals with dyslexia, where the writing and editing stages can be even more challenging.

In the Paperpal analysis, 28% of the errors found were issues with readability. Common issues related to readability include redundancies, comma splicing, conciseness and rephrasing suggestions.

Another 19% of identified errors related to mechanics and style. Punctuation emerged as the most common problem area, accounting for 43% of the mechanics and style corrections. Other mechanics and style errors included corrections in capitalisation, conventions, hyphenation, and spacing. A careful proofread and reading the paper out loud can help authors eliminate such avoidable mechanics and



style issues. It can also prove helpful with typos such as ‘its’ and ‘it’s’, ‘there’ and ‘their’, and so on.

While most academics are well-versed in the correct language to be used in their research fields, it was still among the top types of errors. For example, Paperpal flagged 13,598 vocabulary recommendations, which amounted to around 10% of identified errors, so this is one aspect that is important to double check before submission.

Using an AI tool can be beneficial in finding such errors, identifying areas for improvement so researchers can go over the basics of writing and refresh the standard grammatical rules. If researchers find themselves making the same mistakes in multiple pieces, this AI assistant can make it easier to look out for and fix such errors.

How do AI Tools Perform?

Dora Alexopoulou, Principal Research Associate at The University of Cambridge, recently released a report titled Comparison of Automated English Editing Tools. She compared seven different writing tools – Paperpal, InstaText, Grammarly, AJE, Trinka, Writefull and QuillBot – and evaluated their performance with regards to enhancing academic content. Each of the seven language tools was tested on three 500-word sample texts from separate humanities, life sciences, and physics papers. They were then evaluated on the number and type of language edits suggested, with corrections being classified into spelling, punctuation, grammar, and word choice suggestions. When assessing each tool’s performance, the report also factored in the rate of acceptance and the extent to which these corrections coincided with edits done by professional human editors.

The report found that “different tools target different types of corrections and show varying performance across the different categories”.⁵ The differences in corrections and rate of acceptance reflected the user experience of each tool. For example, a tool that mostly focused on corrections for word choice and clarity enhances the readability, while a focus on grammar improves language quality. However, a large volume of irrelevant edits means that most of the user’s time will be wasted rejecting suggestions, which could affect their perception of the tool’s usefulness.

The report concluded that with 149 editing prompts, of which 38.9% were accepted, Paperpal provided a high number of alternative suggestions (words and phrases), which were in line with suggestions made by human editors, to help enhance the language and readability of the texts.

The Future of Scientific Writing

Advanced AI-powered tools are set to change the way researchers develop their papers, helping them overcome some of the challenges associated with scientific publishing. AI writing tools have been designed to help authors polish their academic writing, minimise editing time, and reduce the risk of desk rejection due to language issues. These tools can also help lessen the load for journal editors, who can focus on evaluating the merit of the research findings, rather than be distracted by errors in the writing.

Rejection is never easy and it’s a verdict that can be difficult for many academics to overcome. It can damage an academic’s confidence, particularly when combined with the competition in the scientific community and the immense pressure to “publish or perish”. However, with the growing popularity of AI writing assistants, researchers have the tools that empower them to overcome desk rejection and ensure their paper meets all the criteria needed for successful publication.

REFERENCES

1. Else, H. How a torrent of COVID science changed research publishing – in seven charts. *Nature* (December 2020). Available at <https://www.nature.com/articles/d41586-020-03564-y>
2. Takahashi K. Pleasure of discovery: why we love research. *Journal of Orthopedic Science*. (2013).
3. Khadilkar, S.S. Rejection Blues: Why Do Research Papers Get Rejected? *National Library of Medicine*. (2018).
4. Biopharma digital transformation: Gain an edge with leapfrog digital innovation 2021, *Deloitte*. Available at: <https://www2.deloitte.com/us/en/insights/industry/life-sciences/biopharma-digital-transformation.html>
5. Alexopoulou, D. Comparison of Automated English Editing Tools. *University of Cambridge*. (2022).

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