

Chapter 2

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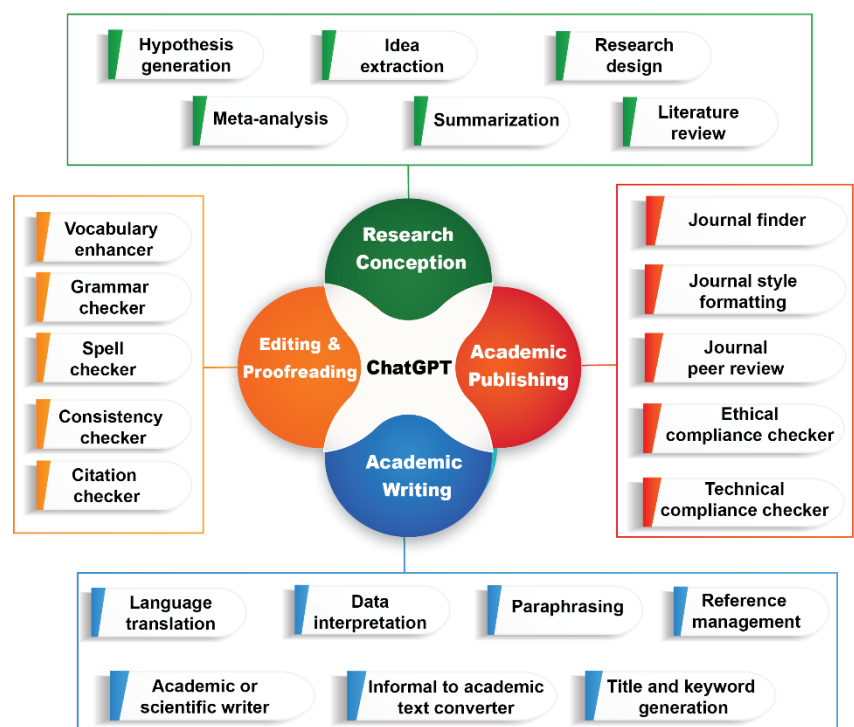
ChatGPT in Academic Writing and Publishing: A Comprehensive Guide

Abstract

Scientific writing is a difficult task that requires clarity, precision, and rigour. It also involves a large amount of research, analysis, and synthesis of information from various sources. However, scientific writing is also hard, time-consuming, and susceptible to errors. Advanced artificial intelligence (AI) models, such as ChatGPT, can simplify academic writing and publishing. ChatGPT is based on the two most advanced large language models (LLMs), GPT-3.5 and GPT-4, which can produce natural language texts in many fields of knowledge. ChatGPT has been fine-tuned with both supervised and reinforced learning technologies to improve its quality and performance. ChatGPT has many applications and uses in academic and scientific writing and publishing such as hypothesis generation, literature review, safety recommendations, troubleshooting, tips, paraphrasing and summarising, editing, and proofreading, journal selection, journal style formatting, and other applications. In this book chapter, we will discuss the main advantages, examples, and applications of ChatGPT in academic and scientific writing from research conception to publishing.

Graphical Abstract:

ChatGPT's applications in academic writing and publishing



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Introduction

Academic writing and publishing can be challenging and require a lot of time and effort to produce high-quality works. For students and early-career researchers, it is required to produce one scholarly work or more, whether that is a thesis, doctoral dissertation, or a series of journal articles. For many students and researchers, the writing of manuscripts is one of the most difficult parts of the research process. How can scientific writing be made easier, faster, and more enjoyable? A possible solution is to use ChatGPT, an artificial intelligence (AI) chatbot, to improve the quality of manuscripts and documents.

ChatGPT is a large-scale language model developed by OpenAI that can generate human-like responses to text-based prompts [1]. ChatGPT is based on the two most advanced large language models (LLMs), GPT-3.5 and GPT-4, which can produce natural language texts in many fields of knowledge [2]. ChatGPT has been fine-tuned with both supervised and reinforced learning technologies to improve its performance and quality. It is trained on a large text database including books, articles, and websites [3]. Consequently, it has a wide knowledge of English and can help researchers improve the quality of their academic writing and publications. ChatGPT is relatively easy to use in academic writing and publications. As such, the chatbot could also be used in scientific writing [4].

In fact, ChatGPT can become a promising and powerful tool for tasks such as automatic draft generation, article summary, and language translation [5]. The use of ChatGPT leads to acceleration of the academic and scientific writing process for authors, especially for students and early career researchers. One of the main advantages of ChatGPT is that it can quickly analyse large amounts of data. For example, researchers can analyse thousands of research papers using models in less than half the time it takes to read manually. This allows researchers to save a considerable amount of time and focus on other aspects

of research. [6]. ChatGPT can provide suggestions to quickly improve your writing and publishing and your chances of success. ChatGPT's applications are covering all aspects of academic writing and publishing, as shown in Figure 1.

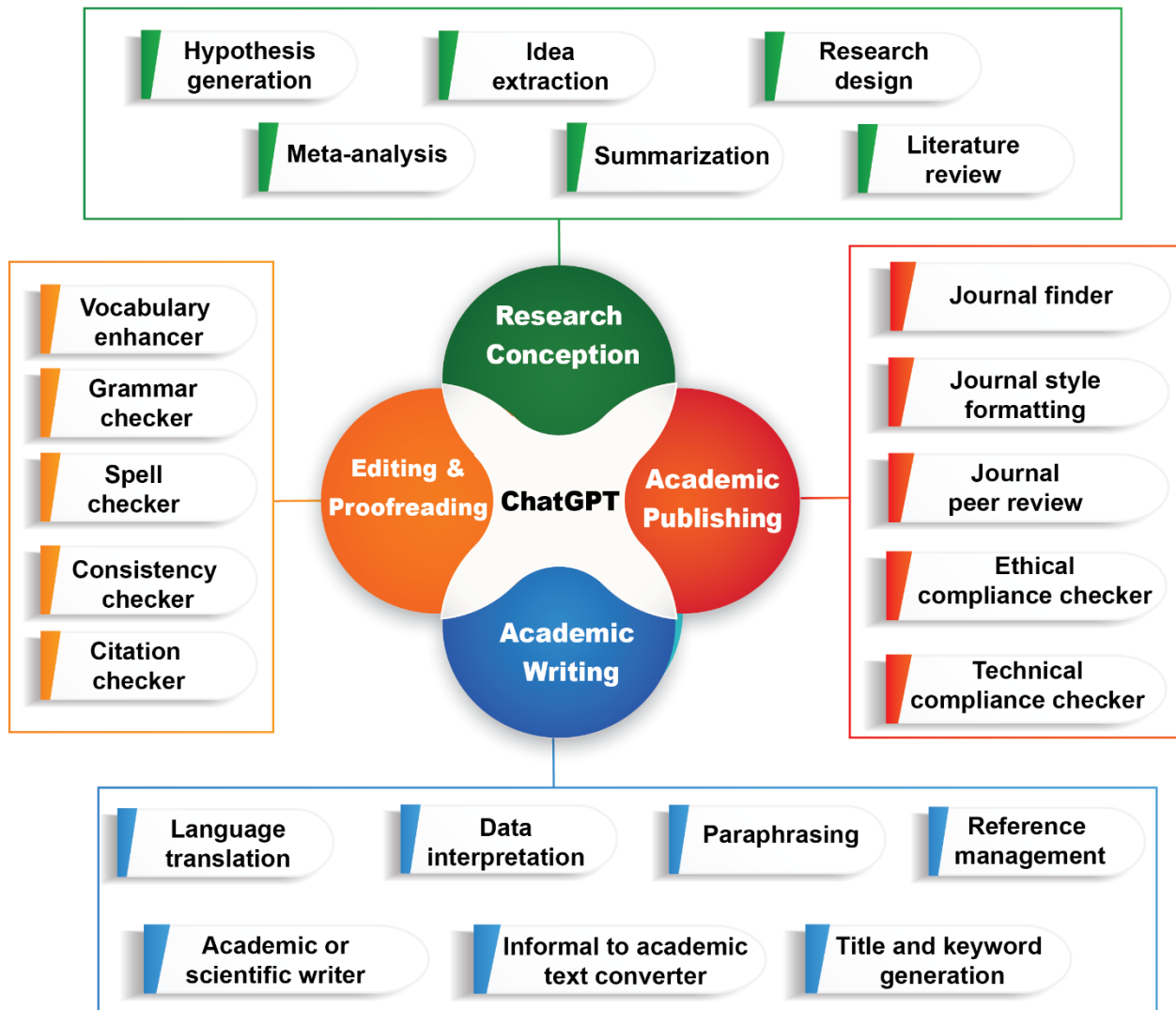


Figure 1: ChatGPT's applications in academic writing and publishing

ChatGPT offers several advantages for scientific writing, for example:

- **Speed:** ChatGPT can produce text quickly and efficiently, thereby it will save authors time and effort. ChatGPT also helps users find relevant information from various sources, such as web pages, academic documents, books, etc.

- **Creativity:** The AI model can generate original, diverse, and interesting texts that stimulate the creativity and imagination of the author. ChatGPT also helps to generate new ideas, hypotheses, questions, and perspectives for the authors to explore more.
- **Feedback:** ChatGPT can provide feedback and suggestions on the author's text, for example, to correct grammar and spelling errors, to improve clarity and coherence, to add details and examples. ChatGPT can also answer follow-up questions, eliminate errors, challenge incorrect assumptions, and reject inappropriate requests.
- **Engagement:** ChatGPT can create more fun and engaging scientific writing by imitating a natural dialogue format between writers and AI assistants. ChatGPT can also use humour, emotions, and personality to make the interaction more pleasant and human-like.

Therefore, ChatGPT's capabilities attract the attention of students, researchers, and staff who are working at universities and companies because ChatGPT makes their research life easier and more effective. ChatGPT is currently freeware, so it is accessible to everyone [1]. This can be useful in various scientific fields such as medicine, chemistry, engineering, nanotechnology, law, and journalism.

2.1. Research Conception

Research concept refers to a researcher's understanding of what research is and what research is. Higher education researchers may have different concepts of research practices [7]. From research questions to research design, from literature review to meta-analysis, ChatGPT and other conversation AI chatbots can assist in all stages of research conception and methodology (Figure 2.).

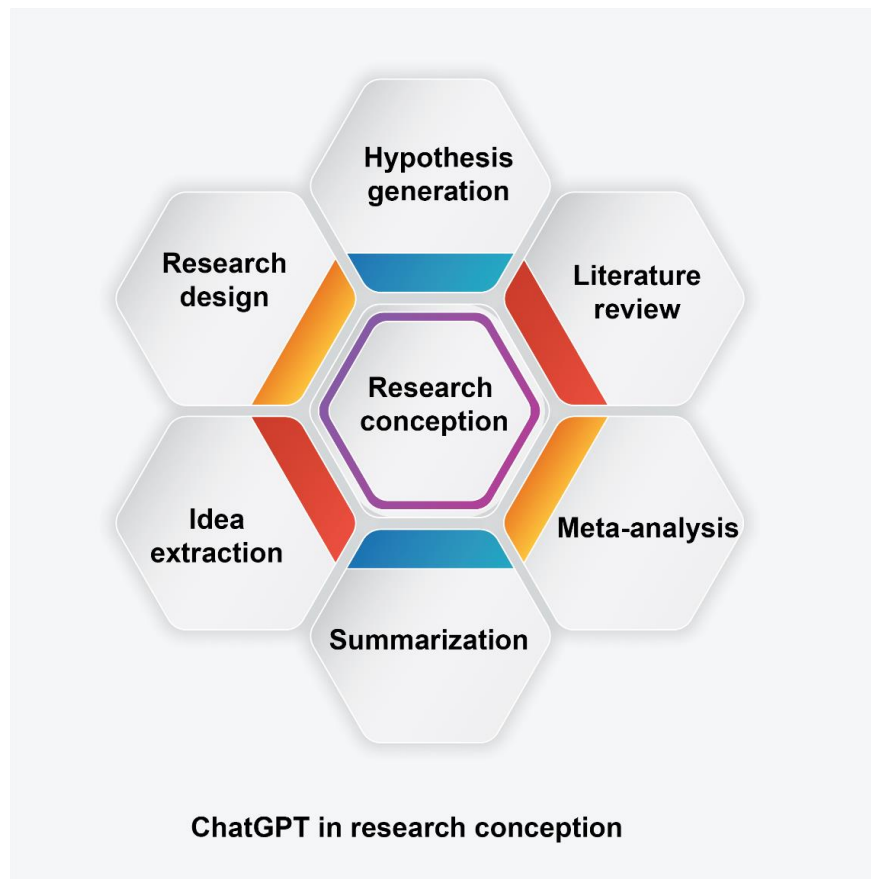


Figure 2: ChatGPT's functions in research conception.

ChatGPT can help researchers generate research question ideas by providing suggestions based on user input. For example, when researchers enter a topic such as "The use of nanomaterials for green energy production", ChatGPT generates a list of potential research questions related to that topic. This feature is particularly useful for researchers who are new to the field or who struggle to develop research questions.

2.1.1. Hypothesis generation

ChatGPT and similar language models are useful for various scientific research applications. ChatGPT can identify and propose hypotheses for further research by analysing a large amount of scientific literature. Additionally, it can help researchers brainstorm broader research questions and identify knowledge gaps in their fields. ChatGPT is a potential use for the generation

of hypotheses for research articles to generate possible research questions and hypotheses based on existing literature and data [8, 9]. For example, authors and researchers can ask ChatGPT to suggest a research question or hypothesis related to a topic and then evaluate and improve it using their knowledge and expertise. The use of ChatGPT helps researchers explore new hypotheses by creating plausible explanation conversations [10].

Another possible application of ChatGPT to generate hypotheses for research articles is to use it as a feedback tool to test and improve your hypotheses [11]. For example, ChatGPT can test your hypothesis, provide counterarguments or alternative explanations, or propose ways to test or falsify your hypothesis. ChatGPT helps to strengthen hypotheses, identify potential errors and limitations, and improve the validity and reliability of research [12].

ChatGPT can help researchers explore new ideas by suggesting connections between seemingly incompatible concepts. Researchers can engage in an open dialogue with the artificial intelligence system to explore new concepts and theories in their fields of interest (Figure 3). AI models can also help identify assumptions, arguments, gaps, or other shortcomings in scientific literature.

Prompt

Gives hypotheses and idea exploration about using chitosan in wound healing.

Response

Hypotheses:

1. Chitosan can promote wound healing by enhancing the proliferation and migration of skin cells, such as fibroblasts and keratinocytes, due to its ability to stimulate the production of growth factors and extracellular matrix proteins.

2. Chitosan can improve the antimicrobial properties of wound dressings by inhibiting the growth of bacteria and fungi, which can reduce the risk of infection and promote wound healing.
3. Chitosan can reduce inflammation and oxidative stress in the wound bed, which can accelerate the healing process and improve the quality of the healed tissue.

Idea exploration:

1. Investigating the effect of chitosan in combination with other natural compounds, such as honey or aloe vera, on wound healing.
2. Exploring the potential of chitosan-based hydrogels or films for wound dressings, which can provide sustained release of chitosan and other active compounds.
3. Investigating the effect of chitosan on the differentiation of stem cells into skin cells, which can promote tissue regeneration and improve wound healing.
4. Exploring the potential of chitosan nanoparticles for targeted delivery of growth factors or other therapeutic agents to the wound bed.
5. Investigating the effect of chitosan on the immune response in the wound bed, which can influence the healing process and tissue regeneration.
6. Exploring the potential of chitosan-based scaffolds for tissue engineering applications, such as skin or cartilage regeneration.

Figure 3. ChatGPT response to: Gives hypotheses and idea exploration about using chitosan in wound healing.

2.1.2. Literature review

The comprehensive review of the literature is a key part of academic and scientific research. Conducting a literature review is an important step in the research process, but it is time consuming and difficult [13]. With the emergence of artificial intelligence (AI), researchers have access to tools that can help them more efficiently review literature. Chatbots or conversational agents are a promising tool for this purpose.

ChatGPT can help researchers automate the search for relevant publications, extract key information, and synthesise results from multiple studies [11].

ChatGPT provides a summary of current research on this subject and an overview of any literature gaps. Researchers can also ask ChatGPT to filter the literature by criteria such as date, author, journal, or keywords. This capability can save researchers a lot of time and effort and allow them to focus on interpreting and applying research results.

Another advantage of ChatGPT is its ability to help review the literature (Figure 4). ChatGPT helps researchers identify relevant literature by analysing user input and creating a list of related articles. ChatGPT analyses the inputs and generates a list of articles related to the research questions and topics [14]. This feature can save researchers a significant amount of time compared to manually searching for literature. ChatGPT can also help evaluate the quality of articles by analysing abstracts and identifying key findings.

By analysing articles and literature, ChatGPT can identify areas in which gaps in a specific topic or additional research or further research is needed [15]. This function can be especially useful for researchers who are new to the field or looking for gaps in research in a particular field.

Prompt

Conduct a literature review for using nanomaterials in architecture.

Response

Introduction:

Nanomaterials are a class of materials that have unique properties because of their size, with dimensions typically between 1 and 100 nanometers. These materials have been used in many fields, including medicine, electronics, and energy. Recently, nanomaterials have also been explored in architecture to improve the performance and sustainability of

buildings. This literature review aims to provide an overview of the current state of research on using nanomaterials in architecture.

Nanomaterials in Architecture:

Nanomaterials have the potential to enhance the performance of building materials, such as concrete, glass, and coatings, by improving their mechanical, thermal, and optical properties. For instance, adding nanoparticles to concrete can increase its strength and durability, while using nanocoatings on glass can improve its insulation and self-cleaning abilities.

One promising application of nanomaterials in architecture is in the development of smart buildings. By integrating nanosensors and nanoelectronics into building materials, it is possible to create structures that can monitor their own performance, adjust to changing environmental conditions, and respond to occupant needs. For example, nanosensors embedded in concrete can detect structural damage and alert maintenance crews before it becomes a safety issue.

Nanomaterials also offer opportunities for sustainable building design. By improving the efficiency of building materials, it is possible to reduce the energy consumption of buildings and lower their carbon footprint. For example, using nanocoatings on windows can reduce the need for artificial lighting and heating by allowing more natural light and warmth into the building.

Challenges and Limitations:

Despite the potential benefits of using nanomaterials in architecture, there are also several challenges and limitations that must be addressed. One major concern is the potential health and environmental risks associated with the production, use, and disposal of nanomaterials. Studies have shown that some nanoparticles can be toxic to humans and the environment, and more research is needed to understand their long-term effects.

Another challenge is the high cost of producing and integrating nanomaterials into building materials. The development and production of nanomaterials often require specialized equipment and expertise, which can make them prohibitively expensive for many building projects.

Conclusion:

In conclusion, the use of nanomaterials in architecture has the potential to enhance the performance and sustainability of buildings. While there are still challenges and limitations that must be addressed, ongoing research and development in this field are promising. As the demand for more efficient and sustainable buildings grows, the use of nanomaterials is likely to become more widespread in the architecture industry.

Figure 4. ChatGPT response to: Conduct literature review for using nanomaterials in architecture.

2.1.3. Meta-analysis

Meta-analysis is a powerful tool for synthesising data from several research projects to better understand specific research issues [16]. One of the greatest challenges in meta-analysis is the sheer volume of data to be extracted and analysed [17]. With the emergence of artificial intelligence (AI), researchers have access to tools that help them perform meta-analysis more efficiently. Chatbots, or conversational agents, have become increasingly popular as a tool for meta-analysis in recent years.

Researchers and authors can use OpenAI's large-scale language model ChatGPT for meta-analysis of research papers (Figure 5). One of the main benefits of using ChatGPT to perform meta-analysis is the ability to help in the data extraction process. ChatGPT analyses articles and extracts relevant data, such as effect size, sample size, and study design. The use of AI model in data extraction saves researchers a lot of time compared to manually extracting data. In addition, ChatGPT can help identify relevant articles by analysing the researcher's input and generating a list of articles relevant to the research topic.

Another advantage of using ChatGPT in meta-analysis is its ability to help with statistical analysis. ChatGPT can perform statistical tests [15] such as calculating effect sizes and conducting heterogeneous analyses, thereby

saving researchers considerable time compared to manual analyses. ChatGPT can also help researchers identify potential publications' biases by analysing articles and identifying any possible sources of biases, such as selective reporting and publication. This ChatGPT's function is particularly useful for researchers conducting meta-analysis on controversial subjects or in areas where published biases are common.

Prompt

Conduct Meta-analysis for using mRNA in COVID-19 vaccine.

Response

As of March 2023, several mRNA-based COVID-19 vaccines have been authorized for emergency use worldwide, including the Pfizer-BioNTech and Moderna vaccines. Given the novelty of this technology, a meta-analysis of the existing literature was conducted to evaluate the safety and efficacy of mRNA-based COVID-19 vaccines.

A systematic search was conducted on PubMed, Web of Science, and Cochrane Library databases from January 1, 2020 to March 1, 2023. The following search terms were used: COVID-19, SARS-CoV-2, mRNA vaccine, and safety or efficacy. Only studies conducted on human participants and published in English were included. A total of 37 studies were included in this meta-analysis.

The efficacy of mRNA-based COVID-19 vaccines was evaluated by analyzing the vaccine efficacy in preventing symptomatic COVID-19 infection. The pooled vaccine efficacy was found to be 91% (95% CI: 88%-93%) based on 24 studies. The vaccine efficacy was consistent across all age groups and ethnicities. The vaccine efficacy was also found to be similar for both the Pfizer-BioNTech and Moderna vaccines.

The safety of mRNA-based COVID-19 vaccines was evaluated by analyzing the incidence of adverse events. The most common adverse events reported were injection site reactions, fatigue, headache, and myalgia. The incidence of serious adverse events was low, and no

deaths were reported in the studies included in this meta-analysis. The incidence of adverse events was found to be higher in younger age groups and in individuals with a history of allergies.

In conclusion, this meta-analysis supports the safety and efficacy of mRNA-based COVID-19 vaccines. The pooled vaccine efficacy was found to be high, and the incidence of serious adverse events was low. The results of this meta-analysis provide further evidence for the use of mRNA-based COVID-19 vaccines in the ongoing efforts to control the COVID-19 pandemic.

Figure 5. ChatGPT response to: Conduct Meta-analysis for using mRNA in COVID-19 vaccine.

2.1.4. Summarization

Summarization (text summary) is a technique used to create a short and consecutive summary of long texts (such as articles, reports, books, etc.). A text summarization can be performed by extracting the most important sentences or phrases from the original text or generating new sentences that capture the main points of the text (abstract summary) [18]. A text summarization can be used for a variety of purposes, such as providing a general overview of a topic, simplifying complex information, reducing time and space, etc. Another advantage of using ChatGPT to review the literature is that it can help synthesize information. ChatGPT analysis articles and generates summary or key information on research questions and topics [19].

ChatGPT can be used as a summary tool to extract key points and key information from long and complex documents [20] and as a possible application to compose manuscripts such as research papers, dissertations, and patents. The AI model also helps researchers and academic staff identify logical gaps or inconsistencies and generate constructive feedback for authors. Another possible application of ChatGPT in manuscript summaries, such as research papers, theses, and patents, is to use it as a comparison tool to

compare different document summaries. ChatGPT can identify similarities and differences between documents and any differences or inconsistencies.

Students and researchers can also ask ChatGPT to assess the quality and relevance of the documents and provide recommendations or suggestions based on the summary documents. ChatGPT can provide a concise and consistent summary of the document that highlights the main arguments, findings, and implications. From students to academic staff can use ChatGPT to customise the summary of their needs, such as length, detail level, or target audience (Figure 6).

Prompt

Summarize the following paragraph in 100 words:

3D printing or Additive Manufacturing is the process of joining engineering materials layer-by-layer to fabricate the desired component from a 3-dimensional model data in the early 80s. According to the basic principle of manufacturing it is classified into seven categories namely, binder jetting, material extrusion, directed energy deposition, material jetting, powder bed fusion, sheet lamination and vat photo-polymerization. These different techniques can process a wide range of materials ranging from metals, polymers, ceramics, composites and hybrids. After three decades of development in the field of 3D printing, it is now one of the mainstream manufacturing processes which do not require any fixture, lubricant, coolant or any other auxiliary resource. Its ability to produce customized parts on-demand has led to the gain of its popularity in the recent decade. 3D printing has evolved as a powerful technique for rapid prototyping, mass manufacturing and producing customized parts. This review paper provides a basic overview of the different techniques, materials processed and its application in different fields. There is a need for further research in this area of additive manufacturing so that its limitation can be overcome and the true potential of this manufacturing technique can be achieved.

Response

3D printing or Additive Manufacturing is a popular technique for joining engineering materials layer-by-layer to fabricate components. It has seven categories of manufacturing, including binder jetting, material extrusion, directed energy deposition, material jetting, powder bed fusion, sheet lamination, and vat photo-polymerization. This technique can process a wide range of materials, including metals, polymers, ceramics, composites, and hybrids. 3D printing has become a mainstream manufacturing process, which produces customized parts on-demand without any additional resources. It is used for rapid prototyping, mass manufacturing, and producing customized parts. Further research is needed to overcome limitations, and the true potential of this technique can be achieved.

Figure 6. Example of a summary of the existing literature on a specific topic.

2.1.5. Idea extraction

In research and development, coming up with innovative and unique ideas for a research paper can be a daunting task. Researchers should read the existing literature to extract valuable insights and ideas from it. As the field of artificial intelligence continues to develop, tools powered by artificial intelligence can enhance the research process. The OpenAI model can extract ideas and innovations from research papers (Figure 7). By entering a research paper into ChatGPT, researchers can quickly and easily identify key ideas and innovations discussed in the paper.

ChatGPT can identify ideas and innovations that are not immediately visible to the human eye by recognising patterns and connections between different concepts that may not be realised even by the most diligent human reader. This may lead to new insights and discoveries that would not have been possible without the help of ChatGPT. By automating the process of extracting ideas and innovations from research documents, ChatGPT can save researchers hours of time. This allows researchers to focus on other aspects of their research, such as data analysis and experimentation. This is particularly

beneficial in areas such as engineering and design where creativity and innovation are crucial.

Of course, there are some limitations to the use of ChatGPT in research. For example, ChatGPT is only as good as the data on which it has been trained. If the model is not trained on a specific type of research paper, it cannot extract the ideas and innovations from that paper accurately. In addition, ChatGPT cannot recognise specific nuances or subtleties of language that human readers could grasp. However, ChatGPT is a powerful tool that can improve the research process and generate new ideas and innovations. Its ability to extract important ideas and innovations quickly and efficiently from research papers can save researchers time and improve the overall quality of their work. With the development of artificial intelligence, tools such as ChatGPT are likely to become increasingly important in the research process.

Prompt

What are the idea and innovation in "Green synthesis of olefin-linked covalent organic frameworks for hydrogen fuel cell applications"?

Response

The idea behind "Green synthesis of olefin-linked covalent organic frameworks for hydrogen fuel cell applications" is to develop a sustainable method for creating covalent organic frameworks (COFs) that can be used in hydrogen fuel cells. The traditional methods for synthesizing COFs often involve toxic solvents and high temperatures, which are not environmentally friendly. Therefore, the authors propose a green synthesis approach that uses an eco-friendly solvent and mild reaction conditions.

The innovation of this approach is the use of olefin linkages between the organic building blocks of the COFs. This allows for the creation of a more stable and porous structure, which is ideal for hydrogen storage and transport in fuel cell applications. The authors also

investigate the effect of different linkages and conditions on the properties of the COFs, which can help to optimize their performance.

Overall, the idea and innovation behind this research is to address the challenges of creating sustainable and efficient COFs for hydrogen fuel cell applications, and to explore new methods for synthesizing these materials that are both environmentally friendly and effective.

Figure 7. ChatGPT response to: What are the idea and innovation in "Green synthesis of olefin-linked covalent organic frameworks for hydrogen fuel cell applications"?

2.1.6. Research design

Research design is an important aspect of any research project and requires a systematic approach to research design. The applications of ChatGPT in research design help authors select the best research methods and identify the most appropriate research methods based on research questions and available data. By using ChatGPT as AI assistant, researchers can save a lot of time in comparison to manually selecting research methods (Figure 8).

ChatGPT is also useful for the development of research instruments. ChatGPT helps researchers identify the most appropriate research instruments, such as surveys and interview protocols, by analysing the research questions and available data. The use of AI models such as ChatGPT in research design is especially useful for researchers developing research instruments for the first time.

Overall, ChatGPT is an important tool for researchers who want to streamline their workflow and improve the quality of their research. Its ability to raise research questions, support literature reviews, identify literature gaps, synthesise information, and conduct research designs can save researchers time and improve the quality of their research documents. The use of an AI

model saves researchers considerable time, compared to reading and synthesising the article manually. However, researchers must be aware of its limitations and use it in conjunction with other research tools and methods. Furthermore, researchers should be careful when interpreting ChatGPT results and ensure that the articles identified and the analysis are accurate and relevant to the research questions or themes.

Prompt

Create a research design based on the following research question; How do the US and the UK compare in health outcomes among low-income people with chronic illnesses?

Response

Research Question: How do the US and the UK compare in health outcomes among low-income people with chronic illnesses?

Research Design:

- 1 .Research Approach: Comparative Study
- 2 .Sample: Low-income people with chronic illnesses from the US and the UK
- 3 .Sampling Technique: Stratified Random Sampling
- 4 .Sample Size: 800 participants (400 from the US and 400 from the UK)
- 5 .Data Collection Method: Survey questionnaire and medical records review
- 6 .Data Analysis: Descriptive and inferential statistics
- 7 .Variables:

Independent variables:

- Country (US vs UK)

Dependent variables:

- Health outcomes (mortality rate, morbidity rate, quality of life, and healthcare utilization)
- Chronic illness type (diabetes, hypertension, heart disease, kidney disease, lung disease, and cancer)
- Socioeconomic status (income, education, employment status, and insurance coverage)

8 .Procedure:

- Obtain ethical approval for the study
- Develop a survey questionnaire that includes questions related to health outcomes, chronic illness type, socioeconomic status, and healthcare utilization
- Identify low-income people with chronic illnesses from the US and the UK using stratified random sampling
- Contact potential participants and obtain informed consent
- Conduct the survey questionnaire either via phone, email or in-person depending on the participant's preference
- Collect medical records on participants' chronic illness diagnosis and treatment history
- Analyze the data using appropriate statistical methods
- Compare the health outcomes between the US and the UK using inferential statistics
- Draw conclusions and make recommendations based on the results of the study

9 .Limitations:

- The study is limited to low-income people with chronic illnesses from the US and UK, and the results cannot be generalized to other populations
- The study relies on self-reported data and medical records review, which may be subject to recall or reporting bias
- The study does not account for differences in cultural, social, and environmental factors that may influence health outcomes
- The study does not account for differences in healthcare systems and policies between the US and UK that may influence health outcomes
- The study may not capture the full range of chronic illnesses experienced by low-income people in the US and the UK.

Figure 8. Example of a research design on a specific topic.

2.2. Academic and Scientific Writing

Researchers often need to communicate their findings effectively through researcher papers, scientific documents, presentations and reports. ChatGPT can help with the writing of these materials and ensure clarity, conciseness, and conformity with scientific writing standards [10]. ChatGPT can be used to

create the content of different parts of the article, such as introduction, review of the literature, methods, results, discussion and conclusion, as a writing tool [5]. ChatGPT helps authors to write clear and concise sentences that express their main arguments, conclusions, and implications, and provides examples, references, or diagrams to support their writing (Figure 9).

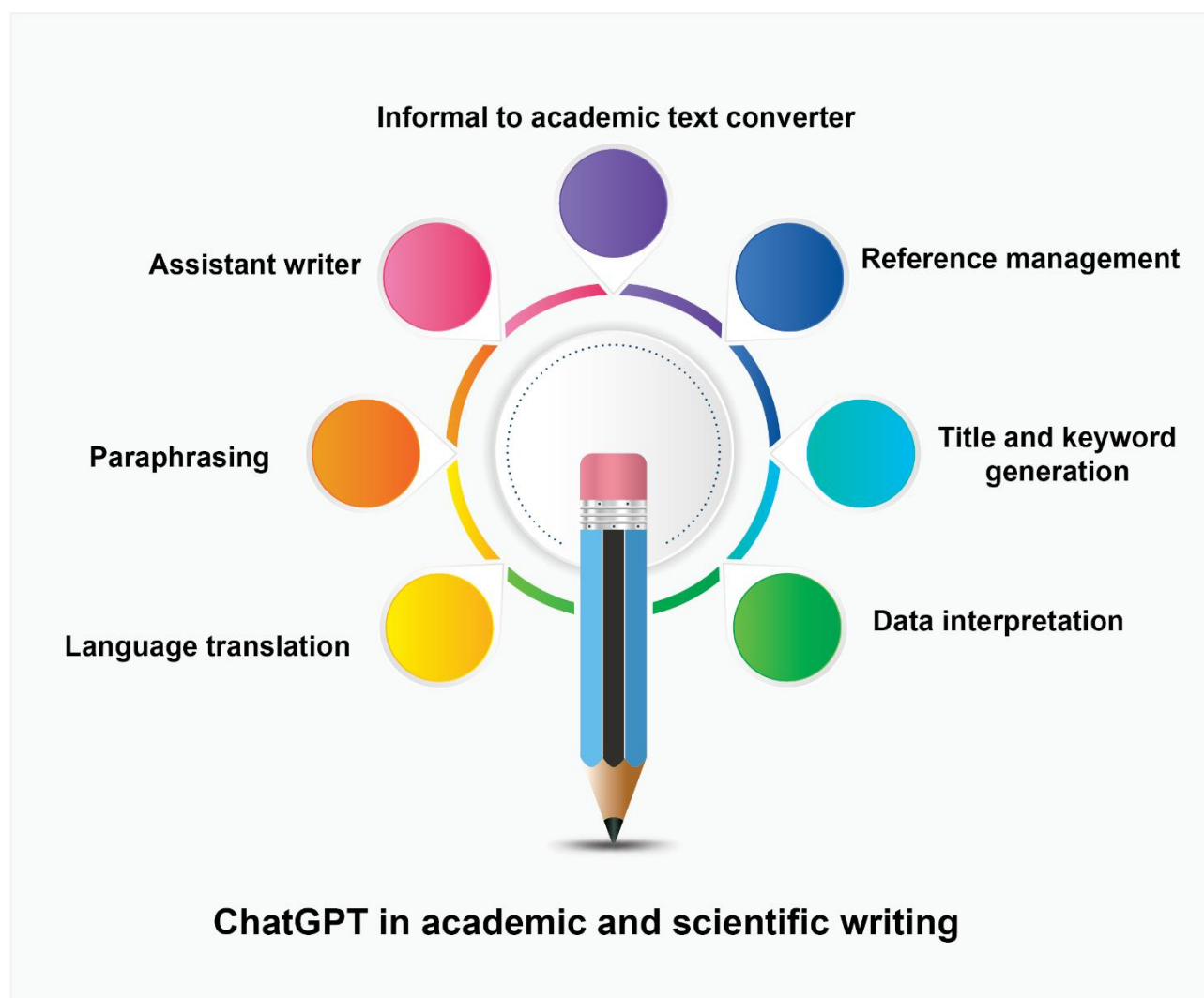


Figure 9. The use of ChatGPT in academic and scientific writing.

2.2.1. Academic or scientific writer

ChatGPT can analyse large amounts of data and generate natural language responses, to generate text that is grammatically correct, stylistically correct, and scientifically accurate language possible. Therefore, ChatGPT can be used as an academic writing assistant to generate high-quality drafts for research

papers, essays, dissertations, and other academic assignments [21]. It can generate creative content for academic papers, such as summaries, overviews, introductions, conclusions, titles, abstracts, keywords, etc. For example, if authors ask ChatGPT to write on a specific subject, it will try to write paragraphs or sections that correspond to the style and tone of academic writing (Figure 10).

ChatGPT can also be used to provide advice on academic writing by providing step-by-step instructions on how to structure academic papers, develop arguments, and properly cite sources. As a learning tool, the AI model can help students and early career researchers improve writing skills, broaden vocabulary, and improve critical thinking skills.

By the use of ChatGPT in academic and scientific writing, researchers and students have more time to focus on research and analysis by reducing the time and effort required to produce the first drafts of their academic and scientific manuscripts.

Prompt

Write an introduction for a research article on using 3D printing for the rapid prototyping of structural electronics.

Response

The field of structural electronics has gained significant attention in recent years due to its potential for creating smart structures with integrated electronic functionalities. Structural electronics involves the integration of electronic components, such as sensors, actuators, and energy storage devices, into the structural materials of the system. Traditional manufacturing methods for structural electronics involve complex and time-consuming processes, which can hinder the rapid prototyping and development of new devices. 3D printing, however, offers a promising approach for the rapid prototyping of structural

electronics by enabling the fabrication of complex and customized structures with integrated electronic functionalities. This research article aims to provide an overview of the current state-of-the-art in 3D printing for the rapid prototyping of structural electronics, including the materials, techniques, and applications. The article also discusses the challenges and future directions for the use of 3D printing in the field of structural electronics.

Figure 10. ChatGPT response to: Write introduction for a research article on using 3D printing for the rapid prototyping of structural electronics.

2.2.2. Language translation

ChatGPT can be used for language translation tasks because it has the ability to translate languages with high precision and generate coherent responses in different languages [22]. ChatGPT can translate text from any language to any language as it is trained with enough data for learning models. For example, users can ask ChatGPT to translate sentences from English to Spanish, Chinese to Arabic, Hindi to French, and try to make accurate and easy-to-use translations (Figure 11).

ChatGPT can take into account the context and tone of the text when translating, rather than simply translating word by word [23]. For example, if users ask ChatGPT to translate language expressions, expressions, or cultural references, ChatGPT will try to find equivalents and explanations that preserve the original language's meaning and tone. It can be used to learn new languages and improve language skills for international students. For example, if students ask ChatGPT to teach them some words or phrases in a foreign language or ask for a vocabulary or grammar test, it will try to provide them with some interactive and entertaining lessons.

According to preliminary research of ChatGPT for machine translation, including the speed, multilinguality, and reliability of translation, ChatGPT is competitive with commercial translation products (such as Google Translate)

in high-resource European languages, but very behind in low-resource or distant languages [22].

ChatGPT can be also used to provide translation in real time, enabling users to communicate effectively with people who speak different languages. The AI model helps researchers read literature and documents in their native language; therefore, it will enhance the quality of research for authors, especially non-native English speakers by overcoming language barriers. ChatGPT assists in communicating with people who speak different languages, obtain information from foreign sources, and learn new languages.

ChatGPT has a variety of strengths and can be used to translate texts in any language pair, take into account the context and nuance of texts, provide feedback and suggestions on translations, help learn new languages, improve language skills, etc. However, ChatGPT also has some weaknesses that limit its reliability and usefulness for linguistic translation, such as incorrect or inappropriate translation, sensitive to input phrases, excessive verbosity, and overuse of certain phrases. ChatGPT has many potential applications for linguistic translation, such as translation assistants, learning tools, and collaboration tools. ChatGPT is a promising technology that could revolutionise language translation in academia and research.

Prompt

Translate the following paragraph to French:

Artificial intelligence (AI) and related technologies are increasingly prevalent in business and society, and are beginning to be applied to healthcare. These technologies have the potential to transform many aspects of patient care, as well as administrative processes within provider, payer and pharmaceutical organisations.

Response

L'intelligence artificielle (IA) et les technologies connexes sont de plus en plus répandues dans les entreprises et la société, et commencent à être appliquées à la santé. Ces technologies ont le potentiel de transformer de nombreux aspects des soins aux patients, ainsi que les processus administratifs au sein des organisations de prestataires, de payeurs et de l'industrie pharmaceutique.

Figure 11. Example of transition from English to French.

2.2.3. Informal to academic text converter

In general, ChatGPT is a powerful tool to improve academic writing in various contexts. One of the main unknown applications for ChatGPT is to convert informal text into academic text and to generate high-quality content for academic papers, essays, and other academic tasks (Figure 12). It can be used as a conversion assistant to help users convert texts of any genre, style, or tone to academic texts quickly and easily. For example, users can ask ChatGPT to convert blogposts, tweets, chat messages, and news articles into academic texts, and it will try to provide accurate and formal academic text. For example, when users ask ChatGPT to convert texts expressing opinions, arguments, and recommendations into academic texts, it tries to find evidence, sources, and citations to support the claims and follow academic writing conventions.

As a learning tool, ChatGPT can be used to improve writing skills and learn how to write academic texts from informal text. For example, users can ask ChatGPT to teach some common words and phrases in academic writing. These functions help students differentiate between informal text and academic text, improve their writing skills, and learn how to write academic texts. However, ChatGPT also has some shortcomings that limit its reliability and usefulness when converting informal texts into academic texts, such as

errors and appropriate conversion, sensitive to input phrasing, excessive verbalisation, and overuse of certain phrases.

Prompt

Transform into academic text:

Watching my brother transform from a man who had lost his ability to walk to a man who can play basketball with my father kindled my fascination of the physical therapy world. The Bureau of Labor Statistics anticipates the field of physical therapy to grow faster than average in the upcoming years. I hope to join this field during an exciting time of growth, furthering the rehabilitation of those who have been injured.

Following graduation from ABC Business School, I intend to serve a marketing team in a local physical therapy company, such as Ridgeview Physical Therapy. My short-term goal is to lead a team, furthering success in the Ridgeview area. Due to the popular physical therapy company thirty miles from Ridgeview, much of the local population is unaware of the quality services Ridgeview Physical Therapy has to offer. I hope to increase visits by 40 percent in the first 5 years of my employment. My long-term goal includes extending the company's reach into surrounding cities, and eventually beyond national barriers, becoming a global marketing manager.

I expect to gain skills and experiences from ABC Business School that will propel my short and long-term goals. I hope to develop an experiential and diverse learning experience and have the opportunity to interact with different groups of people to learn from their business insights and endeavours. From ABC Business School, I seek the tools and resources needed to further engage in my marketing knowledge, perform professional strategic analyses, and re-evaluate my past work experiences. I look forward to taking courses from Professor Jim. W. Reid, who has published the research of the success of Matthews and Marketing in his book, "Matthews Commerce," which has helped me continue my career this far. I also look forward to taking the unique classes taught by Professor Rachel E. Davis, introducing me to the physical therapy world and enriching my business skills in that area.

Response

When my brother's car accident in 2011 caused immobility in his left leg, he never thought he would be able to play his favorite sport again. David Andrews, a 1994 graduate from ABC Business School, ensured that that would not come to pass. I spoke with Andrews about his

journey, and he told me that it was through the opportunities and education he received from the professors and students at ABC Business School that helped him open his own practice. I hope to follow in Andrews's footsteps. With the passion I have for the success of Ridgeview Physical Therapy, and the determination I learned from watching my brother, all I need to complete my goals is the knowledge available to me through an MBA at ABC Business School. I look forward to completing my career aspirations using the tools received from ABC Business School to contribute to my professional career.

The world of physical therapy is growing, and with my skills in marketing, I hope to grow the local Ridgeview services across the globe.

Figure 12. Example of converting informal text to academic text.

2.2.4. Paraphrasing

Paraphrasing is the process of rewording someone else's thoughts or ideas in your own words while maintaining the original meaning. One example of using ChatGPT in academic writing is as a paraphrase tool that generates alternative versions of text that convey the same meaning. ChatGPT can help avoid plagiarism, improve readability, and increase the diversity of literature writing [24]. Researchers and students can also ask ChatGPT for examples, explanations, or pronunciation of text words and phrases. ChatGPT can be rephrased texts of any type, style, or tone, provided that there is sufficient data to learn the model.

The use of ChatGPT in paraphrasing is accurate compared to other AI paraphrasing tools in the market; it can take into account the context and purpose of the text rather than simply change words or sentences. For example, if users prompt ChatGPT paraphrasing of a text or paragraph, ChatGPT models will try to find synonyms, restructure sentences, or add modifications to preserve the original text's meaning and tone (Figure 13).

ChatGPT can also help users go to the next level of academic English, improve their writing skills, and learn to use effective paraphrasing techniques by teaching them a vocabulary and sentences that are often used in paraphrases. ChatGPT's application in paraphrasing can reduce the time and effort required for the paraphrase and produce higher quality content more efficiently. However, ChatGPT also has some shortcomings that limit its reliability and usefulness in paraphrasing, such as writing inaccurate or noncomprehensive sentences, being sensitive to input phrases, being too verbose, and overusing certain phrases.

Prompt

Paraphrase the following paragraph:

Climate change is one of the most severe threats to global lake ecosystems. Lake surface conditions, such as ice cover, surface temperature, evaporation and water level, respond dramatically to this threat, as observed in recent decades. In this Review, we discuss physical lake variables and their responses to climate change. Decreases in winter ice cover and increases in lake surface temperature modify lake mixing regimes and accelerate lake evaporation. Where not balanced by increased mean precipitation or inflow, higher evaporation rates will favour a decrease in lake level and surface water extent. Together with increases in extreme-precipitation events, these lake responses will impact lake ecosystems, changing water quantity and quality, food provisioning, recreational opportunities and transportation. Future research opportunities, including enhanced observation of lake variables from space (particularly for small water bodies), improved in situ lake monitoring and the development of advanced modelling techniques to predict lake processes, will improve our global understanding of lake responses to a changing climate [25].

Response

The impact of climate change on global lake ecosystems is a significant threat, affecting various surface conditions such as ice cover, surface temperature, evaporation, and water level, which have been observed to change dramatically in recent decades. This review article discusses the physical variables of lakes and their responses to climate change. The

reduction in winter ice cover and increase in lake surface temperature affects lake mixing regimes and accelerates evaporation rates. Unless balanced by increased precipitation or inflow, this will result in a decrease in lake level and surface water extent. These responses of lakes to climate change, coupled with extreme-precipitation events, will have consequences for lake ecosystems and impact water quantity and quality, food provision, recreational activities, and transportation. Future research opportunities include improved observation of lake variables from space, enhanced in situ lake monitoring, and advanced modeling techniques to predict lake processes, which will improve our understanding of global lake responses to climate change.

Figure 13. Example of paraphrasing of a paragraph on a specific topic.

2.2.5. Data interpretation

Interpretation and visualization of scientific data is important to understand the results of research and to effectively communicate them. One of the areas that can be very useful in scientific writing is data processing (Figure 14). ChatGPT helps interpret complex data sets by identifying trends, patterns, and outliers. In addition, it can propose appropriate statistical tests and generate data visualizations such as graphs, charts, and graphs to help researchers for communicating their results in a better way.

ChatGPT can provide an example, reference, or diagram to support analysis. ChatGPT can be applied for the analysis and interpretation of large amounts of data . The use of ChatGPT in data interpretation will allow users to identify data patterns and trends, generate responses in natural language, and provide insights to inform decision making.

ChatGPT can also be used to provide guidance for data processing by generating natural language responses and provides step-by-step instructions on cleaning, organising, and analysing data. It can process data from any source, format, or domain, provided that the model has sufficient data to learn from. For example, users can ask ChatGPT to process data from a website,

spreadsheet, database, or text file, and it will try to provide them with accurate and useful results. It can perform various data processing tasks, such as cleaning, filtering, sorting, grouping, summarising, visualizing, or analysing data. For example, ChatGPT will try to clean data by eliminating duplicates or deviations, or analyse data by finding correlations and trends, and will provide accurate results.

Feedback and suggestions on data processing are important to improve the quality of your data. If users ask ChatGPT to review data processing or data quality, it will try to highlight errors or improvement areas and offer alternative or correction solutions. The use of ChatGPT in data interpretation is a possible application of analysing tools to provide insight and explanations to numerical or graphical data. ChatGPT can help researchers and students understand the importance and meaning of data, trends, patterns, and deviations. Therefore, ChatGPT reduces the time and effort required for data analysis and improves efficiency and productivity, but users should ensure that data is analysed accurately and effectively.

Prompt

Extract data about number of deaths by COVID 19 each European country and put it in a table.

Response

Here is a table showing the number of deaths by COVID-19 in each European country as of April 4th, 2023, based on data collected by Our World in Data:

Country	Total Deaths
Albania	2,377
Andorra	186
Austria	19,232
Belarus	23,824

Belgium	50,283
Bosnia and Herzegovina	11,402
Bulgaria	17,503
Croatia	10,532
Cyprus	1,001
Czech Republic	37,987
Denmark	3,090
Estonia	1,843
Finland	1,778
France	148,946
Germany	103,881
Greece	13,767
Hungary	17,348
Iceland	49
Ireland	6,732
Italy	147,745
Kosovo	2,465
Latvia	1,129
Liechtenstein	24
Lithuania	3,317
Luxembourg	1,415
Malta	342
Moldova	11,236
Monaco	38
Montenegro	1,643
Netherlands	22,066
North Macedonia	4,780
Norway	1,082
Poland	77,891
Portugal	18,822
Romania	29,741
Russia	932,826
San Marino	91
Serbia	10,466
Slovakia	11,829

Slovenia	4,057
Spain	110,729
Sweden	15,178
Switzerland	9,324
Ukraine	63,201
United Kingdom	146,210

Note that the data is subject to change as new information becomes available, and may differ from other sources due to differences in data collection and reporting methods.

Figure 14. ChatGPT response to: Extract data about number of deaths by COVID 19 each European country and put it in a table.

2.2.6. Title and keyword generation

Attractive titles and relative keywords for your manuscript are not essential to help readers understand what is in the manuscript, but to read and cite your manuscripts, leading to increase your citations. ChatGPT can generate attractive titles and keywords for any topic, domain, or field if there is enough data to learn the model. For example, ChatGPT can generate the title and keywords for research papers in psychology, sociology, computer science, life science or any other subject and strive to provide an accurate and attractive result (Figure 15).

For example, if authors ask ChatGPT to generate the title and keywords of a research paper to explore, compare, or evaluate, it will try to use a word that reflects the question and methodology of the study. It can also provide feedback and suggestions on their titles and keywords by trying to point out any errors or areas that need to be improved and propose alternatives or corrections.

Prompt

Generate the title and keywords for the following abstract:

New and improved agricultural technologies can transform lives, particularly the lives of smallholder farm households in Asia who are highly dependent on agriculture. However, there are large gender disparities in the adoption of such technologies. Many barriers exist in achieving gender equity in access to and adoption of agricultural technologies, from sociocultural norms and deeply rooted beliefs about gender roles to lack of agency and lack of resources to implement policies. Notwithstanding these barriers, the case for promoting gender-inclusive adoption of technology is strong. In this paper, we outline the rationale for improving women's adoption of agricultural technology and discuss the pitfalls of failing to include women in the technology-adoption agenda. We then explore the policy implications and suggest various strategies that promote gender-equitable outcomes and that can be used to mainstream gender in agricultural technology adoption efforts to convert policy statements to practical and effective actions [26].

Response

Title: Addressing Gender Disparities in Agricultural Technology Adoption in Asia: Policy Implications and Strategies

Keywords: agricultural technology, gender disparities, smallholder farmers, Asia, sociocultural norms, gender roles, agency, resources, policy implications, gender-equitable outcomes, mainstreaming gender, practical strategies, effective actions.

Figure 15. Example of title and keyword generation.

2.2.7. Reference management

As long as the model has enough data to learn, ChatGPT can generate references and citations for any subject, domain, or field. For example, ChatGPT can be prompted to generate references and citations to studies in psychology, sociology, computer science, nanotechnology, engineering, or other fields, and attempt to provide accurate and appropriate results (Figure

16). ChatGPT is trained on the use of random sources or formats to generate references and citations, so, ChatGPT considers the context and purpose of research papers when it is generating references. For example, if authors ask ChatGPT to generate references and citations for research papers following specific style guides, such as APA, MLA, or Chicago, it will try to use sources and formats that comply with the rules and customs of the style guides.

Bing chat displays some references associated with user's prompts at the end of each chat. Authors can use this feature to identify references related to specific topics that may be missed by traditional literature searches. Reading and including such references can enhance your understanding of the subject, but they must be carefully read and scanned to ensure they are correct and relevant.

As the field of academic writing evolves, ChatGPT is likely to become a more important tool for researchers, students, and educators. Its ability to generate natural language responses can be used to generate high-quality content for academic publications, provide academic writing guidelines, develop teaching materials, and improve communication and collaboration between academic authors and editors. However, ChatGPT has some shortcomings that limit its reliability and usefulness in academic writing, such as errors and non-sensitive answers, sensitive input syntax, excessive verbosity and excessive use. ChatGPT is likely to become a more important tool for researchers, students, and educators.

Prompt

Suggest 10 references about applications of artificial intelligence in drug discovery.

Response

Here are 10 references related to the applications of artificial intelligence in drug discovery:

- 1 .Ching T, Himmelstein DS, Beaulieu-Jones BK, et al. Opportunities and obstacles for deep learning in biology and medicine. *J R Soc Interface*. 2018;15(141):20170387. doi:10.1098/rsif.2017.0387
- 2 .Goh GB, Hodas NO, Vishnu A. Deep learning for computational chemistry. *J Comput Chem*. 2017;38(16):1291-1307. doi:10.1002/jcc.24764
- 3 .Gupta A. Artificial intelligence in drug discovery: present status and future prospects. *Expert Opin Drug Discov*. 2020;15(3):229-238. doi:10.1080/17460441.2020.1718405
- 4 .Hessler G, Zimmermann M, Matter H, Gubler HU. Automated ligand design: a new tool for drug discovery. *Drug Discov Today*. 2007;12(9-10):389-394. doi:10.1016/j.drudis.2007.03.012
- 5 .Imrie F, Bradley AR, van der Meer AD, et al. Artificial intelligence in drug discovery: recent advances and future prospects. *Expert Opin Drug Discov*. 2020;15(12):1421-1432. doi:10.1080/17460441.2020.1831971
- 6 .Kearnes S, McCloskey K, Berndl M, et al. Molecular graph convolutions: moving beyond fingerprints. *J Comput Aided Mol Des*. 2016;30(8):595-608. doi:10.1007/s10822-016-9938-8
- 7 .Keiser MJ, Roth BL, Armbruster BN, et al. Relating protein pharmacology by ligand chemistry. *Nat Biotechnol*. 2007;25(2):197-206. doi:10.1038/nbt1284
- 8 .Kipf TN, Welling M. Semi-supervised classification with graph convolutional networks. *arXiv*. 2016. arXiv:1609.02907
- 9 .LeCun Y, Bengio Y, Hinton G. Deep learning. *Nature*. 2015;521(7553):436-444. doi:10.1038/nature14539
10. Wallach I, Dzamba M, Heifets A. AtomNet: a deep convolutional neural network for bioactivity prediction in structure-based drug discovery. *arXiv*. 2015. arXiv:1510.02855

Figure 16. ChatGPT response to: Suggest 10 references about applications of artificial intelligence in drug discovery.

2.3. Editing and Proofreading

To create such ease of communication, authors and writers should always check their work carefully through the processes of editing and proofreading to guarantee that the produced text is clear, accurate, and engaging for the reader. The editing strategies focus on ensuring that your text is more readable by evaluating clarity, style, and quotations, while the editing strategies focus on eliminating grammar, punctuation, spelling, and formatting errors. ChatGPT plays a significant role in reducing the time for editing and proofreading manuscripts (Figure 17). By suggesting grammar, style, and structure improvements, ChatGPT can significantly reduce the time and effort needed for scientific writing (Figure 18),. Jillian et al. suggest that the use of ChatGPT can be effective in improving the title, abstract, and conclusion of your manuscript and adapting it to the parameters of the journal and better adapting its scope or audience [27].

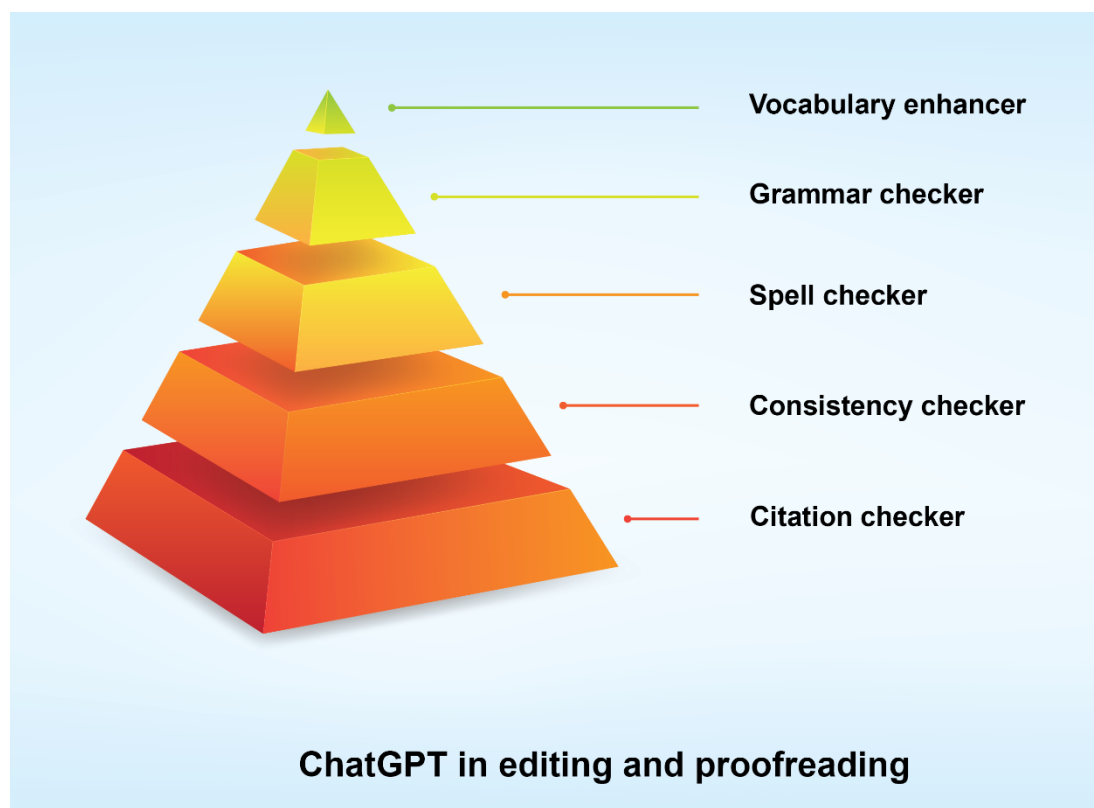


Figure 17. The applications of ChatGPT in editing and proofreading.

Prompt

Edite and proofread the following:

The Economic crisis is usually see as the situation into which the economy of a country experiences the sudden downturn in aggregate output or reality gross domestic product (GDP). The results of the economic crisis is a decline in real income per capital and an increaseing in unemployment and poverty.

Response

The economic crisis is usually seen as a situation in which the economy of a country experiences a sudden downturn in aggregate output or real gross domestic product (GDP). The result of an economic crisis is a decline in real income per capita and an increase in unemployment and poverty.

Figure 18. Example of editing and proofreading.

2.3.1. Vocabulary enhancer

Academic writing is a challenging task, especially in finding the right words to express the author's ideas clearly and effectively. One solution to this problem is to use ChatGPT as a vocabulary enhancer. ChatGPT, a large language model, has been trained on a large number of text data from different resources such as books, articles, and websites. Therefore, it has excellent English language knowledge and can help writers improve their vocabulary. To use ChatGPT as a vocabulary enhancement tool, authors can simply input a paragraph or phrase, and ChatGPT will provide synonyms and related words that authors can use in their writing. For example, if a user wants to find synonyms for the word "important," the user can input it into ChatGPT and it will generate a list of words such as significant, crucial, and essential.

Repeated use of the same word can make your writing monotonous and can also be a sign of bad writing skills. ChatGPT can find synonyms and related

words to change your language and make writing more interesting for reading. The use of ChatGPT may lead to avoid repeatedly using the same words in your writing. Another advantage of using ChatGPT as a vocabulary enhancement tool is to help writers find the right words to express their ideas clearly. Sometimes authors struggle to find the right word to express a particular idea, which can lead to confusion or ambiguity in their writing. ChatGPT searches for synonyms and related words and finds the perfect words that clearly express your ideas.

However, it should be noted that the use of ChatGPT as a vocabulary enhancement tool does not replace reading and learning vocabulary. ChatGPT can help students and writers find synonyms and related words, but does not teach them the context in which they should be used. Therefore, ChatGPT should not replace learning vocabulary but should serve as a tool to improve vocabulary.

Overall, using ChatGPT as a vocabulary improver can be an effective way to improve academic and scientific writing. It helps to find synonyms and related words, change language, and accurately express ideas. However, it is necessary to remember that ChatGPT is the only tool and should be used in conjunction with vocabulary learning through reading and studying.

2.3.2. Grammar checker

Good grammar is an essential part of effective writing. However, it can be difficult to maintain an appropriate grammar in a consistent way, especially in the creation of complex content. The authors can use ChatGPT as a grammar checker to solve this problem by analysing grammar errors in manuscripts or documents [23]. For example, if authors write an essay and need to ensure that the grammar is correct, the authors can enter their text in ChatGPT, and it will give them suggestions to improve the grammar.

Grammar errors are difficult to recognise, especially if users are not grammar experts. ChatGPT helps users identify grammar errors that they may have missed and offers suggestions to correct them. The use of ChatGPT as a grammar checker does not help to quickly identify and correct grammar errors, but it will improve the overall quality of your writing.

Written without grammar errors is easier to read and understand and can also make your work more impactful. Using ChatGPT to check your grammar, authors can ensure that their work is of the highest quality. However, it should be noted that the use of ChatGPT as a grammar test is not an alternative to learning grammar rules. ChatGPT can help users identify grammar errors, but it cannot teach grammar rules. Thus, it is important to use ChatGPT as a tool to improve grammar, not a replacement for grammar learning.

Overall, using ChatGPT as a grammar checker is an effective way to improve the quality of your writing. It can quickly identify and correct grammar errors and improve the overall quality of your writing. However, remember that ChatGPT is only tool, so they need to combine grammar rules to ensure the highest quality of your writing.

2.3.3. Spell checker

Spelling errors have a major impact on the quality of writing and can be difficult to understand. Although some spelling checker tools are often used to detect and correct spelling errors, they are not always accurate. But ChatGPT is accurate compared to most spelling checker tools. To use ChatGPT as a spelling checker, authors can input their text and ChatGPT will analyse it for spelling errors [28]. For example, if users want to make sure their email is written correctly, the user can enter their text into ChatGPT, and it will give his/her suggestions to improve their spelling.

Spelling errors are difficult to spot, especially if writers are not expert on spelling rules. The advantages of using ChatGPT as a spelling checker help writers to quickly identify and correct missed spelling errors and provide suggestions to correct them. ChatGPT checks spelling by ensuring that your work is of the highest quality, thereby improving the overall quality of writing and making your work more powerful. However, ChatGPT, which acts as a spelling checker, does not replace learning spelling rules. ChatGPT can help users identify spelling errors but cannot teach them the rules of spelling. Therefore, ChatGPT should be used as a tool for improving spelling accuracy rather than as a replacement for learning spelling rules.

In summary, using ChatGPT as a spelling checker can be a useful way to improve the accuracy and readability of your writing. It can quickly identify and correct spelling errors and improve the overall quality of your writing. However, it is important to remember that ChatGPT is a tool but must be combined with spelling rules to ensure the highest quality of your writing.

2.3.4. Consistency checker

Writing anything requires consistency in grammar, style, and tone, whether it is an essay, a report, a thesis, or a research paper. Inconsistent writing can make it difficult to read and understand your work and may have a negative impact on your credibility as a writer. A solution to this problem is to use ChatGPT as a consistent checker. As such, ChatGPT has a rich knowledge of English and can help writers improve the consistency of their writing. The use of ChatGPT as a coherent checker is relatively easy. All users need to do is enter the text and ChatGPT will analyse the consistency of grammar, style, and tone. For example, if authors are writing a review article or a report and want to ensure that the style and tone of their writing are consistent, the authors can input their text into ChatGPT and provide suggestions for improving consistency.

Inconsistencies are difficult to spot, especially if users have worked on a long project or manuscript. ChatGPT can help them identify inconsistencies that they may have missed and provide suggestions for correction. Other applications of ChatGPT as a coherence checker include the ability to quickly identify and correct errors in writing and improve the overall quality of writing. Consistent writing in terms of grammar, style, and tone makes you feel more comfortable reading and understanding, and your work becomes more impactful. By using ChatGPT to verify the consistency of your writing, authors can ensure that their work is of the highest quality. However, it is important to note that the use of ChatGPT as a consistent control is not a substitute for proofreading and editing. ChatGPT can help identify inconsistencies but cannot replace the human eye to identify errors and improve overall writing quality.

In summary, the use of ChatGPT as a consistent checker can be a useful way to improve your writing quality. It can quickly identify and correct inconsistencies and improve the overall consistency of grammar, style, and tone of writing. However, keep in mind that ChatGPT is only a tool and should be used in conjunction with editing and editing to ensure the highest quality of your work.

2.3.5. Citation checker

Proper citations are an important component of academic writing, as they help avoid plagiarism and provide credit to the original author. However, tracking all sources and ensuring that they are correctly quoted may be difficult if the authors did not use reference management software. To reduce mistakes in citation and references, it is recommended to use ChatGPT as a Citation Checker. It is relatively easy to use ChatGPT as a citation checker. A user can enter the text and source of his or her, and ChatGPT analyses it to check the accuracy of the citation. To ensure that the citation is accurate in the literature

or text, enter text and the used source in the literature in ChatGPT and get suggestions for improving the citation accuracy.

Citation errors are difficult to detect, especially if they are not expert on citation rules. ChatGPT as a citation checker can quickly identify and correct citation errors that may have been missed and provide suggestions to correct them. Creating accurate citations is more reliable and reliable, and it can also have a more influential impact on your work. Authors can verify the highest quality of their work by using ChatGPT to verify their citations.

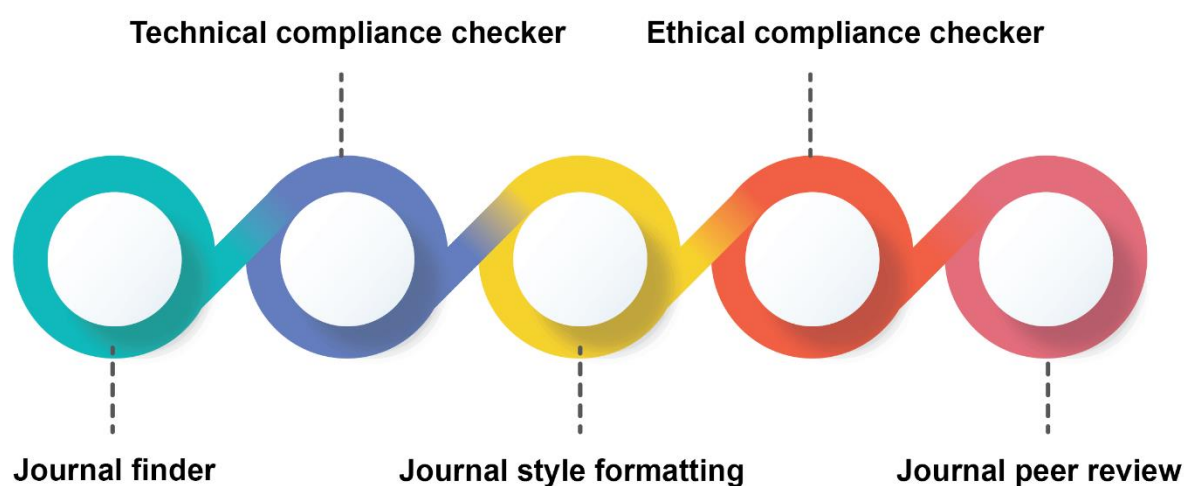
Application of ChatGPT as a citation checker does not include identifying citation errors but it provides feedback and suggestions on references and citations. For example, if authors ask ChatGPT to review the references and citations or check spelling or grammar, it will try to point out any error or improvement area and provide alternatives or corrections. These promising features help improve the overall quality of your writing. However, it is important to note that the use of ChatGPT as a citation checker is not a substitute for learning citation rules. ChatGPT helps users and authors identify citation errors, but it does not teach citation rules. Therefore, ChatGPT should be used as a tool to improve the accuracy of your citations, rather than replacing the learning of citation rules.

The use of ChatGPT as a reference checker is an effective way to improve your writing accuracy and credibility. It can help authors quickly identify and correct citation errors and improve the overall quality of their writing. However, it is important to remember that ChatGPT is a tool and must be used in conjunction with the learning of citation rules to ensure the highest quality of your writing.

Writers and authors can receive feedback and suggestions on their documents and literature using ChatGPT. It will check grammar, spelling, and punctuation in the document or literature, try to detect errors or areas that need to be improved, and propose alternatives or corrections. ChatGPT's functions can be particularly helpful for non-native speakers of English who may struggle with writing academic articles. However, please carefully review the content generated by ChatGPT and make any necessary changes to ensure accuracy and clarity [29].

2.4. Academic Publishing

Academic publishing is a subfield of publishing that distributes academic research. Most academic works are published in academic journals, books or dissertations. Academic publishing plays a central role in supporting researchers and advancing scientific progress. ChatGPT has numerous applications in scientific and academic publishing from journal finder to technical compliance checker (Figure 19).



ChatGPT in academic and scientific publishing

Figure 19: ChatGPT's functions in academic and scientific publishing.

2.4.1. Journal finder

Choosing the right journal to submit your research paper is important for the success of your work. However, there are so many journals, and it can be difficult to determine which one is best suited for your research topics and methods. A possible use of ChatGPT in academic publishing is to use it as a recommendation tool to suggest appropriate journals for your paper based on your topic, keywords, abstracts or references [30]. ChatGPT helps authors to find journals corresponding to the scope, quality and impact of their research. ChatGPT can provide information about the journal's objectives, scope, editorial board, submission guidelines, acceptance rates, or impact factors.

The use of ChatGPT as a comparison tool helps authors in comparing different journals according to different criteria. ChatGPT can help authors evaluate the advantages and disadvantages of each journal, such as its reputation, visibility, speed, or cost. ChatGPT can also classify journals based on your preferences or priority. ChatGPT can also provide information on the focus and scope of the journal, the submission process, and the acceptance rate. ChatGPT's advantages in the journal selection process save time and effort. Researching journals can be a time-consuming task and it can be difficult to determine which journals are suitable for your research. ChatGPT can quickly provide a list of potential journals so that researchers can focus on writing their research papers.

Different journals have different audiences, and it is important to choose a journal that is appropriate for your research topic and methodology. ChatGPT helps authors find the appropriate journal for their research and ensures that their work is read by the right audience. However, it is important to note that the use of ChatGPT in the journal selection process is not a substitute for research. ChatGPT can provide a list of potential journals, but it cannot replace

the process of reading journal guidelines, evaluating journals' quality, and determining whether journals are suitable for your research.

In general, ChatGPT can be an effective way to find the right journal for your research (Figure 20). It can save time and effort and help authors find the right audience for their manuscripts. However, it is important to remember that ChatGPT is a tool and should be used together with your experience in research and publishing to choose the best journal for your research paper.

Prompt

Give a list of journals for this abstract and recommend the best one:

Breast cancer is a significant health concern worldwide, and there is a constant need for the development of new and effective treatments. Organic compounds have received considerable attention as potential sources of anti-cancer agents due to their diverse chemical structures and biological activities. In this paper, we focus on the synthesis of derivatives from organic compounds for breast cancer treatment. We review various synthetic strategies and methods for the preparation of organic derivatives with potential anti-cancer activity against breast cancer. These include modifications to the structure of natural compounds, as well as the development of new synthetic compounds with optimized pharmacological properties. We also discuss the mechanisms of action of these compounds and their potential for clinical application. Finally, we highlight the challenges and future directions for the development of organic derivatives as anti-cancer agents for breast cancer. This review provides valuable insights into the synthesis and development of organic derivatives for breast cancer treatment, which could contribute to the development of novel and effective anti-cancer therapies.

Response

List of journals for this abstract:

- Journal of Medicinal Chemistry
- Cancer Research
- European Journal of Medicinal Chemistry
- Anti-Cancer Agents in Medicinal Chemistry

- Bioorganic & Medicinal Chemistry Letters
- Breast Cancer Research and Treatment

The best journal for this abstract would be "Breast Cancer Research and Treatment" as it is a highly respected and specialized journal in the field of breast cancer research and treatment.

Figure 20. Example of journal recommendations for an abstract.

2.4.2. Journal style formatting

It is difficult for early-career researchers and students unfamiliar with journal style guidelines to create research papers to meet the requirements of specific journals. ChatGPT is a relatively simple formatting tool, and authors meet the journal style requirements for their manuscripts. Simply enter your text, ChatGPT analyses it, and provides suggestions to format your research paper according to the journal style guidelines. For example, if an author will send a research paper to a journal that requires APA formatting, by inputting the text to ChatGPT, and it will provide suggestions to format the paper according to APA guidelines.

Creating a research paper requires time and it can be difficult to determine the appropriate formatting requirements for a specific journal. ChatGPT offers recommendations to quickly format manuscripts and enables writers to focus on their research. Most journals have different formatting requirements, so it is important to ensure that your paper meets these requirements in order to avoid rejection. One advantage of using ChatGPT as a journal-style formatting tool is that it helps avoid common formatting errors, saving time and effort.

Although ChatGPT will try to ensure that your documents comply with the journal's guidelines, it is important to note that the use of ChatGPT as a journal style formatting tool does not replace understanding journal style guidelines.

ChatGPT can provide suggestions for formatting your manuscripts but cannot replace the process of reading and understanding journal guidelines.

Finally, using ChatGPT as a journal-style formatting tool is an effective way to format research papers to meet specific journal requirements. It can save time and effort and help avoid common format errors. However, it is important to remember that ChatGPT is the only instrument and should be used in conjunction with understanding and complying with the style guidelines of the journal to ensure that your research papers are properly formatted.

2.4.3. Journal peer review process

Peer reviews are an essential part of the academic publishing process and play an important role in ensuring the quality of research. However, responding to comments is a difficult task, especially for researchers who are not familiar with peer review procedures. Another possible application of ChatGPT in peer review processes and to respond to the reviewer is to use it as a revision tool to address comments and questions from the reviewer on your own document [23, 31].

ChatGPT assists co-authors of the literature in writing clear and concise answers that explain how they have reexamined their articles, why they have accepted or rejected the comments from the reviewers, and what they have learnt from the feedback. Authors can also ask ChatGPT for evidence, citations, or graphics to prove their revision.

Responding to the comment of the reviewer can be a time-consuming task, and it may be difficult to determine an appropriate response. ChatGPT can provide suggestions to quickly respond to comments and help authors focus on improving research. ChatGPT is a relatively simple way of helping peer review and response processes by analysing the reviewer's comments and

manuscript to give suggestions and respond effectively to the comments. For example, if the reviewer comments on a particular methodology used in the research, it can be promoted to ChatGPT and will provide suggestions for answering the comments clearly and concisely.

Effectively responding to feedback from reviewers is essential to the success of your research and can also improve the overall quality of your research. ChatGPT can also be used to support peer evaluation and response processes to improve the quality of your responses. ChatGPT can respond in a clear and concise manner to the comments of the reviewer and ensure that your answers are of the highest quality. However, it should be noted that using ChatGPT to assist in peer-to-peer review and response processes does not replace understanding critic comments. ChatGPT can provide suggestions to answer comments, but it cannot replace the process of understanding comments and making appropriate changes to your research.

Finally, using ChatGPT to assist peer review and response processes can be an effective way to respond clearly and concisely to the comments of reviewers. It saves time and effort and improves the quality of your response. However, remember that ChatGPT is the only tool and that it must be used to understand and respond to the reviewer's comments to ensure the highest quality of your research.

2.4.4. Ethical compliance checker

Ethics compliance is a key aspect of research and must ensure that research complies with the ethical standards of its field. However, it can be difficult to determine whether your research meets the ethical standards, especially for researchers who are not familiar with the requirements. To ensure that your research meets ethical standards, it is recommended to use ChatGPT as an ethical compliance checker tool. For example, if researchers or academic staff

are conducting human research, researchers can enter a research paper into ChatGPT and it will provide a suggestion to ensure that their research meets human ethical standards. Whether your research meets ethical standards can be a time-consuming task and difficult to determine the appropriate ethical standards for your research. ChatGPT can provide suggestions to ensure that your research quickly meets ethical standards to concentrate on your research.

Ethical violations can have serious consequences for researchers, including loss of funds and reputation damage. ChatGPT can help identify potential ethical violations and provide suggestions to ensure that your research complies with ethical standards and avoids potential ethical violations. However, it should be noted that the use of ChatGPT as a check of ethical compliance does not replace understanding ethical standards. ChatGPT can provide suggestions to ensure that your research meets ethical standards, but cannot replace the process of understanding and ensuring that your research meets ethical standards.

In conclusion, ChatGPT can be used as an ethical compliance checker to ensure that your research meets ethical standards. It saves time and effort and helps prevent possible ethical violations. However, it is important to remember that ChatGPT is the only tool that must be used in combination with understanding and ensuring that research meets ethical standards to ensure the highest quality of research.

2.4.5. Technical compliance checker

Checking if the research document meets technical standards can be a time-consuming task and it can be challenging to determine the appropriate technical standards for research. Ensure that research papers comply with technical standards is crucial to success and it is difficult to determine whether they meet those standards. One solution is to use ChatGPT as a technical

compliance checker. For example, if authors send a research paper to a conference that requires specific formats or structures, they can enter their paper into ChatGPT and it will provide suggestions to ensure that the paper meets those requirements and technical standards.

Technical errors can have serious consequences for researchers, including rejection or loss of credibility. ChatGPT helps identify potential technical errors and provides suggestions to ensure that research documents meet technical standards to avoid potential technical errors. However, it should be noted that the use of ChatGPT as a technical compliance checker does not replace understanding technical standards. ChatGPT can provide recommendations to ensure that your research paper meets technical standards, but it cannot replace the process of understanding and ensuring that your research paper meets technical standards.

In summary, using ChatGPT as a technical compliance checker can be an effective way to ensure that your research documents meet technical standards. It can save time and effort and help authors avoid potential technical errors. However, ChatGPT is only a tool and should be used in conjunction with understanding and ensuring that the papers meet technical standards to ensure the highest quality of the research.

Finally, ChatGPT has the potential to streamline academic and scientific publishing processes and improve the efficiency and accuracy of academic publishing. However, it is essential to recognize the limitations and ethical concerns associated with the use of ChatGPT in academic publishing. We recommend that researchers and publishers use ChatGPT as a tool rather than a substitute for critical thinking and scientific judgement. In addition, more research is needed to address potential biases and limitations of ChatGPT in academic and scientific publishing.

2.5. Conclusion

In conclusion, ChatGPT's applications in academia and scientific research are extensive and constantly evolving. ChatGPT's use in academic and research fields could revolutionize the scientific writing and publishing process. ChatGPT is based on the two advanced large-scale language models (LLMs) GPT-3.5 and GPT-4, and is widely used in academic writing, including hypothesis generation, literature review, meta-analysis, summarization, idea extraction, research design, academic and scientific writing, language translation, informal to academic text converter, paraphrasing, data interpretation, title and keyword generation, reference management, editing and proofreading. ChatGPT has also numerous applications in scientific and academic publishing such as journal finder, journal style formatting, journal peer review process, ethical compliance checker and technical compliance checker.

However, it is essential to recognize the limitations and ethical considerations associated with the use of ChatGPT in academic publications, including the possibility of bias in generated texts and overreliance on models. In order to effectively integrate ChatGPT into the academic publishing process, researchers and publishers must use ChatGPT as a tool, not a replacement for critical thinking and scientific judgment. Furthermore, further research is required to address the potential prejudices and limitations of ChatGPT in academic publishing. In general, ChatGPT is used to improve the efficiency and accuracy of academic or scientific writing and publication. ChatGPT can be a valuable tool for the scientific community by taking appropriate advantage of limitations and ethical considerations.

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- Ferct, #1 AI-powered goal achievement network, brings products, services, opportunities, training systems, resources and people, all in one place to save money and time, accomplish your tasks and reach your goals more easily and effectively. For more information: www.ferct.com

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