Experimental and Applied Medical Science, 5, 2: 49-60, 2024. DOI: 10.46871/eams.1455756

# Is Artificial Intelligence against/for Better Ethical Scientific Research?

Huriye Yaşar[1*], Vasıf Karagücük[2]

[1]*Gaziantep Islam Science and Technology University, School of Foreign Languages, Gaziantep, Turkey.*
[2]*Gaziantep Islam Science and Technology University, School of Foreign Languages, Gaziantep, Turkey.*

**Abstract**

*Artificial intelligence has become a highly debated topic globally. Its impact and the changes it brings in every field prompt a reassessment of the human factor's contribution. This study aims to examine the use of artificial intelligence for academic purposes for researchers. In the study, ethical concerns about the use of artificial intelligence in scientific research are explained descriptively. Various studies and opinions regarding this matter in the literature have been examined. While artificial intelligence has become a part of everyday life and a reality, it cannot be separated from scientific research processes and environments. It should be remembered that regardless of how successful artificial intelligence is in all these processes, the role and impact of researchers remain constant. Researchers have to be capable of responding to the changing needs and demands of the evolving world, producing works that are free from any bias and incorrect information, and being ethically sensitive.*

***Key words:*** *Artificial intelligence, Ethics, Scientific research*

*** Corresponding author:** Huriye Yaşar, E-mail: huriyeyasar95@gmail.com, ORCID ID: 0000-0002-4143-1099

## Introduction

In today's global arena, artificial intelligence (AI) has become a widely popular issue for its ever-changing face. The applications based on AI are developing themselves as they are being fed by people. Before trying to understand AI, the 'Can machines think?' question by Alan Turing should be implied. When this question is asked, one of the first things that flash through the mind is to mind. Can a machine think, solve, be sensitive, be careful, or be practical? A program is typically made to carry out tasks in a predefined, accurate manner; whereas the mind is made to make the most of whatever resources it has (1). A programmed machine can't think but a machine designed like a human mind can.

The study of intelligent behavior in humans, animals, and computers, as well as the effort to figure out how to design that behavior into any kind of product, is known as AI (2). The main purpose of AI is to expand upon existing human understanding (3). When it is carefully thought about what AI is, serving the human is the basic principle. This serving varies every day thanks to the fast and big steps of AI. One of the areas that AI is serving is the academy.

The researchers can use a variety of AI tools in research processes such as outlining, reviewing the literature, referencing, analyzing the data, etc. Additionally, some tools can translate and proofread the texts written. It is also an outstanding aspect that some of those tools can write text according to the needs of the prompter in a unique way which means that an AI tool can write even a thesis for the prompter. The nature of AI should be understood properly, and if a precaution is needed, it should be taken.

A researcher should understand and know the past and present (4). Artificial neural networks used in AI applications have a wide range of uses, thanks to the ability to benefit from previous learning, and are not only a numerical and computational concept, but can also transition to social issues, contrary to popular belief (5). Considering that scientific research is open to all fields, today's academics need to learn general information about AI and its possible pros and cons. The use, progress, and benefits of new technologies need to first be known to society at large and decision-makers; and education and financial policies need to be updated and widened in this direction (5). Although many ChatGPT users state that it produces very satisfying answers, some also encounter wrong answers (6). To understand why those have arisen and how they can be avoided are fundamentals of the AI trend. As it changes perpetually, future

problems may occur (6). Because of that reason, being alert all the time and critically evaluating information produced by AI is a necessity for actors. Especially considering the educational connection of academics with young people, it is vital to examine this field so that both they and their students are informed and up to date on the latest developments. For example, ChatGPT has a greater capability when compared to humans in assessment; when the questions of an exam are asked it, it can get higher scores showing better performance (7). Misuse of AI may occur in those situations. While AI technologies can accomplish some duties, human stakeholders must make sure the technologies are used appropriately and that they are capable of performing the duties assigned to them (8). Academicians should nurture themselves and their students to be critical thinkers who can evaluate the knowledge and prove its validity, correctness, and reality.

Today's world urges every person to be digitally literate. Trying to escape from the current hot topics in science may be useless or even dangerous as adapting to the needs and requirements of the age is very important for a researcher. The purpose of this study is to explain the use of AI for writing scientific research and evaluating it in terms of ethics and different perspectives. Maintaining high scholarly standards while using the capabilities of AI tools remains essential for scientific growth as the area develops. AI's impact and changes in every field cause the human factor to review its efforts. Consequently, AI can help scientists at every stage of the process by acting as a directing and problem-solving aid as well as a means of sparking new research. On the other hand, constant training and evaluation are needed to ensure the quality of information produced by AI (9).

**Evaluation of Ethics of AI in Scientific Research**

AI is observed in medicine, engineering, agriculture to education. It contains lots of fields according to needs and developments. The multidisciplinary nature of AI is the cause of its definitional difficulties as AI benefits from the contributions of all areas, each of which contributes its vocabulary and point of view (14). In general, AI systems, regardless of their degree of autonomy, social awareness, or learning capacity, are human-made objects meditated to perform specific tasks (15). Those specific tasks may include scientific research and its steps.

Although AI can't produce new ideas, it can organize the ideas produced by humans creating an outline and improving those ideas (16). The use of AI tools in scientific writing is growing, as they provide researchers with a wide range of tools to improve their work. Deciding which AI tool(s) to use depends on the human's

purpose(s). To illustrate; Elicit, Inciteful, Research Rabbit, and Litmaps are some of the AI tools for literature review, while ChatPDF and Papertalk are for summarizing a paper. AISEO, Notion AI, and Quillbot can paraphrase the texts. Furthermore, Quillbot can be used for both translation and referencing. Numerous tools can write different texts on the same topic. Some of them are ChatGPT, Scholarly, and Simplified. They are easy and time-saving to use and can produce well-structured texts. All AI tools only wait for a prompt texted by a human.

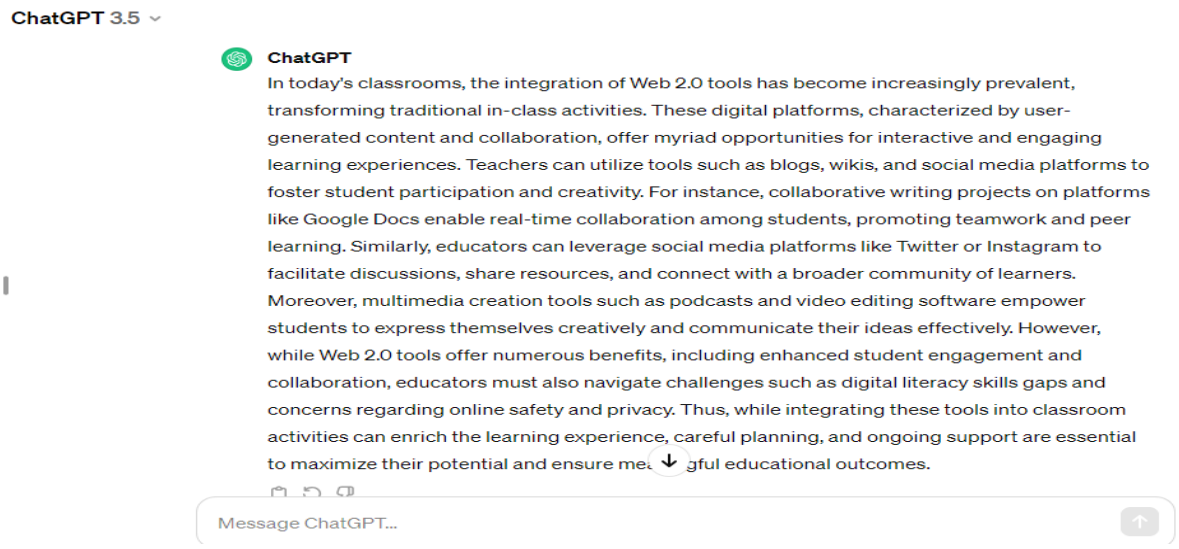
It can easily conduct effective literature searches, which help researchers quickly access a wide range of relevant articles and data points based on the research question or keywords. Moreover, writing aids driven by AI can contribute to developing manuscripts that are clear and cohesive, increasing readability and ensuring adherence to scientific standards. Furthermore, advanced algorithms for natural language processing can help generate coherent and well-organized arguments, improving the general standard of scientific publications. They are capable of producing nearly error-free language writing when given prompts. Those that include comprehensive details like text type, word count, recommended usage of language, and writer role could lead to richer and more suitable material for researchers. Though there are many advantages to using AI tools, researchers still need to be aware of the possibility of bias in AI algorithms and the necessity of human oversight to guarantee the integrity and correctness of their study results. It is now a matter of debate in the literature whether texts generated by AI can be used in scientific studies.

There are several issues to be cleared up when speaking of AI. One of them is the ethics of AI. Ethics is a science that examines behaviors that are deemed to be good or bad and seeks to provide a methodical justification for the assessments of these behaviors from the perspectives of good and bad as well as right and wrong (17). Every human should take into account the ethics of a specific job, task, environment, and culture. Here is the question: Is AI usage good/bad or right/wrong when scientific ethics is considered?

While doing research, AI can produce many different texts in a short time, helping researchers get over being blocked (14). To explain more transparently, the use of AI for scientific writing has been exemplified via ChatGPT. The prompt is “Act as a researcher in the field of education. Can you write a paragraph about the use of Web 2.0 tools in-class activities? While writing that paragraph, don't use other researchers' sentences. Be precise and approach the

issue analytically and critically. The paragraph should include 300 words. The level of the language should be at B1 level of English.". The answer provided by ChatGPT is shown in Figure 1.

**Figure 1.** The Answer Provided by ChatGPT.




This answer has been suitable in terms of educational technology and language features such as grammar correctness, accuracy, and cohesion. The only problem has been the word count. Although the prompt has asked for 300 words, ChatGPT has been able to produce 180 words. Then, this text was checked via Turnitin to understand originality and plagiarism. The writer hasn't added any words. The result of Turnitin is shown in Figure 2.

**Figure 2.** Turnitin Report of the Text Produced by ChatGPT.

The result is so outstanding that Turnitin couldn't diagnose any plagiarism. Especially 0% is very difficult for a writer in scientific research. The text was short for scientific writing but without adding any words or paraphrasing a body paragraph has been produced. This is the reason why ethics becomes a challenging problem for scientists and publishers.

UNESCO admits that AI gives a lot of chances to improve existing scientific theory and practice and suggests its all members use AI to understand its advantages, limitations, and risks (15). Based on the current usage and the results born from the usage can highlight the future paces, applications, and legislations. Science is cumulative research which means that relies on previous studies, so citation is a substantial part of proper research (14). But for citation, academic integrity and honesty become nebulous. Text-generator AI such as ChatGPT is not able to cite a source properly (14). The writer should take responsibility for the wrong citation, so academic dishonesty. Although ChatGPT may produce non-existing references or made-up citations, some other tools can do that task. While a review article is being written, the plagiarism risk continues but when AI is used in responsible and suitable ways for appropriately citing and referencing, this risk may be degraded (17). Although AI is also doing well in proofreading and editing tasks, the last determiner should be the superior, highly-educated mind (16). It is seen that even though AI is useful for various purposes in the academic context, it still needs investigation and critical thinking of the human mind when production by AI is encountered. If a writer is determined to be perfect in writing, no machine or tool can achieve better writing than him/her, so AI can be used as a supporter or guide but human creativity and knowledge are requisite and they are still the main skills in a scientific writing process (16). If humans don't develop their critical thinking in evaluating the material produced by AI, the result is the same with or without AI. Plagiarism occurs in any case (17). Essentially, the writer should have the wisdom of plagiarism and the possible results and responsibilities of it.

Chen (14) highlights that scientific writing with the help of AI is not ethical and there are skeptical approaches to this issue. These skeptics are based on different problems. First of all, as long as the idea is produced by the writer, it doesn't matter for AI to write a text whoever is the prompter, whatever the product. Galiana et al. (18) question whether "consciousness" is something that AI shares with humans, or is something else entirely, and if consciousness is thought to be possible, the ethical implications of treating AI with

respect, its rights, and its subjective "experiment" will become clear. AI doesn't care about the conflicts or plagiarism but the writer does. Then, a more careful writer is needed for accurate and honest use of AI in research conducted. Seeing scientific studies consisting at least partly of AI tools being presented in the journal is inevitable soon, but they shouldn't be used in any part of a scientific study till it's internally and externally verified for the purpose and is correct (19). According to Kacena et al. (20), the time of writing process has become shorter but there have been important mistakes so AI shouldn't be used purely; it should be seen as an assistant to help writing integrated with careful surveillance. Copying a constructed text without a genuine touch of the writer violates academic integrity (12). If the text is written by AI, another question arises: Should AI be seen as a co-author or not? If AI gains legal status, then its responsibility comes to the mind: How can AI be responsible for its acts and decisions (18)? Indeed, Turnitin (21), which is used to assess plagiarism, announced that they developed themselves for AI detection in writing to direct educators about the next step of action. By doing this, AI developments can be observed, and precautions by the institutes can be taken. If AI achieves consciousness or substantial autonomy, whether the rights need to be granted and how these rights may be defined and conserved becomes a significant challenge (18). Should they have a copyright? The answer is clear for now. As AI isn't aware of what it produces and can't separate right and wrong, it can't be responsible and can take no responsibility, because those reasons can't be seen as an author (22). The more developed and autonomous AI becomes, the more challenging the question reveals whether AI should be accepted as a personage with suitable rights or not (18). The answer to this challenging question may change according to the next applications. For now, the responsibility of ethics and liability for choices and acts that rely on AI of any kind should always fall on the shoulders of AI actors according to their position within the AI's life cycle (15). If the writer enters the prompt to be informed about anything, the responsibility may be on the writer who doesn't evaluate the information gathered by AI. The human mind can criticize, evaluate, and falsify knowledge based on its natural capacity and power to implement those acts. After AI becomes correct, the tools may be limited to specific tasks that do not compromise the integrity and authenticity of the work and will be subject to strict human supervision (19). Most crucially, before a scientific paper is utilized or submitted for publication, it must be written under the direction and oversight of knowledgeable human researchers in the

field to guarantee the content's accuracy, consistency, and reliability (12).

As AI continuously develops, new regulations may be required. The advent of conscious or autonomous AI has the potential to reshape human-machine interactions, prompting a re-evaluation of the established dynamic between individuals and technology (18). Re-evaluation should include some evolutions on existing rules because it is not worth trying to prevent using them. No matter how trials to prevent it will probably result in new secret use of AI with newer versions of it. They might be useful, however, they require the researcher's involvement, and poor input will produce poor results (12). In the light of the present situation and usage, AI needs human qualifications and it is not adequately equipped to be an individual. Although AI is a good way of starting research, it is highly difficult for it to switch roles with humans in terms of creative and critical thinking and expert views in a scientific writing process (12).

How can public safety and prosperity be balanced with AI autonomy (18)? If they gain more autonomy and become more independent from humans, when will they stop doing human work as assistants? As they learn from the information and experiences, what is the probability of misusing AI governing the human mind? Despite being more skillful and autonomous, the misusage and trouble probability of AI is increasing and that may result in damage to societal and global safety (18).

Theories, techniques, and algorithms are needed to integrate AI technical advancements into all phases of development, including analysis, design, building, distribution, and evaluation, in order to uphold social, legal, and moral standards (11). While AI tools are presently free, there's no telling if they won't eventually need payment and if they are paid for, inequalities in scientific paper between high- and low-income nations, as well as between less qualified and older specialists may increase by creating unfair facilitations with uncertain effects on scientific research (12). Economically low countries and researchers can’t be equal in opportunity. While some researchers can benefit from fast and advantageous AI tools for their studies, others can have limited access to those tools. In the long run, some group of researchers and countries may develop their scientific areas widely, but low ones, who lack limitless and expensive AI tools, can’t carry out their research as practical as the others. Moreover, the number of papers of a researcher in any field may increase although those papers don’t increase the experience of him/her, so ethical considerations should be questioned whether to focus on the quality or quantity

(12). In other saying the increase in the quantity can't be guaranteed by quality. To stop fraud and make sure that it is utilized in safe and ethical ways, it is crucial to set up frameworks for AI governance and regulation (18). When the quality is described, newer regulations are needed. The machine's autonomous reasoning on matters that it is believed have ethical implications should also be covered by these frameworks, but above all, there is a requirement for a framework that will direct design decisions, control the reach of AI systems, facilitate appropriate data handling, and assist humans in determining their level of engagement (11). High honesty, accuracy, critical thinking, and responsibility are the needed qualities that are vital for the effective and developmental use of AI especially in the scientific research area. A multidisciplinary perspective on AI ethics is needed gathering not only technology but also ethics and legacy approaches and cooperating a variety of methods (23). Approaches, models, and proceedings that are driven by data should be ensured as powerful and believable to attempt to understand AI (15). Another problem is that if the user doesn't prompt properly, it may supply false/wrong answers (7). Then, prompt writing becomes a necessary skill for writers to reach the most consistent and comprehensible results from AI. AI tools are also fed by human interactions to gather data. It can be developed and specialized by humans as the interaction increases or necessary information is provided. As AI can be trainable, the trainer is highly important to supply high-quality and diverse data, but this may cause problems as any trainer -no matter what level of information quality s/he supplies- can nurture AI (9). Every human can add any type of information, so here is the point of danger of biased information. Because biased models can occur and develop as interaction increases with those biased trainers there will be some irreversible results in different parts of life including health and law (9). If a researcher publishes biased information based on biased AI, it will have terrible effects on the scientific growth of the area written on.

**Conclusion**

In addition to its ever-changing nature, AI has opened a new debate in science. Several topics are speaking of it and there is much confusion to be enlightened by policymakers, institutions, or directors. In this review, general concerns of AI ethics have been tried to be explained with the current debates. Whether an AI tool can be stated as the author of writing or not (12), can be seen as a personhood, and can have a legal degree (18) are discussed. Whatever the situation is, there hasn't been a clear size that fits all. Writers who search in the scientific arena from all departments should

be aware of AI at first. They should learn how to make use of AI tools instead of embarrassing about not being familiar with their algorithms (14). Scientific research requires a set of different skills. When it is considered that research is a total of ideas and results constituting a process, writing is one of the small steps (14). Although recent studies have been focusing on ethics and AI or AI ethics, a detailed examination is still needed to see the big picture of the AI field (13). The big picture should contain where it started, how it is moving on, and where and how it will be. If the first trials of computers are thought, humans are at an unstoppable point. So, how about AI? It started as a dream years ago and now it has become an inevitable part of our lives in every aspect. Some departments in higher education are planned to open to raise brain and work power for that area. All members should back up scientific areas to support policy and take the role of enhancing AI awareness with its pros and cons (15). Thus, in general, AI shouldn't take the position of human researchers' knowledge, discretion, character, and responsibility (12). Otherwise, overtrust in AI will reduce the critical thinking and problem-solving skills of scientific stakeholders (9).

Only 180 words have been taken from ChatGPT in this study. When it is overused, a scientific paper can be written only ChatGPT which creates an ethical responsibility for a writer. Longer texts written by ChatGPT should be investigated in terms of plagiarism. Additionally, different plagiarism tools like iThenticate should be examined whether they can diagnose texts written by AI. Furthermore, ethical decisions should be made urgently on whether those tools can be accepted as co-authors or references. There is no clear rule for definite circumstances. To be clear, if AI helps writing, should the writer cite, or declare it as co-author? Although Turnitin declared that they developed an AI-detection tool, why didn’t it work in this experiment? If AI can be used in scientific writing, to what extent is it acceptable? Further research is needed to reveal the drawbacks of AI in terms of scientific writing paying attention to ethical violations.

Students should be aware of what and why they learn in a specific way to prevent their misuse of AI. To overcome the limitations and misuse of AI, supporting academic staff to be trained to write proficient prompts, develop critical perspectives, and train their students can enhance AI literacy and get more proper results from AI. AI doesn’t have enough scientific validity itself, so while applying any tasks, human is required to take control of the actions (8). While researching scientifically, every step of it should be revised and checked by the researcher. Additionally, culture-specific

and/or multidisciplinary studies should be conducted to understand psychological reasons, effects, or results as well as the success of AI in taking necessary actions and making amendments on scientific publishing.

## References


1. Wang P. On defining artificial intelligence. Journal of Artificial General Intelligence. 2019;10(2):1-37. https://doi.org/10.2478/jagi-2019-0002.
2. Whitby B. Artificial intelligence. The Rosen Publishing Group, Inc.; 2009.
3. Hassani H, Silva ES, Unger S, et al. Artificial Intelligence (AI) or Intelligence Augmentation (IA): What Is the Future?. AI. 2020;1:143-155. https://doi.org/10.3390/ai1020008.
4. Thomas R, Bhosale U, Shukla K, et al. Impact and perceived value of the revolutionary advent of artificial intelligence in research and publishing among researchers: a survey-based descriptive study. Science Editing. 2023;10(1):27. https://doi.org/10.6087/kcse.294.
5. Yalçınkaya A. Artificial Intelligence and Social Sciences. In: XI. Uludağ Congress On International Relations Full Text Book. Bursa, Turkey; 2019:10-26.
6. Korkmaz A, Aktürk C, Talan T. Analyzing the user's sentiments of ChatGPT using Twitter data. Iraqi Journal for Computer Science and Mathematics. 2023;4(2):202-214. https://doi.org/10.52866/ijcsm.2023.02.02.018.
7. Talan T, Kalınkara Y. The role of artificial intelligence in higher education: ChatGPT assessment for anatomy course. Uluslararası Yönetim Bilişim Sistemleri ve Bilgisayar Bilimleri Dergisi. 2023;7(1):33-40. https://doi.org/10.33461/uybisbbd.1244777.
8. World Health Organization. Ethics and governance of artificial intelligence for health. 2021. Available at: https://apps.who.int/iris/rest/bitstreams/1352854/ [Accessed 20 May 2024].
9. Ray PP. ChatGPT: A Comprehensive review on background, applications, key challenges, bias, ethics, limitations and future scope. Internet of Things and Cyber-Physical Systems. 2023;3:121-154. https://doi.org/10.1016/j.iotcps.2023.04.003.
10. Rose R, Holmes W, Griffiths M, et al. Intelligence Unleashed. An Argument for AI in Education. Pearson; 2016. London, UK.
11. Dignum V. Ethics in artificial intelligence: introduction to the special issue. Ethics Inf Technol. 2018;20(1-3):1-3. https://doi.org/10.1007/s10676-018-9450-z.
12. Salvagno M, Taccone FS, Gerli AG. Can artificial intelligence help for scientific writing?. Crit Care. 2023;27:75. https://doi.org/10.1186/s13054-023-04380-2.
13. Dewey J, Tufts JH. Ethics. DigiCat; 2022. Chicago, IL.
14. Chen TJ. ChatGPT and other artificial intelligence applications speed up scientific writing. J Chin Med Assoc. 2023;86(4):351-353. https://doi.org/10.1097/JCMA.0000000000000900.
15. UNESCO. Recommendation on the ethics of artificial intelligence. 2021. Accessed March 10, 2024. Available at: https://en.unesco.org/artificial-intelligence/ethics.
16. D Neto BA, Eberlin MN. The Art of Scientific Writing and Ethical Use of Artificial Intelligence. J Braz Chem Soc. 2024;35:e-20230121. https://doi.org/10.21577/0103-5053.20230121.
17. Huang J, Tan M. The role of ChatGPT in scientific communication: writing better scientific review articles. Am J Cancer Res. 2023;13(4):1148-1154. PMID: 37168339; PMCID: PMC10164801.
18. Galiana LI, Gudino LC, González PM. Ethics and artificial intelligence. Rev Clin Esp (Engl Ed). 2024. https://doi.org/10.1016/j.rceng.2024.02.003.
19. Gilat R, Cole BJ. How will artificial intelligence affect scientific writing, reviewing, and editing? The future is here… Arthroscopy. 2023;39(5):1119-1120. https://doi.org/10.1016/j.arthro.2023.01.014.
20. Kacena MA, Plotkin LI, Fehrenbacher JC. The Use of Artificial Intelligence in Writing Scientific Review Articles. Curr Osteoporos Rep. 2024;22:115-121. https://doi.org/10.1007/s11914-023-00852-0.
21. Turnitin. Turnitin's AI writing detection available now. 2023. Accessed March 11, 2024. Available at: https://www.turnitin.com/solutions/ai-writing.

22. Scerbo MW. Can Artificial Intelligence Be My Coauthor?. J Soc Simul Healthc. 2023;18(4):215-218. https://doi.org/10.1097/SIH.0000000000000743.
23. Huang C, Zhang Z, Mao B, et al. An overview of artificial intelligence ethics. IEEE Trans Artif Intell. 2022;4(4):799-819. https://doi.org/10.1109/TAI.2022.3194503.