



Artificial Intelligence and Chat Bots in Academic Research

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Article Info	Abstract
Received: 2023-05-03	The aim of our study is to discuss the use of artificial intelligence-supported platforms, which have become increasingly popular in recent months, in the context of ethics, opportunities, challenges, and the role of the researcher. In this context, we analysed platforms such as ChatGPT, ChatPDF, Consensus, SciSpace, and Scite Assistant. Within the scope of our analyses, we concluded that various regulations regarding the use of AI-supported platforms in scientific research should be enacted as soon as possible. Although such platforms offer opportunities for researchers, they also bring challenges such as referencing and reproducibility of scientific work. Besides, the use of AI-supported platforms in scientific research also puts the role of researchers into question.
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Introduction

Humanity has been in continuous development and has made significant progress in many fields from the beginning of history until today. Especially in the last century, rapid technological developments have been seen all over the world with globalisation. Intelligence, which is the most important feature that distinguishes human beings from others, has undoubtedly been the most important factor in these developments.

Technological developments have shifted to a very different stage when scientists imagined that human intelligence could be transferred to machines and initiated studies in this field. After the second quarter of the 19th century, the process that started with the question of "can machines also think?" can be considered the beginning of artificial intelligence. As a matter of fact, the idea of "Stormed Search for Artificial Intelligence," which was put forward at a conference held at Dartmouth College in 1956, has continued to develop like a snowball until today (Mijwel, 2015; Simon, 1995).

Currently, many studies on artificial intelligence are being carried out in various fields. Especially since November 2022, with the peak of artificial intelligence through some platforms, especially OpenAI, this issue has started to be discussed again and deeply in the public, scientific and social field (Dwivedi et al., 2023). In order to carry out studies/activities



in these areas in an effective, efficient and safe manner, it is important to conduct research on artificial intelligence with its various aspects and consequences.

In this context, our research discusses the use of artificial intelligence and chatbots in scientific research without focusing on a specific discipline. In the study, we discussed and interpreted artificial intelligence and chatbots within the scope of ethics, opportunities, challenges, and researcher role supported by the relevant literature. We also proposed some recommendations based on the discussed issues. However, how artificial intelligence and chatbots work is beyond the scope of our research.

Ethical evaluation of the use of artificial intelligence platforms in scientific studies

The main purpose of a scientific study is to provide various suggestions for solutions to a problem situation. In order to conduct an effective scientific study, a person should read a lot about the existing problematic situation and think critically about the subject (Stepien et al., 1993). In our literature review (Buriak et al., 2023; Davis, 2023), we concluded that chatbots such as ChatGPT are inadequate, especially in terms of critical thinking, and they even provide misinformation. As a matter of fact, Buriak et al. (2023) stated that ChatGPT can invent references or false correlations, and therefore, the outputs obtained should be subjected to critical examination. Davis (2023) stated that in a short scientific conversation with ChatGPT, the programme gave false information about the subject. For this situation, Davis claimed that the programme deliberately lied to him and referred to a study that does not exist.

We can state that it is extremely striking that the programme refers to a non-existent study. This issue raises questions about the reliability of AI-supported platforms and also raises doubts about the functionality and accuracy of AI-supported solutions to the problem under investigation. As a matter of fact, in a literature search we conducted using Chatgpt, we found that it cited non-existent sources, and although it gave doi numbers in the bibliography, the relevant studies were either incorrect or did not exist in reality. In addition, when we told him that he had made a mistake in citing the sources, he apologised and stated that he had corrected it, but he still could not cite them correctly. Therefore, using AI-supported platforms raises questions about both the reliability and ethical aspects of the studies.

In addition, we started a conversation with ChatGPT first in Turkish, then in English, and finally in German about writing an article in educational sciences. One of our prompts was, "Are there legal and ethical limits to writing a scientific article? If so, what are they?". The programme gave us the following answer:

The sources you will use in your research should not contain plagiarism and should be reliable in terms of ethical rules. For this reason, you must properly cite the sources you will use in your research.

While we asked about the legal limits of the programme, it told us about the obligation of the authors. It also gave the responsibility for plagiarism and fake sources directly to the author.

When we asked the programme again about its legal limits, it gave the following answer:

The ethical limits of this artificial intelligence are the protection of personal data, interpretation by providing accurate information, and acting within the framework of the laws of the country where the research is conducted.

As a result, we have reached the conclusion that the programme does not consider it unethical to make use of artificial intelligence in writing an article in the field of educational sciences, from the literature review process to the analysis and interpretation of the data. Besides, it gives the responsibility for errors and possible problems entirely to the researchers.

If we assume that ChatGPT is a beginning, we can foresee that more advanced versions will be released by different companies in the future and that the problems mentioned above will perhaps be solved. However, we already see that many accounts labelled Ph.D. on social media are sharing videos on how to use ChatGPT. Therefore, we can say that such platforms will spread rapidly and will be abused a lot before the ethical problems are solved.

Although the ethical appropriateness of the issue is not clear for now, we think that people will not be able to help themselves by using such programmes. Although Homalak (2023) discusses whether artificial intelligence can be considered as an author and questions whether the author of an article written with artificial intelligence is the author of the article, the owner of the artificial intelligence, or those who developed it, articles in which ChatGPT is the author (ChatGPT & Zhavoronkov, 2022) have already been published. In fact, in an editorial article recently published by Buriak (2023), we see that they have written an editorial on how ChatGPT should be used in scientific studies and how ChatGPT should be utilised.

Limiting the issue only to ChatGPT is currently not very realistic. Because Baidu and Google have also stated that they will soon launch their own artificial intelligence platforms. Perhaps these programmes will be online by the time our article is published. Apart from this, there are many artificial intelligence-supported platforms, such as ChatGPT, SciSpace, Consensus, Scite Assistant, and ChtPDF, that are currently ready for use. Therefore, the issue should be addressed from a broader perspective, not only in a specific programme, and ethically inclusive principles should be determined.

It is possible to say that determining the ethical boundaries regarding the use of AI-powered platforms in the research process depends on academic authorities rather than researchers. Therefore, organisations such as the American Psychological Association (APA), and Committee on Publication Ethics (COPE) should quickly publish ethical and citation rules regarding the use of AI-powered platforms in the academic research process and provide solutions on how to determine whether researchers comply with these rules. In the process of writing our study, although one of APA's blog pages shared information about how ChatGPT can be cited and how to cite it, clear rules have not yet been determined. Besides, there is currently no consensus on whether AI platforms can be used in articles or not (McAdoo, 2023).

Additionally, editors and publishers of academic journals should quickly and clearly set out the ethical processes for their journals regarding the use of AI-powered chatbots in academic publications and indicate how this issue is (will be) handled.

As a result, it is urgent that the issue is addressed and evaluated by organisations such as APA and COPE, and journal editors and publishers should also develop policies on this issue. Therefore, as the authors of the study, we already have ethical concerns about the use of chatbots such as ChatGPT in scientific studies.

Opportunities that artificial intelligence platforms offer for scientific research

Although we do not consider the full use of artificial intelligence in scientific research to be ethically appropriate, at least for the time being until the necessary procedure is determined, artificial intelligence-supported platforms might offer opportunities for the scientific world when used correctly. These opportunities can be listed as time-saving, practicality, summarising relevant literature, and identifying research gaps. In fact, one can think of the opportunities brought by artificial intelligence as various programmes (SPSS, CMA, AMOS NVivo, etc.) and calculators. Without these programmes, scientists would analyse their data with paper and pen, but it has become much easier to perform analyses thanks to them. The biggest opportunity brought by these programs is that individuals who have difficulty understanding complex mathematical formulas can easily analyse their data.

With AI-supported platforms, individuals can save a significant amount of time (Homalak, 2023; Xu et al., 2021). This is because through AI-supported platforms, relevant literature can be summarised, and research gaps can be identified quickly. Indeed, van Dis et al. (2023) stated that the opportunities of AI-enabled platforms could accelerate the innovation process, shorten the publication time of studies, and make science fairer by helping people write fluently. While making these statements, they also expressed reservations that they may also reduce the quality and transparency of research and fundamentally change our autonomy as human researchers.

In terms of practicality, it is possible to say that artificial intelligence platforms in general and ChatGPT-like chatbots in particular offer researchers a faster research opportunity. For example, if you want to conduct a systematic review supported by meta-analysis in the field of educational sciences and you cannot decide what kind of analysis to do with the data you have, you can benefit from artificial intelligence platforms. In a Google or youtube search, you may lose a lot of time, and you may not always reach the right results. Therefore, we think that utilising artificial intelligence platforms in such matters will make serious contributions both in terms of time and practicality. Kasneci et al. (2023) identified artificial intelligence platforms as a potential area of interest and practicality due to the variety of applications they offer. Through the use of these platforms, opportunities to enhance learning and teaching experiences for individuals at all levels of education, including primary, secondary, tertiary, and professional development, may be possible. Furthermore, as each individual has unique

learning preferences, abilities, and needs, AI platforms offer a unique opportunity to provide personalised and effective learning experiences (Kasneji et al., 2023; van Dis et al., 2023)

Finally, researchers can get information about research gaps on a topic they are interested in through artificial intelligence platforms in a short time. Especially for master's and doctoral students, we can state that this feature will provide considerable practicality. Because as a result of long and extensive research on the subject of interest, the desired result may not always be achieved. We believe that when artificial intelligence platforms are used in this way, they will provide new perspectives for scientists. We also believe that after artificial intelligence, more studies will be conducted scientifically, and studies will be concluded and published in a shorter time.

Challenges of artificial intelligence platforms for scientific research

Artificial intelligence platforms like CahtGPT offer a summarised answer to a question posed by a person by filtering it from millions of internet sources. In this way, it attracts people, and it is a fact that such platforms are now used in scientific article writing (Liebrenz et al., 2023). Although there does not seem to be much difficulty in their use, there are various challenges related to the product that is generated. These challenges are the studies' distinctiveness, plagiarism, copyright, citation problem, inability to provide access (Thorpe, 2023), and inability to learn the scientific method in depth. It is stated that it will be very difficult to distinguish it from a normal study, especially when ChatGPT and ChatPDF-like programmes developed by OpenAI are used in the field of educational sciences and review studies (Natur, 2023). Considering that programmes such as Cahtgpt are still new, the next versions will be even more advanced and will be almost indistinguishable from manuscripts. We believe that this will pose a challenge for journal editors, reviewers, and thesis advisors. Especially when we consider that most of the outputs obtained from artificial intelligence platforms may be difficult to distinguish from human-written texts (Else, 2023), it is undeniable that copyright problems will also arise. Currently, the information on how and in what way a scientific text obtained by using artificial intelligence platforms should be presented and cited has not been clarified. It can be stated that this issue is seen as an important challenge to the use of artificial intelligence platforms in scientific studies.

The development and rapid spread of such platforms may lead researchers and prospective researchers to conduct incorrect studies without in-depth knowledge of their field. Hence, it is possible to say that artificial intelligence is likely to be an obstacle to the development of researchers. Especially for beginners in academia, the inability to learn the scientific method in depth and to comprehend the underlying philosophical thought is one of the most important challenges posed by artificial intelligence, because, through artificial intelligence platforms, the researcher can write the working method without any problems. The most important point here is to ask the right question. This can only be realised by someone who has a good command of research methods. Therefore, our biggest reservation in this regard is that individuals who are new to academia may rely on such platforms and structure their

studies incorrectly in terms of research methods and techniques. In fact, we can analogue this situation to a pilot in an aircraft cockpit landing the aircraft on the runway. You need to be able to use all the instruments in the cockpit and know how they all work, but if any of these instruments fail, you still need to be able to land that aircraft. Likewise, researchers should know how to utilise AI, but they should also have the ability to conduct research without it.

In the future, various restrictions may be imposed by APA, COPE, university boards of directors, and journal editors to enable the use of artificial intelligence platforms in scientific research. We think that this sector will be completely commercialised due to the intense interest in platforms. Currently, platforms such as ChatGPT, ChatPDF, and Consensus can provide free access. On the other hand, Scite Assistant provides paid access. For commercial reasons, in the future, all AI platforms may charge amounts that researchers with average incomes cannot afford. This may especially be the case for researchers in socio-economically disadvantaged countries and may lead to inequality of opportunity among researchers.

Another difficulty may be not understanding the difference between the real researcher and the researcher using artificial intelligence platforms. Although Homalak (2023) states that artificial intelligence platforms do not have comprehension and interpretation skills, considering that these platforms renew themselves in a very short time (Haleem et al., 2022; Shum et al., 2018; Yang, & Evans, 2019), it is possible to say that they will reach a remarkable level in high-level cognitive skills. For this reason, the discussion and conclusion parts of the researches that require cognitive processes at the level of analysis and synthesis can also be written by artificial intelligence.

This situation also poses challenges as to what the role of researchers will be in the research process. Is the person who prepares a publication only by asking appropriate questions about artificial intelligence and by providing the necessary data a scientific researcher or a computer operator? What will be the difference between a person who analyses all the data himself/herself and then synthesises and presents it in a scientific publication format? Probably, the publication of the researcher who uses artificial intelligence will be better than the second one in terms of both language and plagiarism results. Does this mean that he/she is a better researcher than the other? This situation leads to discussions about the role of researchers when it comes to artificial intelligence.

The role of the researcher in the age of artificial intelligence

The issues of artificial intelligence replacing human beings and what might happen in this case have been addressed in many films and books in a very striking way. The launch of ChatGPT in recent months has brought this issue to the agenda intensively, and it has already begun to be seen as a threat to dismiss many professional groups. A similar situation is also valid for scientific researchers. Artificial intelligence tools can search the literature, analyse and explain data quickly. This situation raises various concerns about the role of researchers in scientific research. For example, is using artificial intelligence and sending its results to a

scientific journal enough to be the article's author? Is asking the most appropriate questions about artificial intelligence and making maximum use of it a quality that puts a researcher ahead of others? What characteristics should a qualified researcher have in an environment where artificial intelligence can be used effectively in many stages of scientific research?

Surely, the answer to the above questions will change with the learning and self-development of artificial intelligence. However, there are still important roles for researchers in today's conditions. These can be listed as designing research, interpreting data in an original way, and taking into account the cultural structure of the country where the research is conducted.

We think that the interest in qualitative epistemology will increase with the development of artificial intelligence platforms. One of our biggest arguments in this regard is that, especially in qualitative epistemology, the role of the researcher is at the forefront, and data collection techniques such as observation and interview, which artificial intelligence may be insufficient, are unique to the researcher and the subject.

Another issue in which we think that the role of the researcher is effective is the interpretation and conclusion of the research results, especially in the national and cultural context. We think that artificial intelligence is not yet sufficient in this regard. As a matter of fact, in our chat with ChatGPT, we asked the question "Can you summarise the scientific studies written on migration in Turkey, and can you interpret the subject in a national context?" both in Turkish and English languages in Germany and Turkey locations. The programme addressed the question in a very different way according to the location in both English and Turkish languages. When the answers given by the programme are examined, it is seen that it answered the question in a biased way and by taking into account the location where the question was asked. For example, when the question was asked in Germany and in English language, it answered "as a language model, I do not have any prejudices, ideas or beliefs. However, I can give general information about the scientific studies on migration in Turkey", whereas in the Turkish location it stated that numerous studies have been carried out on this subject and started to summarise the subject.

In addition, we found that while the programme mentioned Kurdish, Arab, and Turkmen immigrants when the question is asked in Germany, it did not give any information about the nationality of immigrants when it is asked in Turkey. This can be seen as a remarkably advanced feature in terms of taking into account the sensitivities of the country where the programme is used. However, when the issue is considered in the context of scientific research, this appears as a negative feature and constitutes an example of researcher bias. In addition, the algorithm of the programme may be conducting location-based research in order to respond quickly, and this may cause it to evaluate the subject in a limited framework. We have no doubt that the next versions of such programmes will be even more advanced. However, when we evaluate the current version, it is possible to state that the role of the researcher is still very important and that artificial intelligence is insufficient in conducting scientific research.

Conclusion

This study focuses on the use of artificial intelligence in scientific research. In this direction, the use of artificial intelligence platforms from the preparation of an academic study to its publication is evaluated from the perspective of ethics, opportunities, challenges, and the role of the researcher.

It was concluded in this study that utilising artificial intelligence platforms completely in the structuring of scientific research is not appropriate in terms of academic ethics.

Artificial intelligence platforms, just like analysis programmes (SPSS, CMA, AMOS, etc.), will offer various opportunities for researchers, and when used correctly and appropriately, they can provide significant savings in terms of time. Thanks to such platforms, researchers will be able to publish faster and more.

Utilising these platforms will certainly bring various challenges to the academic environment. For example, a blog page of APA provides information on how to show the use of ChatGPT in the text and bibliography provided that the prompts are given. However, as we have stated in our article, ChatGPT gives different answers to the same prompts, and its answers differ according to the location connected. The purpose of citation is to enable other researchers to access the cited work and thus ensure the reproducibility of the scientific work. For this reason, we concluded that citing ChatGPT in its current version would not be appropriate.

Another challenge is the difficulty of distinguishing a scientific work created with such platforms from a human written work. Therefore, the lack of clarity on copyright and plagiarism poses difficulties for journal editors, referees and thesis committees.

Recommendations

Based on the relevant literature and the results of the study, the following suggestions have been developed. We hope that these suggestions will be especially helpful for thesis supervisors, journal editors, and referees who evaluate the articles.

- Especially from the perspective of journal editors, suggestions such as asking researchers to anonymise the raw data, to share files related to different stages of the research, to share a file with the academic sources they cite, and to mark the sections or sentences cited in academic publications can be put forward.
- It is currently unlikely that master's or doctoral students will have their entire thesis written by artificial intelligence platforms from beginning to end. At this point, attention can be paid to the difference in style that will arise for the detection of the parts written with artificial intelligence.
- Similarly, each author has his/her own sentence structure in the articles. While some authors write their works using the past tense, others prefer to use the present tense. In addition, grammatically passive and active sentence structures can be taken into consideration. Differences can also be partially detected based on this.

- The guidelines published or to be published by ethical organisations such as COPE should be carefully examined and adopted by the editors.
- Editors may personally request a declaration from authors. Unless the editors are against the use of artificial intelligence, it should be stated whether artificial intelligence is used or not in the article. This can also be stated in the thesis writing guidelines of universities.
- Since the current version of ChatGPT is insufficient for citation, APA and similar organisations should prepare guidelines on the use of artificial intelligence in scientific research as soon as possible.

Conflict of interests

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