The incorporation of generative artificial intelligence in the research and writing practices of Mexican scientists

La incorporación de la inteligencia artificial generativa en las prácticas de investigación y escritura de científicos mexicanos

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Abstract

This article examines the incorporation of artificial intelligence (AI) in the research and writing practices of Mexican scientists. Semi-structured interviews were conducted with researchers in the fields of biology, biological sciences, and biomedical sciences. The most common use of AI tools was found to be to improve, transform, and adapt texts, especially in correcting English manuscripts, thus facilitating publication in international contexts. Other uses include searches in the literature, suppchatort as a virtual tutor, preliminary data interpretation, and generation of programming code for statistical analysis. Only one participant uses AI as a research assistant to define objectives and methodologies. All participants agreed that AI improves their efficiency. However, they also identified significant issues such as plagiarism, information leakage, and academic dishonesty. They also de- nounced a practice they consider blatant: people presenting complete AI-generated texts as their own, a practice observed in both students and established researchers. Taking into account these challenges, it is essential to implement training programs, awareness campaigns, and establish updated ethical guidelines. The article concludes with recommendations to improve transparency and declaration of AI use in research.

Keywords: Scientific personnel training, Research strategies, Artificial Intelligence.

Resumen

Este artículo examina la incorporación de la Inteligencia Artificial (IA) en las prácticas de investigación y escritura de científicos mexicanos. Se realizaron entrevistas semiestructuradas a investigadores de las áreas de biología, ciencias biológicas y

ciencias biomédicas. Se encontró que el uso más común de herramientas de IA es para mejorar, transformar y adaptar textos, especialmente en la corrección de manuscritos en inglés, facilitando así la publicación en contextos internacionales. Otros usos incluyen la búsqueda de bibliografía, el apoyo como tutor virtual, la interpretación preliminar de datos y la generación de código de programación para análisis estadísticos. Solo uno de los participantes utiliza la IA como asistente de investigación para definir objetivos y metodologías. Todos los participantes coincidieron en que la IA mejora su eficiencia. Sin embargo, también identificaron problemas significativos, como el plagio, la filtración de información y la deshonestidad académica. También denunciaron un uso que consideran descarado: personas que presentan textos completos generados por IA como propios, una práctica observada tanto en estudiantes como en investigadores consolidados. Ante estos desafíos, es fundamental implementar programas de formación, campañas de concientización y establecer lineamientos éticos actualizados. El artículo concluye con recomendaciones para mejorar la transparencia y la declaración del uso de IA en la investigación.

Palabras clave: Formación de personal científico, Estrategias en la investigación, Inteligencia Artificial.

Introduction

In recent years, the integration of artificial intelligence (AI) in research has been a constantly growing trend. In a pioneering article, Hutson (2022) explained the potential applications of AI in various scientific fields. What seemed like science fiction at that time, as it was within reach of only a few, became a tangible reality in just one year with the arrival of ChatGPT. This chatbot, which only requires an Internet connection, allowed many scientists who had no prior contact with AI to begin integrating it into their writing and research practices.

According to the World Economic Forum (2023), this technology will bring profound changes to the job market in just five years. And one of the professions with a high probability of being 'augmented' is precisely that of scientists, as it can significantly improve their work.

Although there is abundant literature on the use of AI in science, most of them are essays, editorials, and opinion pieces, making empirical research highly necessary (Sallam, 2023). Furthermore, most of the research has focused on other regions, leaving an important gap with respect to what is happening in Latin America. In a context where AI is already beginning to modify the work of researchers, it is crucial to understand the changes that are occurring. This involves understanding not only how they are adapting to this technology and how they are leveraging it but also the problems they face. Therefore, the purpose of this article is to examine how Mexican researchers in the fields of biology, biological sciences, and biomedical sciences are incorporating AI into their research and writing practices. This study adopts a qualitative approach that allows for a comprehensive exploration of the modifications that occur in this field. The findings are expected to contribute to a better understanding of how AI is incorporated into academic and scientific fields in general.

Literature review

The history of AI can be traced back to Alan Turing (1950) who in his article *Computing Machinery and Intelligence* discussed the possibility of thinking systems. However, it is only in recent times that AI has experienced a true explosion in its capabilities, with such significant growth that it is transforming not only its immediate environment but also having social, economic, and political impacts on a global scale (Dwivedi et al., 2023). Generative AI, exemplified by platforms such as ChatGPT, Copilot, or Gemini, is characterized by three key attributes.

First, its ability to execute a wide range of tasks; second, its capacity to produce novel content similar to what a human would create; and third, the incorporation of user interfaces that allow intuitive interactions through natural language (Briggs & Kodnani, 2023). Undoubtedly, the most well-known is ChatGPT, which is a Large Language Model (LLM), that is, an architecture that allows natural language processing. But there are many other tools that enable the creation of audio, image, video or programming code, with a wide range of uses ranging from video game creation to business or science (Gozalo-Brizuela & Garrido-Merchán, 2023).

In the specialized literature, AI is mainly mentioned as a support tool for writing. Its primary uses are text editing, title suggestion, translation, content synthesis, stylistic refinement, and the creation of formal communication texts (Else, 2023; Golan et al., 2023; Kim, 2023; Santiago-Ruiz, 2024). Another use is bibliographic analysis. Vincent (2023) explains that, historically, literature review has been carried out using the technological tools of the

time, such as Index Medicus, PubMed, and now AI. According to the author, these tools will allow for more exhaustive and in-depth searches: "AI-based systems will not only access more articles, but they will also automatically select the most relevant and analyze their quality" (Vincent, 2023, p. 1). AI can also be used in various applications ranging from generating research ideas, receiving feedback on one's own work, and generating programming code (Bom, 2023; Hutson, 2022). In general, there is a consensus that AI could be a powerful ally, allowing time savings, increased efficiency, and improved productivity.

Despite its great features, this technology is not free from risks and problems. One of the most debated topics is that of false information, which stems from the propensity of LLMs to generate hallucinations, that is, responses that, although they sound plausible, lack sense (OpenAI, 2022). Hallucinations make it necessary to thoroughly review all ChatGPT responses (Sabzalieva & Valentini, 2023). Additionally, it causes texts created entirely with these tools, such as case reports (Alkaissi & McFarlane, 2023), reviews, or complete articles (Huang & Tan, 2023) to be plagued with inaccurate information or invented citations.

One of the great shadows hanging over AI is that it has been used to generate and publish hundreds of articles with the purpose of increasing productivity or the number of citations for certain researchers (Cabanac & Labbé, 2021; Van Noorden, 2021). This is a phenomenon that could be explained due to the demanding model of *publish or perish*. However, it should be noted that the widespread enthusiasm for ChatGPT has largely eclipsed this debate. However,

it is reasonable to assume that this practice will intensify with the adoption of LLM, since it was previously carried out with less sophisticated tools. AI has also raised dilemmas regarding the attribution of authorship, especially since ChatGPT was included as a coauthor in some articles (Grimaldi & Ehrler, 2023; Lee, 2023; Stokel-Walker, 2023).

In response, editorial policies have gradually begun to be established (Nature, 2023) which, in general, have the following rules: 1) it is suggested to use as a writing assistant, 2) LLMs cannot be authors or coauthors, 3) the use of AI must be documented and made transparent, and 4) human authors must be responsible for the text.

Some voices have pointed out the possibility that the use of AI could negatively affect analytical thinking, an aspect that is especially relevant in the training of new researchers (Hill-Yardin et al., 2023; Marchandot et al., 2023). In this regard, some adopt an optimistic perspective, suggesting that groups with limited experience could benefit tremendously from AI, as it might stimulate a creative process in a particular field of interest and/or identify gaps in the literature (Golan et al., 2023).

However, others express concern about the possible negative impact on intellectual development: "It can endanger students' willingness to develop skills like writing and researching, and, above all, a blind usage of ChatGPT does not build critical thinking and problem-solving skills, which are essential for academic and lifelong success" (Dwivedi et al., 2023, p. 27). As can be seen, AI is a rapidly evolving technology that presents significant opportunities, but also challenges for scientific research.

Methodology

Semi-structured interviews were conducted with ten scientists (Díaz-Bravo et al., 2013). The sample was obtained using a snowball technique. Participants had to meet the following selection criteria: 1) actively conduct research in the areas of biology, biological sciences, and biomedical sciences 2) have at least a doctorate degree, and 3) use some AI tool for their research or writing. The characteristics of the participants in this investigation are detailed in Table 1.

The interviews lasted between 18 minutes and 1 hour. They were conducted online via the Zoom platform during February, March, and June 2024. An informed consent letter was provided, and anonymity was ensured. The interviews were transcribed using the Word tool and corrected by a human. Subsequently, they were processed using a thematic analysis technique.

Results and discussion

General characteristics of AI usage

The first contact with AI varied. In one unique case, it arose from family recommendations: "it was thanks to my husband, who explained to me that they existed and how I could use them" (Anabel). Some others received advertisements in applications and social networks: "It appeared when I opened the Edge browser" (Joana) and "Facebook started to make a lot of propaganda about this AI thing" (Nicolás). On the other hand, for most participants, the introduction to AI came from people within their academic environment, such as colleagues or students. This is the case for Constantino: "it was through a colleague's recommendation"; for Samara: "one of my colleagues was just going to work on

Table 1

Participants

Pseudonym	Level	Research line	AI tools	Time using AI
Anabel	SNI 1	Placenta	ChatGPT	8 months
Samara	Ph.D.	Breast cancer	ChatGPT Consensus	1 year
Joana	SNI 3	Vitamins	Copilot	1 year
Sandra	SNI 2	Infections	ChatGPT	6 months
Nicolás	SNI Candidate	Infections	ChatGPT	1 year
Constantino	SNI 1	Adipose tissue	DeepL	6 months
Aurora	SNI Candidate	Plant physiology	ChatGPT	2 months
Javier	SNI 1	Ecology	ChatGPT Scispace	1 year
Ramiro	SNI 1	Breast milk	Copilot ChatGPT	6 months
Erik	SNI 2	Biomedical sensors	ChatGPT Writefull	8 months

Notes: (1) In Mexico, the National System of Researchers (SNI) is a program aimed at promoting the scientific, technological, and humanistic research activities of outstanding professionals in various disciplines. It is granted by the National Commission for Science, Humanities and Technology (CONAHCYT) and includes both a recognition and financial incentive. There are several levels, each more prestigious than the previous one: candidate, 1, 2, 3, and emeritus. (2) The research line is expressed succinctly to protect anonymity.

an artificial intelligence project" and for Sandra: "because students started talking a lot, especially about ChatGPT". This highlights the growing use of these technologies in academic and scientific settings.

It might be assumed that, given the highly specialized nature of their research, participants would opt to use paid versions of these applications; however, this is not the case. It is notable that all participants use free versions, as Joana expressed emphatically: "Yes, of course it's free, as if I'm going to pay".

The ways in which prompts are written vary considerably. Some provide detailed instructions like Samara: "I need this message to be very assertive to communicate this need, but without ceasing to be friend-

ly". Although most prefer to use direct and concise instructions. A notable example is Sandra's method, who uses a single word: "I always use 'improve', 'improve' colon and then I input the text, it's my favorite". From what the participants mentioned, it can be inferred that complex prompts are not necessarily required, but rather knowing when and how to apply them.

Writing assistant

The applications of AI as a writing assistant are diverse and encompass aspects such as style correction, translation, summarization, and title creation, as well as adapting a manuscript to different contexts. Undoubtedly, the most recurrent use is to improve English style. Previously, participants devoted a significant amount

of time and effort to correcting their manuscripts, often having to allocate part of their research budgets to pay for specialized editorial correction: "paying for editing is extremely expensive" (Sandra). Currently, in contrast, they entrust this revision to AI: "most of the time we had to send it to an editor for style correction, and now there are entire paragraphs that I put into the chat for style correction" (Sandra) and later: "for the first time with the chat correction, we didn't receive any style correction remarks" (Sandra). The results are impressive, and several participants claim that their works corrected with this technique are already in the process of publication: "last month, the first article where I use these tools was submitted, and it has optimized the correction time" (Constantino); "we have two [articles] corrected by ChatGPT right now" (Sandra) and: "I submitted two book chapters, and it also helped me a lot with the English" (Nicolás).

As high-level researchers who need to communicate abroad, AI tools have proven to be very useful, for example, during presentations or conferences: "I had to introduce a researcher, and although I knew how to do it, I had many doubts. So, a friend suggested that I ask ChatGPT for help to create a presentation script" (Anabel). It is also widely used for formal communications with colleagues or editors: "to write emails, to confirm that what I am writing has the intended meaning, because sometimes there can be certain colloquialisms that we don't necessarily manage" (Samara).

Generative AI tools are also capable of generating peritexts, which are texts that complement the original. For example, they can assist in creating titles: "this past week, I used it for titles, I tell it what I want, and it creates such bombastic titles for me" (Sandra). Titles are of great relevance as they not only describe the research but also need to be attractive and engaging, potentially increasing the chances of gaining more readership or funding. Similarly, it is possible to ask the AI to adjust the size of a text to a specific number of words. This is useful, for example, to meet the strict length requirements in research funding applications: "I have a project I wrote, and now I am submitting it for funding purposes. So, to avoid rewriting everything with a specific word count, I tell it to summarize it in so many words" (Joana). It is even possible to completely adapt the tone of a text for dissemination purposes:

Yesterday, we had to submit something for outreach, which was a 100-word piece. So, super family-friendly, talk about our research projects. So, I went straight to ChatGPT and said, look, help me write a super-friendly text. I mean, I wrote my awful text, we work with this, with that, make it nice for me. And so, it made it for me from the start, like, let me invite you to see my lab (Sandra).

The researchers mentioned in the previous paragraphs use general tools such as ChatGPT or Copilot. On the other hand, Erik is the only one using a specialized AI, Writefull, to prepare his articles before publication. This platform is designed to correct articles that are already finished or in an advanced draft stage, with the main function of perfecting them before submission.

It checks the classic structure of the article if it has the title, the abstract, corresponding authors, keywords, references, conflict of interest statement, all these major

headings that are usual in an article. Basically, they tell you if you are missing any section, if it meets editorial criteria, how the figures are, and if they are mentioned. Some even reach such refinement that they tell you, hey, you have figure number 5, but it is not mentioned in the text. That part of more nitty-gritty work is what can suddenly simplify for you (Erik).

Most participants perceive the use of AI as a writing assistant as legitimate, similar to using integrated tools in word processors: "for me, it's like using the tool that comes in Word to check my spelling" (Joana). Several participants (Nicolás, Constantino, Ramiro, and Erik) state that using AI in this way brings them peace and calm, as it helps them overcome their difficulties in writing in English. By acting as a writing assistant, AI allows them to maintain full control over their research; essentially, it remains their results and ideas but adapted to another language, for specific platforms or target audiences. In this sense, AI can be seen as a futuristic typewriter capable of transforming text in a complex and profound way.

Research assistant

In this context, AI is used to help define objectives, formulate hypotheses, design methodologies, and make corrections suggested by reviewers. Javier is the only participant who uses AI in this way. He explains that one of his articles had been rejected multiple times over the past few years, and due to all the changes suggested by the reviewers, it had lost its original essence. So, he turned to ChatGPT for suggestions on how to recover certain points of his text:

It suggested that in the introduction I could say this, in the methods I should say that,

in the results I should state this, and in the discussion, I should mention that. From this analysis, it suggested a couple of paragraphs for each section. We did recover some ideas from those paragraphs, especially the hypothesis, as it was well written. I felt it captured what I wanted to say (Javier).

Javier took a free course offered in the Facebook groups of Mexican researchers belonging to the SNI. This course promises to teach how to "train" ChatGPT to leverage it for research, speed up literature searches, and adapt it to one's writing style. Based on Facebook comments from the person offering the course, ChatGPT Plus and plugins such as Zapier are used. According to Javier, he learned the following aspects in the course:

You can teach it about your topics. For example, you can tell it, I want you to learn about this topic, what these three authors say. The definitions given by such and such on this topic. And then, based on what I taught you, help me write an objective or a research question or a method. Or from this article where this method was used, help me write how I can use this method in such a situation (Javier).

Javier's feelings about this are ambiguous. He claims that he maintains control of his research since he decides which suggestions to apply, but he also has some doubts. For instance, the coauthor of the article, his graduate student, openly expressed feeling uncomfortable using AI in this way:

He told me that he would feel bad for following its advice. And I told him, it's not that it's giving us the idea, but it's working from the idea I gave it. We didn't ask it to solve this article that has been rejected

1,000 times. No, we said, we want it to say this, help us say this (Javier).

In another part of the interview, Javier hints at a feeling of guilt: "a certain guilt or I don't know what else to call it" (Javier). He reflects on the dangers of abusing this technology: "At what point do you stop being the one writing? So far, I feel like it's been me, but I think it's very easy to eventually leave it all to it" (Javier).

Searching, explaining, analyzing: new ways to access knowledge

AI is also being integrated into various aspects of research practices. Its applications are diverse, and here they are classified into three main groups: literature search, resolving queries (akin to tutoring), and data analysis.

The first of these, literature search, is a strategy employed by Samara, Joana, Javier, Ramiro, and Nicolás. For example, Nicolás explains that he needed to know when a particular technique was first used, and ChatGPT allowed him to find the original source: "It told me that such a technique for the classification of E. coli was by so-and-so in such a year, and then of course I went to PubMed. So, doing the search there, I found the article" (Nicolás). This researcher used the clues provided by ChatGPT to then search for a specialized database. However, other tools facilitate direct access to government or research documents. Such is the case with Copilot: "it gives you the reference, you click on the little number, and it takes you there, all very easy to use" (Joana). Another similar application is Consensus, which also allows access to specialized references:

Consensus takes a screenshot of the section containing the information you are looking for, so instead of reading the entire article or all the articles and then following the thread, it helps you focus your search much better (Samara).

Samara stands out as the most experienced user in this regard, as she can use ChatGPT as her first tool to better understand a topic and then access specific documents through Consensus.

AI can also function as a kind of tutor to resolve doubts or explore topics they do not fully master (Joana, Sandra, Samara, and Nicolás). The queries of these participants cover methodologies, laboratory techniques, and the use of specialized software. For example, Joana explains:

What would I have done on other occasions? I would have had to go to Maniatis. And now look for the buffer, now look for the other buffer, I would have taken 3 centuries longer and then once I found both, see how they differ, what the differences are. I would have had to do it manually, it would have taken much longer, maybe 1 hour, and here it took me 3 minutes (Joana).

On the other hand, Sandra asks one of her students to consult ChatGPT about how to perform certain actions in SPSS: "Before we had our friend [ChatGPT], we used to watch YouTube videos, but it was very time-consuming. So, the chat says that it is in the file tab, and then quickly he gets it" (Sandra). And Nicolás uses AI to advise him on using Matlab and Cytoscape:

ChatGPT says to load such a library under such conditions to get the network, or search for metabolism genes, search for such and such, so you can build it. Then it gives your ideas for building the network or things related to expression, things that

I would never have imagined. And then it gives you an idea, and you go and search for more (Nicolás).

The interviewees are immersed in an environment that requires the constant acquisition of new laboratory techniques and software skills. This demand drives them to seek new sources of knowledge to stay updated: "I always tell [my students], just take a course, and they say no, the chat helps me" (Sandra). In this context, AI is partially replacing traditional ways of resolving queries and obtaining continuous education, such as search engines, tutorials, videos, or courses, due to its efficiency, speed, and ability to personalize responses.

The final use of AI observed among participants is for data analysis and processing. Nicolás takes his databases and inputs them into ChatGPT for a preliminary analysis. Samara uses the same tool as a first approach to interpreting her results.

I ran some tests to see if a group of proteins had correlations. You can do this in a database. But often, most researchers do not necessarily know how to handle databases. So, I think ChatGPT is an easy way to approach these things before going to the database to understand it.

I simply asked it which process these proteins might connect in, and I provided the list. And then it told me, this protein does this, and this protein does that. And then I said, oh, okay, if both are involved in glycolysis, then it's through metabolism that they are connected (Samara).

Its use in statistical analysis can go even further. For example, Ramiro uses it to determine "the best statistics for such study groups." Nicolás generates code in the statistical analysis language R, in a process

that involves searching for existing code, adapting it to his needs, and refining it:

What I do is download R codes, and based on what I'm asking it, I say, hey, make me a pool between this code and that code because what I need is a scatter plot. So, it pools the codes and generates a new code. Of course, you have to adjust it, but ChatGPT does the bulk of the work (Nicolás).

From these observations, it can be concluded that artificial intelligence has a very diverse use in scientific research. Its applications range from learning new software to improving statistical analyzes and are summarized in Table 2.

From Efficiency to taboo: perceptions on AI

All participants highlight as an advantage of AI its ability to increase efficiency: "I think the main benefit is speed, and at the same time, providing you with a text that reads smoothly" (Anabel). This is undoubtedly why they continue to actively use these tools in their research. However, along with these advantages mentioned, certain problems also arise. These problems can be divided into two groups: those with identified solutions for which mitigation strategies have been developed and those that are more complex and profound and still lack solutions.

Within the first group of problems, the one that stands out most among participants is the lack of accuracy in information, also known as hallucination: "Not everything that ChatGPT outputs will be accurate, so I have to verify it" (Samara). This risk is present, but nearly harmless, because all participants conduct thorough verification of the answers they receive. The next perceived risk is data leakage: "My main fear

is data theft, that the data end up being somehow identified by other groups who could beat me to publication" (Anabel). To combat this latter problem, participants have developed the strategy of modifying or removing sensitive information before inputting it into AI platforms: "What I do is include a paragraph where there's no personal or private information at all" (Samara). Unlike other groups, such as university students (Santiago-Ruiz, 2023), participants are informed about the risks associated with the use of this technology, enabling them to develop strategies to counteract them.

On the other hand, there are also two problems that they are unsure of how to confront. The first of these is inadvertently using information belonging to others: "It can even give you information that you shouldn't use. For example, if it's someone else's original idea" (Joana). This is a serious issue related to a significant lack

of clarity regarding copyright and AI. The second problem is what Joana and Nicolás describe as the 'blatant' use of LLMs to create repetitive texts lacking analysis. Joana explains: "I realize that [a student] simply asked ChatGPT or who knows whom 'translate this for me' and put it as is." And Sandra adds: "I worry, for example, seeing very well-written texts, and it's evident during seminars that they don't understand anything."

Several participants (Joana, Sandra, Nicolás, Aurora, and Ramiro) have encountered the challenge of academic dishonesty. However, none of them has come to a clear solution on how to address it: "Before, we used to have them read and do exercises. Now it is getting more difficult because they can even ask the chat to summarize a reading for them, so it is complicated (Sandra). Ramiro explains that he encourages its use only among his graduate students, but not among un-

Table 2

Uses of AI in research

General Use	Specific Use
Writing Assistant	• Writing Improvement • Translation • Generation of peritexts (titles, abstracts) • Adjusting length • Adapting to another context (scientific dissemination or creating a report from an article)
Information Search	• General information • Panoramic bibliography search (when was the first time it was reported…). • Specific bibliography search (give me references about…)
Research Assistant	• Objectives • Hypotheses • Methodology • Applying reviewers' corrections
Data Analysis	• Preliminary data analysis • Preliminary statistical analysis • Assistant in selecting statistical tests • Programming code (R, Matlab)

dergraduates because "they are not really trying to enhance their research skills or information integration".

This problem occurs not only among students, but also among established researchers. Joana recounts her experience as a reviewer of a paper:

In this case, it was a journal with a very high impact factor, above 5, and I realized that AI had been used blatantly. So I replied to the editor and the author and told them that the writing strongly suggested AI had been used, and I wanted them to disclose it, to say it. Then the author was very honest and said 'yes, indeed, we used an artificial intelligence tool to write it,' but the editor didn't care and published it anyway. I don't think even the disclosure was made. So I think that's wrong, really, because the article clearly showed signs of that. For example, it was very repetitive, redefined things that were already defined, repeated certain ideas but written in a different way (Joana).

This is something researchers consider to be one of the despicable uses of AI. Joana says: "it's really a plague, a very nefarious thing, plagiarism or copy-paste, or that your mind no longer works, but it's all through a robot." Nicolás shares similar sentiments: "they don't understand what it's doing, therefore, it's not making their work easier, it's doing the work for them." Unfortunately, the blatant use of AI is a reality and undoubtedly poses the risk of replacing the thinking capacity of both young and established researchers.

Despite using AI tools in several of their publications, none of the participants have declared their use. This is in part due to the fear that editors would reject their papers. Additionally, the participants argue

that there are no clear criteria for making this declaration: "Well, yes, how do you declare it? That is when you think about what concepts the editors have about this because that's entering a void" (Javier). Erik, as an organizer of a conference, emphasizes the importance of declaring the use of AI and following the lead of major scientific publishers adopting a transparency policy.

We are required to run articles through plagiarism detection software, but some now also detect the use of AI tools. There was a case where the software alerted us, saying hey, be careful, because it looks like these types of tools were used here. But since we do not have a declaration of whether these tools were used or not, we could not do anything about it. That's why we're moving towards clearly stating the rules to tell you what can and cannot be done (Erik).

This variability, between being extremely efficient and dishonesty, leaves participants uncertain about AI. On the one hand, they recognize its importance, but also view it with reservations: "it seems like we all hide it, it's like our toxic boyfriend" (Sandra). While AI is already being actively used in scientific environments, a taboo is also emerging. A taboo related to fear of plagiarism and blatant use, which greatly hinders open dialogue about this technology.

Conclusions

AI and LLM have a wide range of practical applications and provide significant benefits to researchers. All participants strongly agreed that using these tools helped them save time and become more efficient. AI particularly stands out as a writing assistant, which is expected to some extent, given that LLM are designed to understand

and process natural language. In this area, participants leverage AI through a variety of strategies. For instance, to generate specific sections of a document such as titles and abstracts. Moreover, it is commonly used to adapt a text to different contexts, such as re-fine a project into an article or scientific outreach material. However, the most frequently mentioned application is manuscript editing in English. In this regard, AI facilitates the integration of Mexican scientists into an international research environment and offers greater opportunities for publication in high impact journals.

AI can also be extremely useful in other phases of research. For example, it can assist in refining objectives or selecting methodology. It should be noted that its use as a research assistant is less widespread and more controversial. Additionally, AI is immensely valuable for information retrieval, especially in a context where the production of scientific literature is overwhelming. Therefore, it would not be surprising if future standards for review articles were modified. Currently, PRISMA incorporates specific aspects of search engines, such as keyword usage. Thus, it is plausible that future guidelines will be updated to include features this technology.

The field of AI tools is evolving rapidly. While ChatGPT is the most well-known application, there are many others. Copilot is general-purpose; DeepL and Scispace specialize in paraphrasing and text correction; Consensus is designed for bibliography management, and Writeall focuses on manuscript preparation before submission. Each tool has specific capabilities and limitations. It seems that this proliferation of AI tools will only increase in the future. It may not be sufficient to know just one tool; rather, it will be necessary to use several depending on their utility in different research phases.

Despite the significant advantages that AI can offer, this technology also brings potential problems such as plagiarism and information leakage. However, the greatest perceived risk by participants is what they have termed *blatant use*" This refers to the practice of presenting entire texts or extensive text sections generated by LLMs as one's own work. The result is documenting lacking depth, analysis, and creativity. This phenomenon appears to manifest at all levels, from students to researchers publishing in high-impact journals.

Recommendations to improve transparency

It is crucial to explicitly disclose the use of AI, as transparency is one of the cornerstones of scientific work. Currently, although AI is widely used in research, there is a significant regulatory gap. Therefore, it is necessary for educational institutions, publishers, and specialized journals to establish clear guidelines regarding the use of AI. Furthermore, it is essential for the authors to declare how they employ these tools. So far, none of the participants have declared their use of AI, sometimes because they have not been explicitly required to do so, and other times due to fear of editors' opinions. Moreover, there are no clear guidelines on how to explain the use of AI. Therefore, the following recommendations are provided to enhance transparency.

- Explicitly state the AI tools used. Each tool is designed for specific purposes and has different capabilities and limitations. Therefore, understanding these characteristics is important to evaluate their impact on research.

- Detail the application method. Provide a detailed explanation of how AI tools were used, highlighting the research phases or the sections of the manuscript where they were implemented. This provides a clear context and enables readers to understand the role AI played in the process.

- Explain the prompts. Prompts can significantly influence results, so it is advisable to describe them. This will help to reproduce and evaluate the research more effectively.

Based on the findings of this research, it can be concluded that the extensive functionality of AI suggests that it will increasingly take center stage in research in the future. The changes that AI is bringing to academic fields are substantial and alter the way information is accessed, analyzed, and written. Researchers who master these technologies undoubtedly have a significant advantage over those who do not. However, all of this is hindered by issues such as blatant use and new forms of academic dishonesty. Analytical thinking, creativity, and transparency are essential components of scientific work. However, indiscriminate use of AI jeopardizes these principles. This undoubtedly threatens the development of new researchers, as several participants point out that many opt for the easy path instead of developing their cognitive abilities. Additionally, in today's context, which demands constant article production and where high citation numbers are crucial, excessive use of AI could undermine the scientific publishing system. Currently, it is important to promote positive uses of AI while limiting negatives. This will not happen spontaneously but requires us to create the right conditions to achieve the best results. Therefore, it would be necessary to overcome the taboo and implement training programs, awareness campaigns, and updated ethical standards.

Declaration on the use of AI

The ideas, arguments, conceptual definitions, research design, and interpretation of the data are original creations of the author. ChatGPT was used to accelerate the writing process and correct Spanish drafts with the prompt *improve the writing*. Once a final version of the manuscript was reached, ChatGPT was used with the prompt *translate to English*. The author reviewed this translation to ensure coherence and accuracy.

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