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CHALLENGE OF ARTIFICIAL INTELLIGENCE IN THE PROCESS OF SCIENTIFIC RESEARCH AND PUBLICATION: A SYSTEMATIC REVIEW OF THE LITERATURE OF LATIN AMERICA

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ABSTRACT

Objective: To analyze the challenges associated with the incorporation of artificial intelligence (AI) in the exploration of scientific-academic research and publication in Latin America. Methodology: the adaptation of the Prisma Protocol was used as a scientific reference, articles were addressed from the Scopus and Ebsco databases, on the Crossref platform and the Google Scholar repository. Result: 2251 documents were initially considered, where 13 met the inclusion criteria. Specific challenges can provide a solid basis for future research and foster collaborations that lead to eradicating resistance to AI and improving the research method for producing scientific publications, in areas that deserve attention such as academic institutions and scientific communities to develop strategies that overcome barriers and enhance the opportunities granted by AI. Conclusion: Addressing AI-related challenges in Latin America is a way to strengthen research and development (R+D) in the region, by promoting more inclusive, ethical and technologically advanced science.

Keywords: Artificial Intelligence. Research Process. Scientific Publications. Research.

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INTRODUCTION

The methodologies and practices implemented in various disciplines are transformed in a different way. significant by AI, intervening in the development of scientific research and publication (Cortés, 2024). It is also relevant to mention generative artificial intelligence (AGI), when launching chatGPT in the educational field, which was presented as the first global orientation of the United Nations Educational, Scientific and Cultural Organization (UNESCO), with the purpose of implementing practices that support countries to enhance human capacities supported by guidelines for Long-term sustainable policies (Miao & Holmes, 2023).

In this sense, AI is defined as a self-learning tool that is based on current knowledge available online with variable combinations of accuracy, errors and biases; in addition, research plays a fundamental role in various aspects of academic writing, this ranges from the generation of ideas and the conduct of studies to the delimitation and organization of contents. as well as checking grammar and syntax, and offering suggestions for improving the text. The increase in AI technology has the potential to radically transform academic research and writing processes, allowing results to be obtained more quickly and accurately (Acosta & Andrade, 2024).

Thus, providing information for academics, practitioners and policymakers is fundamental and important; since, AI has revolutionized research paradigms and methodologies, improving both innovation and data-driven decision-making; This increases the accuracy of predictions. This paradigm shift supports a more agile approach to scientific research that allows researchers to better focus their efforts accurately and quickly on more complex and perplexing problems (Subharun, 2023).

Likewise a fundamental aspect of how AI is transforming research methodology, is that it allows you to identify complex patterns in data, by facilitating analyses that were previously difficult to perform. However, despite the benefits, AI comes with concerns about algorithmic biases and the privacy of study participants, which requires an ethical and responsible approach in its implementation (Ruiz 2024). It also has the power to transform research and publishing, but it must be used responsibly and maintain the integrity of research, without replacing human experience or critical thinking (Buchanan, 2023).

In this way, AI allows researchers to perform very quickly by automating repetitive tasks, minimizing the time cycle to discovery, significantly transforming the process of scientific research and publication, improving efficiency and accuracy at various stages of the scientific method, by optimizing information search, article writing and data analysis; in addition, it is proposed to consider ethical and technical challenges that contradict the

proper use of AI (Benvenuto-Vera, 2023). It is clear that there are relevant challenges to address in the field of research.

In this sense, different studies have shown, through analysis of empirical data, that AI has become an invaluable ally for researchers by facilitating progress towards a future in which the limits in science are constantly expanding. This powerful technological tool is emerging in education as one of the greatest promises for scientific innovation in the coming years (Vimos-Buenaño et al. 2024).

Regarding educational changes and the research field, a rigorous review must be carried out, centered on the person and that contributes to improving human capacities by building digital futures that are inclusive, only in this way can the potential of AI and other categories used in the educational field be guaranteed(Miao & Holmes, 2023). Therefore, by addressing the challenges related to AI in Latin America, this study will contribute to strengthening R+D in the region, promoting a more inclusive, ethical and technologically advanced science that responds to an academic process of scientific quality and novel in the diversity of knowledge.

On the other hand, the implementation of AI also poses significant challenges, such as resistance to change by educators, lack of adequate training, and technological limitations in educational institutions. These barriers need to be overcome in order for AI to be integrated into the research process productively. Although AI has proven to be a powerful support tool, there are no clear indications that it will replace teachers in their role as researchers, since the construction of a humanized education remains irreplaceable (De Vasconcelos et al. 2024).

In view of the above, systematic review methods were used to collect and analyze information from different databases, the objective of analyzing the challenges associated with the incorporation of AI in the exploration of research and academic scientific publication in Latin America was formulated in this study during the period 2020, 2023 and 2024, investigating and discussing the concepts, contexts and applications related to the topic under study, by revealing what is sought to be understood from its data and what can be contrasted on the basis of the publications found.

METHODOLOGY

The study refers to a systematic review of the literature regarding the associated challenges that may arise when using AI as a technological tool in the development of scientific research and publication in Latin America. To carry out this review, the topic was identified and the knowledge-generating question was formulated , criteria for inclusion and

exclusion of studies were established, categorization and evaluation of the selected articles, based on results that emerged from their analysis.

From the articles analyzed, an exhaustive search process was carried out of the different scientific literatures, in order to carry out a systematic review, the adaptation of the Prisma Protocol was chosen as a scientific reference; since it is designed for authors of systematic reviews; Thus, it was documented in a transparent manner using explicit methodology to identify, select and critically evaluate the research, in order to serve as a reference for different investigations (Page et al., 2021).

The research of the articles was carried out considering the databases of Crossref, Google Scholar, Scopus and Ebsco. For Crossref, the search by words of the title "artificial intelligence, research process, scientific publications" was used as a strategy; in the case of Google Scholar, the combination with the Boolean term "AND" was used: with three descriptors ("artificial intelligence") AND ("research process") AND ("scientific publications"); also, by words of the title "artificial intelligence, research process"), resulting in 600 articles in Crossref, and in Google Scholar four articles were found. The strategies used for Scopus and Ebsco were ("artificial intelligence") AND ("research") AND ("scientific publications") resulting in 1628 articles in Scopus and 19 articles in Ebsco. From this initial search, 2251 investigations were found .

For the principles of eligibility, articles that present specificities with the topic, complete and open access articles, in Portuguese, English and Spanish withperiods between 2020, 2023 and 2024, which addressed the research title in its two variables under study, were included.

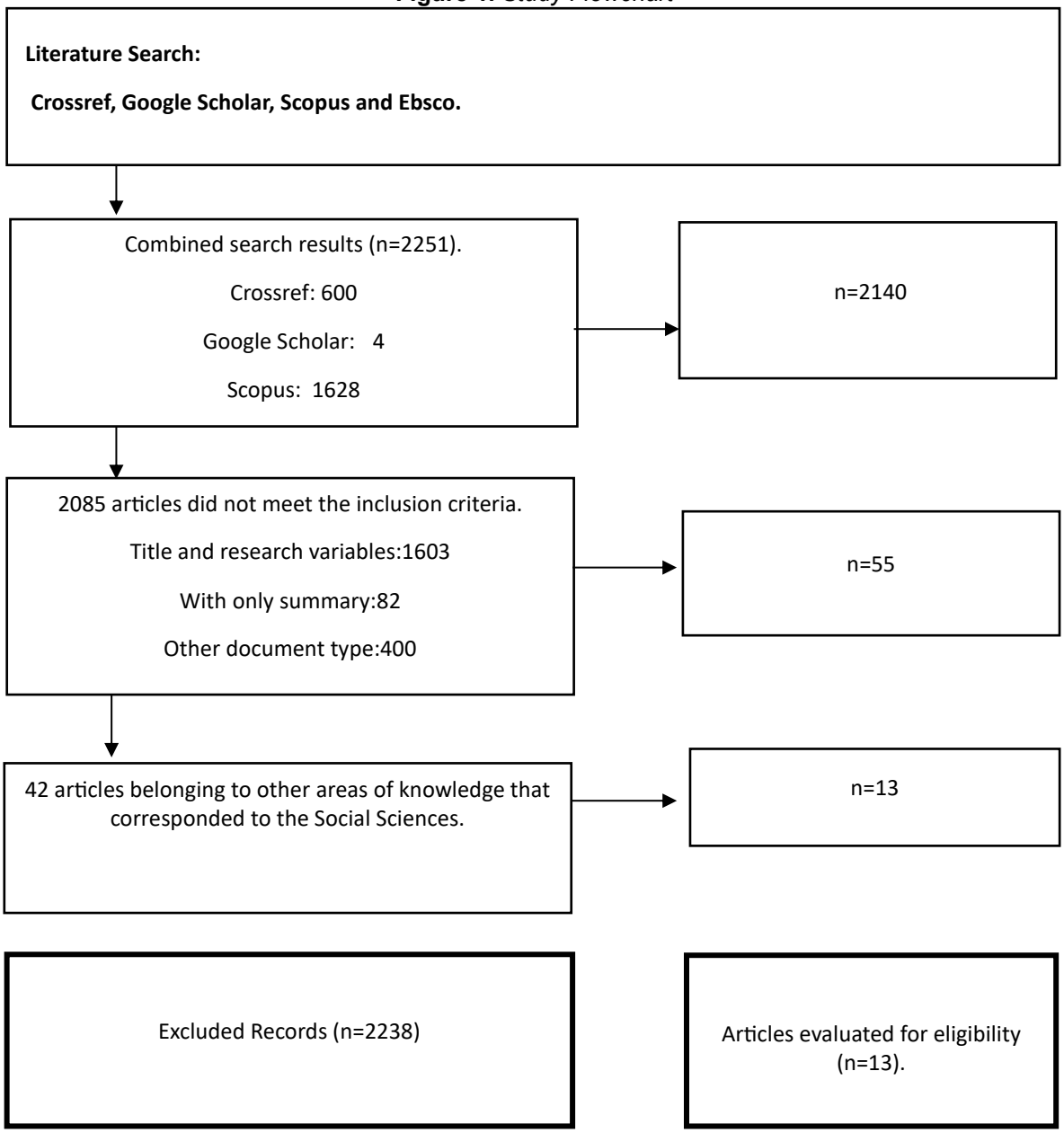
Regarding the exclusion principles, studies whose variables differed from the title of the research were omitted, articles whose validity has expired, those that only have an abstract and have restricted access to the full text. Likewise, non-indexed articles, theses or books, duplicates and articles in languages other than English, Portuguese and Spanish, as well asthose productions far from the subject, in areas of knowledge other than the Social Sciences, were not considered.

After this rigorous selection, 2238 articles were removed from the research, 13 articles were selected to compose the final collection of the study and to satisfy the eligibility criteria. These articles provided the basis for an in-depth analysis of the challenges of using AI in the process of scientific research and publication.

RESULTS

This section presents the findings, based on data collected by researchers. The initial search yielded 2251 articles, of which 111 were excluded because they were not open access. 2140 were analyzed considering the title and the variables that make it up, complete articles, and by the type of document, 2085 publications were omitted, which did not meet the inclusion requirements, leaving 55 articles, of which 42 were from other areas of knowledge, a total of 13 articles were selected under the principles of eligibility, as evidenced in Figure 1.

Figure 1. *Study Flowchart*



Note. Total number of articles to be evaluated, total frequency of research included = 13

Based on an exhaustive search and analysis, Table 1 presents the 13 articles selected to develop the research, organized by author(s), country, search source, title and type of study.

Table 1. *Visualization of the articles included in the systematic review*

Author(s)/ Year	Country	Search source	Title	Post Type
Acosta & Andrade, 2024	Ecuador	Crossref	Artificial intelligence in the field of research and the preparation of academic documents.	Original article
Cedeño-Tapia, 2023	Argentina	Crossref	Artificial intelligence as a complementary tool in research and education: ethical and human responsibility.	Editorial
Suárez et al., 2024	Ecuador	Google Scholar	Artificial intelligence in the improvement of the scientific research process among the teachers of the Simón Bolívar Higher Technological Institute.	Original article
Gomes, 2023	Brazil	Scopus	Artificial intelligence and co-authorship in scientific papers: reflections on the use of ChatGPT in scientific research and writing.	Practice
Juca-Maldonado, 2024	Ecuador	Crossref	The impact of artificial intelligence on academic and research work.	Original article
Mena-Guacas et al., 2024	Colombia	Scopus	Artificial intelligence and its scientific production in the field of education.	Original article
Ruiz, 2024	Ecuador	Crossref	Implications of artificial intelligence on research methods.	Systematic review.
Sánchez-Céspedes et al., 2020	Colombia	Ebsco	Study on the generation of scientific articles in the field of artificial intelligence applied to the development of public policies.	Original article
Suazo, 2023	Chile	Crossref	Artificial intelligence in scientific research.	Original article
Sued, 2024	Mexico	Crossref	The generation of scientific knowledge in Mexico on Artificial Intelligence: a bibliometric study.	Original article

Author(s)/ Year	Country	Search source	Title	Post Type
Torres-Gómez, 2024	Mexico	Crossref	Information and perception needs about artificial intelligence tools in doctoral students in educational research in Tlaxcala, Mexico.	Original article
Vázquez and Mendoza 2024	Venezuela	Google Scholar	Artificial Intelligence in the research process	Original article
Vimos-Buenaño et al., 2024	Ecuador	Crossref	Application of artificial intelligence in the scientific research processes carried out by university professors.	Original article

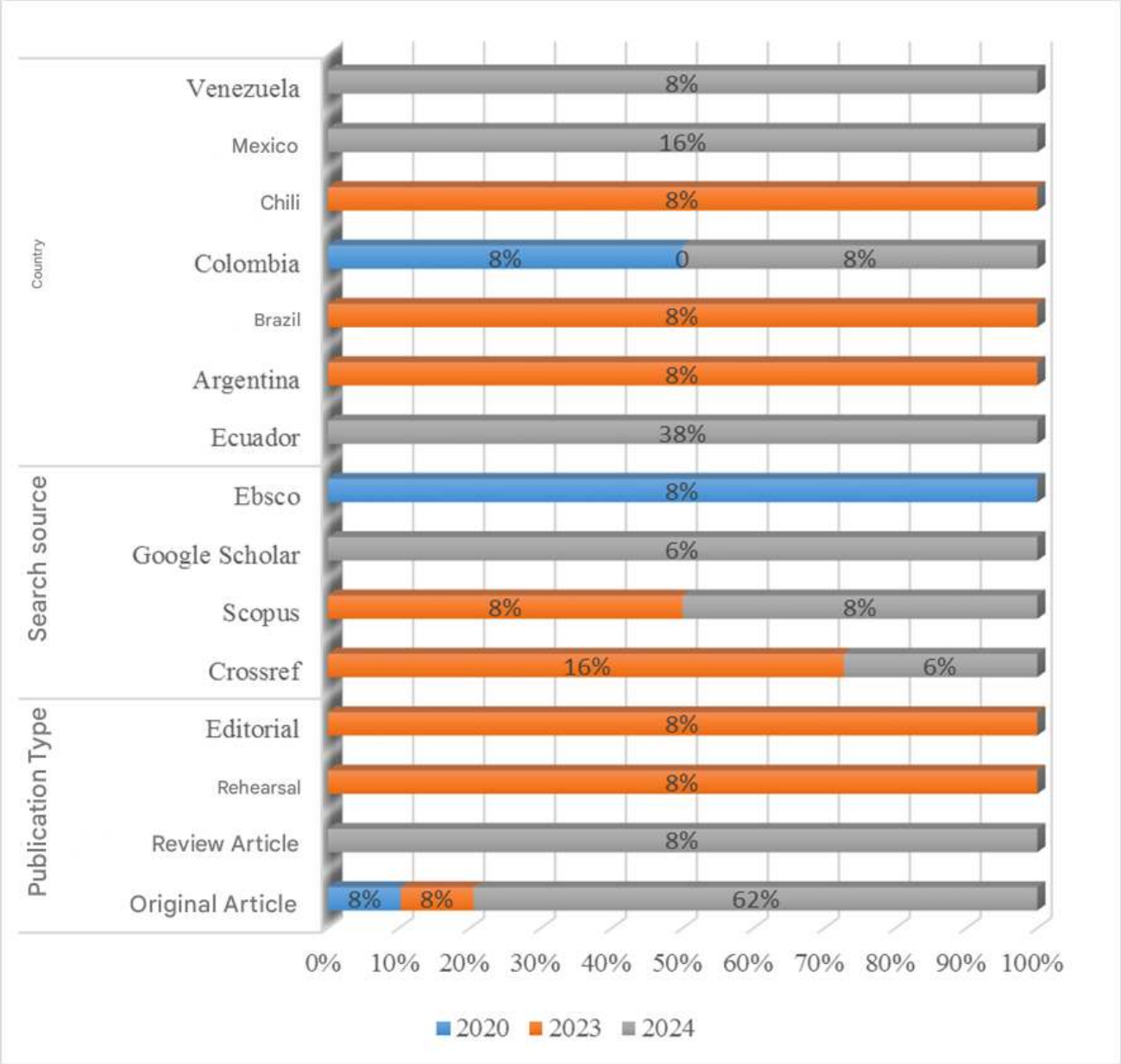
Figure 2 shows a record of publications collected in 2020, 2023, and 2024; these were organized by type of publication, 8% were original articles registered in 2020 and 2023; while, in 2024 the percentage of this type of item increased to 62%. With regard to review articles, 8% were registered in 2024; while, essay and editorial 8% respectively were collected in 2023. It is evident that the type of unpublished publication had the greatest research impact in the aforementioned years.

As for search sources, in 2020 8% of the articles were from Ebsco and in 2023 and 2024 8% of the publications were located in Scopus. In 2023, 16% of publications were linked to and located through Crossref; while, for the year 2024 the percentage was 6%; likewise, this year 6% of publications were located in Google Scholar. It should be noted that Scopus is a database of high recognition worldwide for its bibliometric analysis capacity that no other database has. On the other hand, Crossref through its search platform accessed pages of the publisher where a large percentage of publications were found for analysis.

It is also important to mention that of the publications that were analyzed in 2020, 8% were made in Colombia; for the year 2023, Colombia repeats with 8%, as well as Chile, Brazil and Argentina; finally, by 2024, publications focused on 38% in Ecuador, 16% in Mexico, 8% in Colombia and 8% in Venezuela. These results show that the scientific community of countries such as Ecuador and Mexico have contributed to the arduous task

of publishing topics that contribute to the scientific literature that responds to the challenges of AI in the process of scientific research and publication.

Figure 2. *Publications collected by year*



DISCUSSION

Considering the current scenario, the key challenges associated with the use of AI in scientific research and publication in Latin America are highlighted. From this perspective in Ecuador, AI becomes a valuable tool in the educational field; however, educators are against its use in research due to the lack of familiarity with the tools and it is believed that its use is unethical, it would not hurt to examine the evolution of AI in education in general, especially for easier data processing of the results of the analysis and review of the literature (Acosta & Andrade, 2024).

Therefore, those Ecuadorian scholars of AI are opposed to this research perspective, who in their findings show that educators do agree to implement AI, to improve scientific productivity used effectively when information is managed, for this, digital literacy programs are suggested that will allow recognizing its valuable contributions in research processes. because it can generate high-quality academic writing, but not everything is easy, continuous adaptation to technological advances is necessary, because detecting work generated by AI is a great challenge for university educators, ethical considerations are crucial in the application of AI (Suárez & Suárez, 2024; Juca-Maldonado, 2024; Ruiz, 2024; Vimos-Buenaño et al., 2024).

Other authors who are constantly investigating scientific production with AI are Mexicans, recognizing that there is a lack of bibliometric studies in Mexico that highlight the growth of scientific production through AI, despite the fact that this country has a relevant position in the research field (Sued, 2024). In this country, efforts are made to identify the dissatisfactions of doctoral students in education, in order to award scholarships to those with diverse academic backgrounds and experience in the use of digital resources. This responds to the importance of a continuous flow of research that reveals the incorporation of AI in the educational field. Likewise, the application of AI, specifically ChatGPT, is positively valued among students (Torres-Gómez, 2024).

In Colombia, the scientific literature on AI in education is analyzed, in order to identify knowledge gaps and those sectors of research that require attention, the integration of AI refers to new educational opportunities and challenges , being bibliometric studies those that help to identify trends and gaps in the research and publication of scientific and academic literatures (Mena-Guacas et al., 2024). Likewise, the analysis of bibliometric indicators for scientific publications is essential to fill knowledge gaps; in addition, AI is a multidisciplinary tool that can be applied in various processes, not only educational, but also administrative, since there is great interest in the implementation of this tool for the development of public policies, since big data is an analysis-assisted technique to process and explore large volumes of information (Sánchez-Céspedes et al., 2020).

In this field of knowledge, Chile seeks to explore the applications of AI in scientific research and address ethical considerations in its use, it is necessary for effective governance that can significantly automate and optimize research processes; always with AI we must be cautious, the risks include data privacy, biases and environmental impacts, which include prejudices and concerns about privacy, its implementation must be done responsibly and ethically in scientific research (Suazo, 2023).

Against this backdrop, in Argentina emphasis is placed on the responsible use of AI, considered essential to avoid bias, where AI improves research and education, but cannot replace human creativity, hence collaboration between researchers and AI improves the efficiency and results of research (Cedeño, 2023). In Venezuela, research has been carried out that allows us to reflect on the critical evaluation of data and documents, by promoting collaboration and interrelation between studies, where valid data are essential for the construction of scientific products (Vásquez & Mendoza, 2024).

In several Latin American countries, specifically in Brazil, the use of chatGPT in research and scientific writing and its tensions with integrity requirements in the co-authorship of scientific work have been debated, because most traditional international disciplinary guidelines for scientific integrity do not recognize them as such, resulting in errors and plagiarism for the main authors; however, they need to declare their use in article writing and other research phases to maintain transparency and integrity; since AI can represent risks; so it is essential that authors, reviewers, and editors are cautious, and adopt clear policies on their use in research and scientific publication (Torres-Gómez, 2024).

The fact that most of the articles are original is considered a strength in this study, which allows increasing efficiency in the writing and review of scientific publications. However, in Latin America, where socioeconomic and technological contexts vary significantly, the challenges to integrating these technologies are more marked. Understanding the specific challenges will allow policymakers, academic institutions, and scientific communities to develop strategies to overcome barriers and capitalize on the benefits of using AI. On the other hand, a systematic review can provide a solid basis for future research and foster regional collaborations around the topic.

The limitations of this study focus on specifically addressing the challenges faced by Latin America, this region presents unique characteristics, such as limitations in technological infrastructure, inequalities in access to education, and differences in science and technology policies, which require a detailed and contextualized analysis.

CONCLUSION

This study highlighted the importance of addressing these AI-related challenges in Latin America to refine our research systems in the region. In doing so, we stand for science that is inclusive, ethical, and based on the best available technology. The challenges specifically addressed include resistance to the use of AI due to lack of

knowledge and ethical concerns, as well as the need for digital literacy programs for information management and more efficient scientific production.

In addition, it is necessary to mention the importance of the ethical aspect in terms of the implementation of AI to guarantee the quality and integrity of knowledge, since the arrival of AI radically changed the way research and publications are managed, by allowing a procedure consisting of multiple steps to be carried out efficiently and with an additional level of certainty. Its implementation has also been questioned in the face of biased algorithms and the invasion of subjects' privacy.

The study also raised the current need for regional collaborations and the future development of strategies to overcome barriers and take advantage of AI opportunities. In addition, scientific innovation is fostered through a solid base of literatures for the future of R+D, where knowledge and experience are elements that benefit Latin American countries by breaking down barriers to enter the world of research.

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