

GENERATIVE ARTIFICIAL INTELLIGENCE AND ACADEMIC WRITING: THE USE OF CHATGPT

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1. INTRODUCTION

Writing contributes to the development of the human being in different aspects, such as communication skills, idea organization, better understanding of contexts and, consequently, in the ability to analyze, as well as the development of creativity and cognition, improvement of memory use, and representation of a certain reality (Marcuschi, 2008; Aquino & Silva Junior, 2012).

The production and dissemination of scientific knowledge is closely dependent on academic writing (Motta-Roth & Hendges, 2010). Writing is a problematic, emotional, and complex process (Rahimi & Zhang, 2018), as well as arduous and time-consuming (Rossoni & ChatGPT, 2022), especially in the planning, structuring, and organizing of ideas phases. The use of Generative Artificial Intelligence (GAI) technologies is becoming increasingly common in the academic area, assisting in the writing process, automating some of these activities, making the research and writing process more dynamic and accessible to more people. Among these technologies are language models trained like ChatGPT, which can positively impact academic writing, especially in tasks such as summarization generation, citation formatting, grammatical correction, and even the writing of complete scientific articles. It can also be used to analyze and evaluate the quality of academic writing, streamlining editorial and scientific work review processes.

However, although artificial intelligence brings benefits to writing, it is important to emphasize that this technology should not be seen as a substitute for creative and critical academic writing. The relationship between GAI and writing deserves attention from the academic community both for the current nature of the subject and for the impacts it can generate in its various processes, including in the creation of knowledge itself.

From these perspectives, concerns arise such as the possibility of decreasing the quality of academic texts produced, not by the depth of the topics, but by the element of creativity and inspiration, which are inherent to human beings. It is then considered necessary to understand all its possibilities and potentialities in order to, from now on, project, in a more accurate way, the use of these resources for the generation of knowledge. Moreover, the use of GAI in academic writing can also have ethical and social implications that need to be considered and discussed.

Given the above, the purpose of this article is to analyze the relationship between academic writing and generative artificial intelligence, taking into account the perceptions of potential users of language models like ChatGPT, in order to explore the benefits and challenges of its use in academic writing.

2. THEORETICAL BACKGROUND

2.1. Artificial Intelligence and ChatGPT

Intelligence is the capacity of a person to learn, deal with new challenges, perceive, process information, transform it into knowledge, and use it to control the environment around them. This capacity involves various processes such as memory, reasoning, problem-solving, learning, and goal-directed action (Paschen, Kietzmann & Kietzmann, 2019). Artificial Intelligence (AI), on the other hand, is based on the idea that human minds and machines have

the ability to operate with encoded knowledge to make decisions (Russell & Norvig, 2016). AI is capable of mimicking human cognitive tasks and acting as an intelligent agent, taking actions based on its understanding of the environment through deep, supervised, and automated learning (Russell and Norvig, 2016; Ricardo, Vázquez, Palacios, & Ojeda., 2021). It is a field of computer science that seeks to develop techniques and algorithms that enable machines to perform tasks that typically require human intelligence (Ricardo et al., 2021).

The historical genesis of AI dates back to the 1950s, with Alan Turing, John McCarthy, and other scientists as its main exponents. At that time, the issues were more focused on philosophical aspects (Tanveer, Hassan, & Bhaumik, 2020).

Turing, in his article "Computing Machinery and Intelligence," poses the question: "Can machines think?" He argues that this question is too meaningless to deserve discussion but believes that by the end of the century, public opinion will have changed so much that it will be possible to speak of thinking machines without expecting to be contradicted. In this article, Turing applies a Test, which bears his name, used to determine whether a machine can be considered intelligent or not (Turing, 1950). This test is considered a milestone in the history of AI and continues to be an important topic of discussion and debate to this day.

The evolution of machine learning algorithms and the availability of large datasets have enabled significant advancements in AI, especially in areas such as natural language processing and image recognition. AI has also been successfully applied in various fields such as healthcare, finance, transportation, and gaming, among others (Aggarwall & Kumar, 2018). An example of this evolution is ChatGPT, which is a language model developed by OpenAI that uses advanced machine learning techniques to generate text in natural language very close to human language (Boa Sorte et al., 2021). Generative AI can improve the efficiency and accuracy of various processes, such as decision making, task automation, and data analysis. However, ChatGPT also has significant limitations. As it was trained on large datasets of text from the internet, it may reflect existing social inequalities and reproduce errors and biases present in the data it was trained on to generate certain text.

2.2. Academic Writing and the Use of ChatGPT

ChatGPT is a language model that utilizes advanced machine learning techniques to produce human-like texts (OpenAI, 2023). Its potential has prompted the academic community to explore proper and productive ways of utilizing such resources (Martín-Marchante, 2022). While ChatGPT has room for improvement, such as increased storage capacity and enhancements in natural language generation and understanding, it offers valuable support in various academic processes (OpenAI, 2023). However, it is crucial to consider its limitations, as the current text production by ChatGPT tends to provide generalized and shallow information, lacking depth and specificity.

The construction of text by ChatGPT can aid in organizing and refining information in academic texts, but it should not be mistaken for generating new knowledge (Graham, 2021). When employing ChatGPT in academia, attention must be paid to the risks of plagiarism and loss of originality (Graham, 2021). Authorship plays a fundamental role in academic writing, encompassing credit attribution and responsibility for the information presented (Alves & Moura, 2017). The use of language models like ChatGPT has raised questions regarding authorship and responsibility, necessitating mechanisms to ensure proper attribution and prevent academic fraud and copyright infringement (Alves & Moura, 2017).

To address the ethical implications and maintain authorship and responsibility in academic writing with AI tools like ChatGPT, a possible solution is to reference the tool as a co-author, explicitly acknowledging its use and providing details on how it was employed (Rossini, 2022; Zhavoronkov, 2022). Recognizing the limitations of language models and

establishing clear guidelines for their usage will contribute to ethical writing practices and prevent ambiguity regarding authorship (Zhavoronkov, 2022). While language models like ChatGPT offer advantages in automating text generation, their use must be accompanied by careful consideration of ethical concerns and the appropriate recognition of their contribution (Martín-Marchante, 2022).

3. METHODOLOGICAL PROCEDURES

This article is characterized as exploratory and descriptive, with a qualitative approach. The focus of this type of research is on the subjective interpretation of reality, aimed at understanding the context as a whole, from the perspective of the participants involved in the study (Creswell & Poth, 2018).

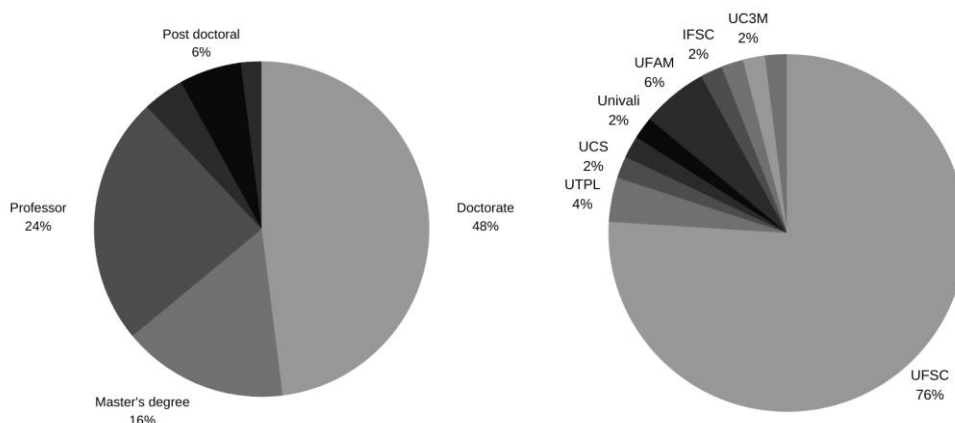
The operationalization of the research took place through the use of strategies to collect and interpret information using different conceptions about the respondents' perceptions about the use of ChatGPT in academic writing, based on the method used by Pereira, Ribeiro, Reis and Santos (2022).

In the data collection phase, two techniques were used, developed successively. The first consisted of a narrative literature review with a systematic search in the scientific databases Scopus, Web of Science, IEEE Explorer, Springerlink, Scielo, and Science Direct, without temporal delimitation, among articles and reviews published in English and Portuguese, using the string ("Artificial Intelligence" OR "machine learning" OR "chatgpt" OR "gpt*") AND "academic writing", filtering by title, abstract, and keywords.

The literature search was followed by a data collection stage through asynchronous interviews, through an online questionnaire (Google Forms®). The questions were based on a script, which is presented as an appendix to the study. This data collection strategy is consistent with the suggestions of Merriam and Tisdell (2016) that online interviews can be conducted both synchronously (using tools such as Skype®, CMC®, Adobe Connect® and platforms such as Zoom®, MS Teams® and Googlemeet®) and asynchronously, when there is a lapse of time, by email, online discussion groups, or online questionnaires, as used in this work.

The questionnaires were shared through the Internet and instant messaging groups (WhatsApp®), reaching 48 respondents from seven higher education institutions in Brazil (UFSC, IFSC, UFAM, Univali, UCS), Ecuador (UTPL), and Spain (UC3M), from various post-graduate programs and diverse profiles, as shown in Figure 01. Each respondent was assigned a code that identified them from R1 to R48.

Figure 01 - Respondent Profile



Source: research data (2023)

In order to analyze the collected data, the qualitative content analysis technique (Mayring, 2014) was used. This technique allows combining the positive aspects of discovering "natural" categories of grounded theory (Corbin & Strauss, 2015) with content analysis strategies (Krippendorff, 2013). Its aim is to achieve a systematic qualitative interpretation of the text and uses descriptive analyses to complement qualitative analyses, such as relative frequency and personal frequency. The results of the data discussions, collections, and analysis will be organized and presented in the following section.

4. ANALYSIS OF RESULTS AND DISCUSSION

The advent of ChatGPT raises questions about the future of academic research, especially the writing process resulting from it (Stoke-Walker, 2023). To address these concerns, it is necessary to understand both the potential and challenges of this technology (Zhai, 2022), so as to understand how AI can affect scientific production, in this process of knowledge construction, providing the academic community with the most appropriate way to take advantage of this new reality.

In this sense, from a theoretical framework resulting from a systematic literature review and data collected through interviews with members of various higher education institutions in Latin America and Spain, four categories of analysis were defined which raise questions about the complementarity of ChatGPT in the writing process; the ethical and social questions of its use in an academic context; the limitations of ChatGPT in relation to the elaboration of academic texts and the questions of intellectual property and creativity, which will be better detailed in the following sub-sections.

4.1. ChatGPT as a Complementary Tool for Academic Writing

ChatGPT is capable of answering follow-up questions, acknowledging mistakes, challenging incorrect premises, and rejecting inappropriate queries (Zhai, 2022). When asked if it believes that generative AI should be viewed as a replacement for creative and critical academic writing or as a complementary tool, it gives the following response: "I am an artificial intelligence trained by OpenAI and I do not have personal opinions. However, my function is to provide information and answers based on data and knowledge" (OpenAI, 2023). In the same prompt, it goes on to answer that: "in general, the opinion of the academic community is that artificial intelligence should not be seen as a replacement for creative and critical academic writing, but rather as a complementary tool".

This view from the tool itself was reflected in the data collected, both in the literature review stage and in the asynchronous interviews. In other words, with regard to the possibility that generative AI replaces humans in academic writing, the majority view is that generative AI is a complementary tool to support the researcher in the academic writing process.

This support can be given in different ways and degrees. Those that understand a consistent type of support are identified, such as the structuring and presentation of knowledge on certain topics, "favoring the interpretation and reflective approach of humans" (R25). However, most people understand that the help is, at least currently, in more basic and automatic activities that take time, such as grammar correction, translation, adaptation of text structure (standards and formats), and other repetitive activities.

When asked specifically how the tool would help authors in the academic writing process, the answers were related to these same basic elements, considering, in addition to the previously mentioned, "data mining" (R. 33), reference and source consultation, "identification of authors working on the same topics" (R. 28), "agility in the search for theoretical foundation" (R. 42), "learning tool" (R. 33), more comprehensive research, considering future possible

access to scientific databases, initial analyses with data cross-referencing, comparison of styles and more. "The help will be "in the same way as a traditional library. Of course, tools of this magnitude (AI) bring greater surprise by their speed and reach" (R41). It is also important to highlight the help for people who have difficulty developing or organizing ideas and thoughts while writing. The ChatGPT, then, could be useful for relating and ordering topics in the text construction. "AI is an excellent substitute for the role of writer, but not for the researcher" (R39).

The perceptions of the interviewees are reflected in the literature reviewed in the first stage of data collection. These studies corroborate, at this time, the use of this technology as a complementary means for correcting texts in general, suggesting improvements in style and writing, adaptation to standards and formatting styles, and more (Martín-Marchante, 2022; Boa Sorte et al., 2021, Graham, 2021, Tanveer, Hassan & Bhaumik, 2020).

The aspect of the possibility of translation also appears as an important resource: "For non-native English-speaking countries, generative AI is essential, whether for translating texts or for assisting in building texts in that language" (R47).

Only three answers provide a resounding negative, understanding that generative AI cannot replace academic writing. They consider that its resources are too limited to offer significant support.

On the other hand, a pragmatic perspective of limitation or inability for generative AI to surpass human intelligence was observed, especially in the data collected from the interviewees. For creation and the generation of new knowledge, there is a dependence on the being that knows and perceives through the senses and processes this experience, establishing relationships with previous elements resulting from human cognition. Novelty, disruptive research and discussions depend precisely on this new human perspective on life; "AI will hardly have the ability to make [such an evaluation] alone without human analysis" (R6). In this same sense, "the support of AI is important, but there are still limitations and issues that it does not know how to deal with, for example, "how could [an AI] translate the human experience of a trip?" (R38).

The construction of a text by a human being is at the same time a process that depends on the ability to create, but also generates creative responses (Marcuschi, 2008; Aquino & Silva Junior, 2012). It is considered a characteristic trait of human beings and should be considered as a perspective in the discussion about the creative ability of the machine. When ChatGPT is asked to write a Haikai-style poem about a certain topic, the return is something new.

As already specified, ChatGPT is a specialized generative language AI model and is currently the most sophisticated available to the general public. It is a resource that answers, elaborates texts, and improves with use, learning from its users. It uses previously determined bases and produces texts with a certain fluency and coherence.

The great challenge is to be able to simulate human perception in writing, such as the "journey" or the excitement in front of a novelty and discovery of elements that are proper to social interaction and the cognitive ability of the human being.

When asked about how an artificial intelligence could translate a person's perception of a fantastic or catastrophic event, ChatGPT responds as follows: "An artificial intelligence can translate a person's perception of a fantastic or catastrophic event using natural language processing (NLP) and sentiment analysis techniques. It can analyze the person's text or speech and identify keywords and patterns that indicate emotions, such as fear, sadness, surprise, etc. The AI can also consider other factors, such as the person's context and tone, to determine their perception of the event. However, it is important to remember that the AI's ability to understand human perception is limited and there may be cases where its evaluations are not accurate." (OpenAI, 2023).

To continue this reflection, the interviewees were prompted to advance their considerations on the support provided by ChatGPT, specifically with regard to reviewing scientific papers. The results point to three types of responses: basic instrumental use, use that seeks underlying correlations, and finally, a pragmatic perception based on the limitations of the technology, but in no way denying its possibilities.

With regard to the first group, the responses relate to basic or instrumental use, such as support in detecting plagiarism, translation, review and reference organization, spelling corrections, form issues, assistance in writing texts on the aspect of cohesion and coherence, all elements that glimpse the agility of the process in some review steps.

One group of responses advances on the experience of what this support from the generative AI could be in the review process of scientific papers. They consider that it could help in contextual review of the texts produced by a given author, where one could search for the complete references of the author's complete body of work. Another possibility is the identification of the quantity and location of certain themes, related authors, and their positions in the propositions they make. At this point, "the agility in both searching for content and contexts of a particular subject is what most impacts the use of the tool" (R10). The benefit is in the location and organization of background themes, generating consistent inputs so that the researcher, the writer has alternatives that complement their perspective in building their thinking. And also, "if she [the AI] does the base, the researcher will be much more in the differential that they can contribute with their research" (R11).

Depending on its constitution, access to knowledge bases, and how it evolves, generative AI can help researchers and reviewers identify what is relevant and potential elements that can be complemented in the work, enriching the text. In the same way, it can be considered that generative AI identifies (or will identify) incorrect elements in different works at the same time, improving not only the review process itself but also contributing to the development of a strong and impactful science. There is no doubt that generative AI can be used as a feedback tool for researchers as part of the editorial review process (Thelwall, 2022).

As the final part of the evaluation of using ChatGPT as a support in scientific paper review, the perspectives that observe the limitations of the tool and the need for human intervention are presented. According to this approach, in the current version of ChatGPT, content analysis is compromised considering the limitations experienced; "... the repeated use of a particular process in a scenario can saturate the research, turning the production into rhetoric, [because] where is the dialectical process? the antithesis within this instrument?" (R10).

Although technology helps in reviewing and writing texts, there remains a concern that the author's original idea is maintained, that the given meaning is what remains after a process or automated evaluation actions. When consulting ChatGPT on whether an artificial intelligence can perform a dialectical process, the answer received was: "Yes, an artificial intelligence (AI) can be programmed to perform a dialectical process. AI can be used to simulate dialectical thinking, seeking to understand and solve problems through data analysis and generating new hypotheses. However, AI is still far from having the ability to understand human nature and the complexity of society and history, as the dialectical process originally aimed to understand. Additionally, AI depends on programming and training received, which means its ability to perform a dialectical process will be limited by the knowledge and perspective of its creators" (OpenAI, 2023).

Although there are reservations about using ChatGPT for academic writing, the responses signal positively and positively its incorporation into this process. It is an important complementary resource, surpassing the superficiality of orthographic review, and can advance to deeper issues that help researchers in the construction of their texts. They can assist in faster identification of concepts, contexts, and relationships between authors and themes, giving a

more directed research path (Martín-Marchante, 2022; Thelwall, 2022; Boa Sorte et al., 2021, Graham, 2021, Tanveer, Hassan & Bhaumik, 2020).

4.2. Ethical and Social Implications of Using ChatGPT in Academic Writing

ChatGPT was made public in November 2022, and two months later, it had reached 100 million users, a record; other platforms took much longer to gather this number of subscribers. This achievement is indicative of the extraordinary interest in ChatGPT and the benefits it will bring to various human activities, including academic ones. However, one must consider the reflexive aspects that this technology could cause, especially the ethical and social implications of its use; among them: issues of authorship, plagiarism, academic fraud, responsibility, transparency, fair credit, regulation, quality control, diversity and inclusion.

At least two questions arise when considering the use of ChatGPT in academic work: will it be possible to consider ChatGPT as a co-author of this work? How are writings generated by these language models credited? The issue of authorship is one of the main ethical concerns related to academic writing and the use of language models like ChatGPT. Authorship is the act of creating and being recognized as the creator of a work (Ricardo et al, 2021). When it comes to academic writing generated by language models, there are concerns about who should be credited as the author of that work and what are the ethical and legal implications.

Despite this controversy, some studies already bring ChatGPT as a co-author (ChatGPT & Rossoni, 2022; ChatGPT & Zhavoronkov, 2022; O'Connor, S., & ChatGPT, 2023). There are divergent positions, however, that consider the language model does not meet the requirements to be characterized as an author of a particular scientific study, as it cannot take responsibility for the content and integrity of these scientific publications. These same critics, however, say that the contribution of the generative AI, to write articles, can be recognized in other sections of the study besides the list of authors.

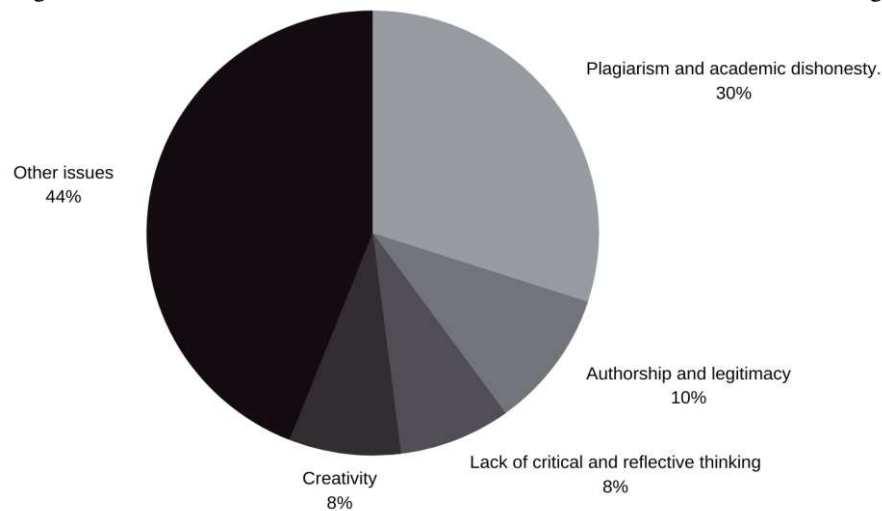
The controversy regarding the attribution of authorship to ChatGPT leads to another ethical question, considering that the texts generated by the generative AI could be giving rise to a new type of plagiarism, called "technology-facilitated plagiarism". This issue was reflected in the data collected from respondents who considered it the main ethical issue to consider when using the language model, as demonstrated in figure 02.

Despite their texts passing unscathed through conventional detectors, generative AI is being developed to allow verification of texts generated by natural language processing models, such as GPT Zero, developed by Edward Tian of Princeton University (USA). The argument that writings generated by language models can be considered as plagiarism lies in the fact that they are not created by the human author. This concern reaches a higher degree when considering that these texts are used to defraud academic works such as theses and dissertations.

This can lead to legal and ethical problems, such as the loss of credibility of the academic institution and the devaluation of the scientific knowledge produced and academic writing generated by language models. (OpenAI, 2023)

To address these ethical issues related to authorship, it is important to establish clear standards and regulations for the use of language models in academic writing. In addition, it is important to ensure that writings generated by language models are credited fairly and transparently, and that measures are taken to prevent academic fraud and violation of copyright.

Figure 02 - Main ethical issues related to the use of ChatGPT in academic writing



Source: Research data (2023)

ChatGPT (OpenAI, 2023) was consulted on how to solve these issues related to this new type of plagiarism and legitimacy in academic writing, in order to ensure that writings generated by language models are credited fairly and transparently, and that measures are taken to prevent academic fraud and violation of copyright, listing the following solutions: a) transparency: it is important to be transparent about the use of language models in academic writing, clearly indicating when a writing was generated by a language model. This allows readers to understand and properly evaluate the origin of the writing; b) fair credit: it is important to credit writings generated by language models fairly and transparently, crediting the human author, the language model, and who trained the model; c) standards and regulations: it is important to establish clear standards and regulations for the use of language models in academic writing, including regulations to ensure that academic fraud and violation of copyright are avoided; d) quality control: it is important to establish quality control processes to ensure the quality and validity of writings generated by language models. This includes peer review and evaluation by experts in the field; e) education: it is important to educate users on the correct and ethical use of language models in academic writing, teaching them about the ethical and legal implications involved and how to avoid problems such as plagiarism and academic fraud (OpenAI, 2023).

These suggestions are not exhaustive, but they are some of the main ways to ensure that writings generated by language models are credited fairly and transparently, and that measures are taken to prevent academic fraud and copyright infringement. It is important to remember that these ethical issues are complex and that a multidisciplinary approach is necessary to solve them.

Additional concerns were reflected in the collected data, such as "the marginalization of academic studies and the devaluation of the researcher who will be compromised, due to the lack of trust and transparency in conducting these scientific researches" (R2); the generation of texts and (re)production of biased and mistaken studies (R21); the absence of depth and creation of new knowledge (R16); lack of academic commitment (R19); diffusion of concepts of non-scientific interests (R21); removal of sensitivity and deep critical thinking from scientific work (R28); shallow and non-human knowledge generation (R28). More emphatic considerations indicate that the use of ChatGPT in academic writing will be: "an insult to those who really try and give part of their lives contributing to academic writings" (R28). This statement can be countered by another that indicates that the use of ChatGPT and other generative AIs in the academic arena is a matter of values, because "if the researcher is of bad character and

incompetent, he will pay someone to research for him, whether it be a machine, a colleague, or a scientific production site (R39).

The issues related to diversity and inclusion were also considered in this work, especially if the use of AI in academic work could serve as an inclusive and supportive factor for diversity. One of the points that reflects this new perspective was highlighted by one of the research participants, in these terms: "the use of ChatGPT will contribute to reducing the digital divide [...] this is worth noting. Digital tools can be at the service of humanity, the common good, and not just a privileged group" (R15). The results suggest that the use of ChatGPT can be beneficial in increasing inclusion and diversity in academic writing and this can be achieved in the following way: 1) Reviewing and translating texts; 2) Offering a more accessible language for people with linguistic limitations; 3) Providing interdisciplinary information for researchers, and 4) contributing to idea formation and writing structure.

In addition, generative AI can be a useful tool for minority groups, including people with disabilities, LGBTQ+ individuals, people from different ethnic groups, the elderly, among others; people who have difficulty communicating their research results, as well as people with limited access to basic education and quality learning about formal writing.

To address these ethical issues related to diversity and inclusion, it is important to establish clear standards and regulations for the use of language models in academic writing and ensure that writings generated by language models are fairly and transparently evaluated and credited. Furthermore, it is important to promote education and awareness about the importance of diversity and inclusion and their relationship with academic writing generated by language models. It is also important to encourage the academic and scientific community to discuss and develop solutions to ethical and social issues related to diversity and inclusion and to have public policies that facilitate access and use of AI for all segments of society (OpenAI, 2023).

When questioned about the issues of inclusion and diversity and how they could be facilitated by generative AI, ChatGPT pointed out the following suggestions: a) use a variety of data sources to train language models, including sources that represent and include minority and marginalized groups; b) regularly check training data to identify and remove biases; c) use debiasing techniques to mitigate bias present in training data; d) implement verification mechanisms to ensure representation and inclusion in writing generated by language models; and e) promote diversity and inclusion in the language model development team, including hiring individuals from different social and cultural groups.

It is also important to consider that diversity and inclusion are complex issues and require a multidisciplinary approach to debate and resolve them. Furthermore, it is important to pay attention to technological and social developments and to adapt policies and procedures accordingly. These ethical issues need to be carefully considered and discussed to ensure the integrity and validity of academic writing, ensuring the rights of individuals and communities are protected.

4.3. Limitations of ChatGPT Use in Academic Writing

Although it is very evident to highlight the benefits, from the users' enthusiasm in the field of scientific writing, some limitations can be identified from their experiences. Some believe that the tool is extremely useful for organizing information and generating ideas, while others highlight the lack of adequate scientific data and the non-generation of knowledge in individuals as limitations. In turn, there are those who consider that the writing produced by ChatGPT still does not approach human performance, but can be a useful tool for generating ideas. Others highlight the need for corrections for conversion to Brazilian Portuguese, as the tool is parameterized for Portuguese from Portugal. There are also statements that the too-

perfect writing generated by generative AI can distance the individuality and art of human writing. There is a majority conformation regarding the quality of the writing generated by ChatGPT, with sentence formatting and clarity (Martín-Marchante, 2022; Boa Sorte et al., 2021, Graham, 2021, Tanveer, Hassan & Bhaumik, 2020), although the vocabulary may be considered simple or complex, depending on the comparison, especially by the initial perception that the tool has many "academic jargons" that generate superficial content.

In regards to academic writing, the main limitation, and with a great impact for researchers, is the limited access to scientific knowledge bases (such as Scopus/Web of Science), as well as faults in the referencing of scientific works. Also, the data fed into the tool has a temporal limitation, as it is temporarily restricted to the year 2021 (Boa Sorte et al., 2021).

Regarding the quality of writing itself, there is a contrary alignment to the use of technology. Although it is written clearly, fluidly, and cohesively, there is a persistent repetition of words, which makes the text, in general, poor and without personality. "It is a writing based on other texts, in the sense of the repetition of ideas, not contemplating innovative issues." It loses in style, making the writing too cold and without human characteristics, "[...] the art, the inference and the individuality of interpretation do not exist" (R10). And also, "ChatGPT always brings generic texts about the topic. [...] it is a product of the knowledge corpus of the area used in its training" (R39).

The construction of a text, as previously seen, is composed of various elements, among which are style, structure, linguistic formal elements, etc. (Aquino & Silva Júnior, 2012; Marcuschi, 2008). But it also depends on social interaction and the complexity of the relationship between people for the production of meaning (Koch, 2003). A great cognitive effort is required, which searches for information and knowledge specific to each person for the production of the new and the subjectivity with which human relationships are recognized. In this sense, Motta-Roth and Hedges (2010) consider that the text presented by the researcher is a product of other, more complex, processes, such as constructing arguments from specialized reading and experimentation, observation, and experience, in addition to considering the interaction between people within contexts.

Finally, it is important to point out the limitation that sometimes different answers are returned to the same questions, which generates instability and distrust.

4.4. ChatGPT, intellectual property and creativity in academic writing

Intellectual property is one of the main ethical concerns related to academic writing and the use of language models like ChatGPT. Both in literature, which still does not have complete solutions (Voitovych et al. 2021, Ricardo et al. 2021; Alves & Moura, 2017), and in the responses to the questionnaire, this is an item that generates discomfort and concern.

Intellectual property is the set of legal rights that protect intellectual creations, such as literary, artistic and scientific works (Ricardo et al., 2021). When it comes to academic writing generated by language models, there are concerns about how these creations are protected by copyright and what are the ethical and legal implications of this.

ChatGPT does not properly create ideas. It feeds on a set of previous data and information to present answers - with fluency, coherence and similarity to human texts, to the questions asked. However, this does not mean the creation of new knowledge. Knowledge is not generated by the machine, but by humans before this (Zhavoronkov, 2022; Voitovych et al., 2021; Ricardo et al., 2021).

The same goes for the considerations of the majority of the respondents, who consider that AI cannot be held responsible for produced texts, as the machine "is not endowed with consciousness and cannot assume responsibility for the work produced" (R1). Authorship and intellectual property are crucial in academic writing, both for accountability for the content and

for recognition of authorship (economic and/or social). The authorship of an academic publication considers the effective and ethical participation of people at different moments of the research, and that is why it is important to understand the impact of this performance on the elaboration of a scientific text (Smislaert & Jalonen, 2018).

In this sense, "the authorship, intellectual property, and responsibility for the text generated by AI should belong to the researchers who used it" (R1). To ensure a transparent process, users of ChatGPT and other AIs must explicitly state the use of these resources, as well as the questions asked and their sources indicated (Rossini, 2022). In this sense, "If ChatGPT generated most of the text, this should be indicated somewhere. [...] In the same way we use already published works, the text from the generative AI can be used as support, but not as the final text" (R43). There are authors who understand that ChatGPT should be listed as a co-author (Rossini, 2022; Zhavoronkov, 2022), however, this point does not have a majority position in the studies conducted. There is another perspective that considers that: "AI should be included as a co-author without gains and property [...] and that copyright rights and their economic correlations will need to be reviewed over time" (R37).

Although the academic community and the general community are becoming familiar with the use of this resource, the trend that can be identified is that the author of a work that uses ChatGPT should explicitly state this action. Thus, one should seek the best way to take advantage of this resource or collaboration in academic writing aiming for the recognition and effective participation of each person and the resources used.

An additional concern highlighted in the responses of experts is the doubts regarding the real sources used by ChatGPT and, tied to this, the fact that many references presented do not correspond to reality. For a scientific work, rigor on sources is part of its validity and, in general, studies are based on practical or theoretical constructions already developed by other researchers. Proper referencing is therefore part of the work and not an option.

To deal with these ethical issues related to intellectual property, it is important to establish clear standards and regulations for the use of language models in academic writing and ensure that these writings are protected by copyrights in a fair and transparent manner (Voitovych et al. 2021, Ricardo et al. 2021). Texts generated by resources such as ChatGPT should be used with permission and proper credit, and measures should be taken to prevent copyright infringement and unauthorized commercialization. Alternatives such as licensing agreements between the companies behind these technologies and users can be considered, always keeping in mind free access to science for the inclusive development of nations. Other identified solutions could include the inclusion of security mechanisms to prevent unauthorized use, such as digital or tracking marking systems, or the establishment of clear standards and regulations for the commercialization of texts, which could represent a limitation of access to knowledge generation. Another possible action, and the most important one, is to promote education and awareness about intellectual property and copyright issues (Voitovych et al., 2021; Ricardo et al. 2021).

It is important to remember that these ethical issues are complex and that a multidisciplinary approach is necessary to solve them. Additionally, it is important to be aware of constant technological and legal developments and adapt policies and procedures accordingly.

In the same direction, or as a result of the ethical issues of authorship and intellectual property, is the creative capacity. Creativity is the process of creating something new and original and is considered a human characteristic, a very human trait (Berg & Dandolini, 2010; Aquino & Silva Junior, 2012).

On one hand, there are concerns that writings generated by language models may be seen as less creative and original than human writings, which can affect the perception and

value of academic writing. In some way, the automation of text composition may decrease the importance of scientific production.

"The ChatGPT presents today texts without elements of "creativity and sensitivity" proper to human writing" (R28). The texts bring repetitions of words and ideas and, although quite clear, are relatively lacking in elaboration. "The element of creativity or lack thereof is even pointed out as an ethical and social implication of using the ChatGPT" (R24). There is doubt about whether the creativity considered in texts produced by these technologies could be taken as artificial creativity and what value and impact it could have on the results of the studies presented in these texts. And, obviously, the responsibility element returns, since the texts are not written and delivered by human beings and it is not clear at which instance responsibility will be taken for such contents: the user, programmers, company, original sources, databases, etc.

In another sense, some respondents argue that the proper use of these technologies can enhance human creativity by providing base information, contrasting or locating contradictory positions, and expanding the possibilities of discussion. It can also help researchers and inexperienced writers structure ideas and text models. The ideal, therefore, would be to determine a balanced use of AIs as support in the development of this competence instead of relying exclusively on them.

These ethical questions are complex and require a multidisciplinary approach to be addressed. It is the responsibility of the academic community to continue discussing and developing solutions to ensure that human creativity is valued and protected and that the benefits that these technologies bring can be utilized in the best way possible.

6. CONCLUSIONS

Academic writing is essential for the generation and sharing of knowledge. The use of generative AI, especially ChatGPT, can be an ally in this process. In order to delve deeper into the analysis of issues related to the use of this language model in academic writing, we sought to consider the perceptions of potential ChatGPT users in order to explore the benefits and challenges of its use in writing in the academic field, understanding how generative AI can affect scientific production in this knowledge-building process and how the academic community can properly take advantage of this new reality.

The results indicated that generative AI should be viewed as a complementary tool to creative and critical academic writing. Although it is highly advanced, it still lacks the ability to develop the creativity and sensitivity necessary for human writing. Moreover, there are arguments that writing is a skill that requires constant improvement and that this evolution is only possible through practice and self-awareness, something that generative AI is not yet capable of providing.

On the other hand, ChatGPT can be very useful as a complementary tool, especially with regards to operational and repetitive tasks, such as grammatical correction and revision, or data analysis. This tool can assist in presenting information and knowledge, text structure, organizing ideas and constructing certain sections of the study, as well as contributing to the interpretation and reflective approach to research data.

With regards to the ethical and social implications of using ChatGPT in academic writing, plagiarism and intellectual property issues stand out, such as using the tool to generate complete texts and indicating the human user as the author. Furthermore, there is concern about excessive trust in what the generative AI says without deep discussion of the topics. As for social implications, there is fear of marginalizing academic studies and a loss of researcher recognition. There is also concern that excessive use of the tool may limit critical thinking and favor plagiarism in its new form facilitated by technology. In addition, there is the issue of the

relationship between the perception of scientific and academic knowledge and knowledge acquired by the tool and whether it really builds meaning for the user. Another concern is the copyright and economic-legal issues, as well as the distortion of human perception caused by the use of generative AI. There is also the issue of academic dishonesty and intellectual laziness, as excessive confidence in digital tools can lead to a disregard for the importance of creating new knowledge. In other words, despite the potential of ChatGPT to assist in text revision and help reduce the digital divide, it is necessary to carefully consider its ethical and social implications, so that its use is made responsibly and consciously.

The issues related to intellectual property and authorship in texts generated by ChatGPT deserve attention from the academic community. There is a divergence over whether ChatGPT can be considered the author of the produced texts, since generative AI is not conscious and cannot assume responsibility for the work produced. In this case, and this has been observed in the collected data, the author must clarify the use of ChatGPT, informing to what extent its participation was given in the generated text. This goes hand in hand with arguments indicating that ChatGPT can be a useful tool, as long as it is used responsibly.

Finally, it is important to mention that Turing's reflections can be used as a model for discussions on the social impacts of using ChatGPT and other similar technologies in an academic context. In his essay on the possibility of machines thinking, the author questions whether the question we should ask is whether machines can think, or if the real potential of machines is something else, and if we are looking at peripheral or secondary things. The awe with the question and answer game is possibly a sample of the path we will be taking in the coming years, and the question should not be whether there is agreement or impact, but how scholars, researchers and universities will be participating in these definitions.

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APPENDIX

Below is the script used in the asynchronous interviews conducted with academics and professors in Latin America and Spain.



- 1) Have you used the ChatGPT?
- 2) Have you utilized it as a tool for assistance in academic writing?
- 3) Have you employed the ChatGPT for any of these functions: summarization, reviews, and writing complete scientific articles, concept inquiry, identification of authors related to a certain topic? How did you use the tool?
- 4) Do you believe AI should be seen as a replacement for creative and critical academic writing or as a complementary tool?
- 5) What are the main ethical and social implications of using ChatGPT in academic writing?
- 6) What is your opinion on the use of AI in the review of scientific papers? In what way can AI be used to improve the efficiency of the review process of these papers?
- 7) How do you evaluate the quality of writings generated by ChatGPT compared to human writings? Are there limitations to the use of ChatGPT in academic writing?
- 8) How do you believe AI can be applied to help authors develop their academic writing?
- 9) How do you believe AI can be employed to increase diversity and inclusion in academic writing?
- 10) How do you evaluate intellectual property issues when it comes to writings generated by ChatGPT?