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Using ChatGPT in University Academic Writing: A Bibliometric Review Study on the Implications for Writing Reports, Papers, Essays, and Theses

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Abstract. The use of ChatGPT in university academic writing has generated a growing debate about its implications for the originality, quality, and authenticity of university writing. Its accelerated adoption in the creation of reports, essays, and theses raises serious questions about academic integrity, the possible increase in plagiarism, and the potential decrease in critical writing skills among students. This bibliometric review study analyzes the implications of the use of ChatGPT in university academic writing, covering both bibliometric indicators and a qualitative analysis to identify the areas on which research in this field has been focused. A mixed and descriptive approach is employed, based on 71 manuscripts reviewed and extracted from the Scopus database. The implications of the use of ChatGPT are identified and distributed in three

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areas categorized as “Quality and development of writing skills”, “Academic integrity and ethics in writing”, and “Educational assessment”. Despite the observed benefits, such as improved fluency and grammar, significant concerns remain regarding the over-reliance on ChatGPT and its impact on students’ critical thinking skills. It is therefore concluded that, although ChatGPT can complement certain aspects of academic writing, it is essential for students to strengthen their own writing skills to avoid total dependence on AI support. Furthermore, educational institutions need to establish clear policies and guidelines on the use of ChatGPT to ensure academic integrity. It is also recommended that future studies should evaluate the effectiveness of these policies and explore their impact on the development of critical and creative skills in students.

Keywords: academic writing; bibliometric review; ChatGPT; higher education; implications

1. Introduction

Education 4.0 is seen as an evolution of online and distance education, which stands out for its integration of advanced technologies, including artificial intelligence (AI) (Gibert Delgado et al., 2023). In the last decade, AI has emerged as a cutting-edge field of research, transforming not only sectors of society, such as economics and medicine, but also the field of higher education (Vera-Rubio et al., 2023). As an educational tool, AI leverages machine learning algorithms, natural language processing, and data analysis to augment and personalize learning experiences, facilitating adaptive learning and intelligent tutoring (Delgado et al., 2024). Indeed, AI is seen to be acquiring a solid scientific basis, generating many successful applications in higher education and having important implications for learning and teaching (Vera, 2023). However, it must be highlighted that the implementation of AI in higher education requires careful planning and adequate training for both teachers and students (Salmerón et al., 2023). While AI has been shown to have a positive impact on higher education, there are also challenges and concerns that need to be addressed (Chamorro-Atalaya, Huarcaya-Godoy et al., 2023; Calderón Figueroa et al., 2024). In particular, one of the emerging tools that AI has generated is Generative Artificial Intelligence (Generative Pre-trained Transformer). Since the recent appearance of ChatGPT, it has had a remarkable impact, being quickly adopted by users in the academic environment (Gallent-Torres et al. 2023). Although their potential is still being evaluated, these emerging technologies are expected to significantly improve the teaching and learning experience (Gonzáles et al., 2023).

Focusing on a specific context, the use of AI in academic writing has increased significantly, generating a debate about legitimacy and ethics, though some experts maintain that it facilitates the efficient production of high-quality work (Juca-Maldonado, 2023). Thus, AI has transformed academic writing by combining human creativity with its processing capacity, generating both opportunities and challenges in the educational field in which it is gaining prominence (Román Acosta, 2023). Furthermore, AI tools can assist in various aspects of academic writing, such as generating ideas, conducting research,

organizing content, and improving grammar and syntax (Camino & Clavijo, 2024). Research, as a means of transformation, requires that academic writing reflects the entire process, although recent studies indicate that AI is simplifying the creation of scientific documents for higher education students (Carrillo Cruz et al., 2023). Despite the use of AI, academic writing skills remain poor, suggesting the need to integrate digital tools alongside active methodologies to improve the creation of coherent texts (Santana-Mero, 2023).

Academic writing, which involves the ability to communicate ideas and arguments clearly and coherently, represents a fundamental challenge for students in the field of higher education. Indeed, it is a crucial skill that they must develop throughout their training (Román Acosta et al., 2023). However, the accelerated advance of AI technologies has facilitated the adoption of design approaches in the preparation of academic reports that are less human-centered, involving linguistic models such as ChatGPT (Livberber, 2023). ChatGPT's capabilities include generating coherent text, extracting information, and accessing large amounts of data, all of which present both opportunities and challenges in higher education, highlighting the importance of analyzing their integration (Romero-Rodríguez, 2023). Nevertheless, academic integrity and ethics remain a relevant aspect, suggesting that authorship implies responsibility, which can only be attributed to humans. Thus, the ethical issue poses a challenge with regard to the use of ChatGPT in academic writing (Apolín Montes et al., 2024). ChatGPT offers opportunities in the creation of educational content, but raises concerns about the authorship of texts. While some educational institutions prohibit its use, others employ plagiarism detectors; however, these can be easily circumvented, and there remains an increased risk of wrongful accusations of plagiarism being leveled against students (Sein-Echaluce Lacleta, et al., 2023).

In view of the above, the objective of this study is to analyze and describe the implications of using ChatGPT in university academic writing, focusing on the ways in which this tool affects the quality, originality and authenticity of university writing, such as reports, essays, and theses. Through a bibliometric review, the scientific manuscripts extracted from the Scopus database will be examined, since the emergence of ChatGPT to date; this will allow us to identify the main areas of focus in the scientific literature, as well as the possible gaps or challenges related to the implementation of this tool in higher education. This study seeks to offer a frame of reference for future research that seeks to explore the role of AI in strengthening critical and creative skills in the university context. Therefore, the research questions (RQ) based on the established objective of the study are as follows:

- RQ1: What has been the scientific production on ChatGPT in the first two years since its creation, in terms of document type and source type?
- RQ2: What are the most relevant and prevalent terms on the implications of ChatGPT in academic writing in higher education?
- RQ3: What are the implications of the use of ChatGPT for academic writing in the field of higher education?

2. Methodology

2.1 Research Focus and Scope

This study is framed within a mixed approach, integrating quantitative and qualitative methods to provide a comprehensive understanding of the implications of using ChatGPT in university academic writing. On the quantitative side, by focusing on bibliometric analysis, metrics such as keyword frequencies, keyword co-occurrence analysis, and the identification of thematic clusters will be applied. These quantitative tools will allow for measuring and analyzing the prevailing trends in recent scientific literature. Similarly, the qualitative analysis will focus on the interpretation of the content of the studies included in the bibliometric review, in order to identify the implications resulting from the use of ChatGPT in the academic context.

Since its main objective is to analyze and describe the implications of using ChatGPT in university academic writing, the scope of the study is descriptive. Statistical tools such as the mean and quartile indicators (Q1 and Q3) will be used to identify the temporal distribution of key terms in the abstracts of the reviewed scientific manuscripts. In addition, a keyword co-occurrence analysis will be implemented to identify nodes and relationships between keywords, allowing for a visualization of the predominant themes in the literature. This approach will facilitate the identification of patterns and trends, providing a detailed view of the way in which ChatGPT is impacting academic writing in terms of frequency of use and areas of influence.

2.2 Data Collection Process

The data collection process was initially carried out through an exhaustive search process in the Scopus database, using a search equation that included relevant key terms to identify research on the use of ChatGPT and university academic writing, as shown in Table 1. Boolean connectors such as OR and AND were used to combine terms with “ChatGPT”, “large language models”, “academic writing”, “reports”, “essays” and “thesis writing”, ensuring the capture of a variety of academic documents related to the field of study. The Scopus database was selected because this repository indexes relevant and reliable scientific literature, derived from scientific journals that evaluate their manuscripts through a double-blind peer review process. Thus, the Scopus database provides access to reliable information for bibliometric analysis. Furthermore, Scopus provides advanced search filters, including the possibility of refining the results by year of publication, by type of document, and by excluding, for example, letters to the editor, notes and editorials.

Table 1: Search equation used for the initial identification of scientific manuscripts

Database	Search equation
Scopus	((TITLE (chatgpt) OR TITLE-ABS-KEY (large AND language AND models) OR TITLE-ABS-KEY (LLM))) AND ((TITLE (academic AND writing) OR TITLE (essay AND writing) OR TITLE (reports AND writing) OR TITLE (thesis AND writing)))

Figure 1 shows the stages that make up the data collection process, which are made up of "Topic, identification and scope", "Screening" and "Included", which is an adaptation of the PRISMA methodology (Preferred Reporting Items for Systematic reviews and Meta-Analyses) that allows for the rigorous extraction of data or scientific articles (Chamorro-Atalaya, Morales-Romero et al., 2023). In the first stage, the research topic was defined and the temporal coverage was established as being 2022-2024, because ChatGPT was launched at the end of 2022. In this stage, 71 scientific manuscripts were identified as follows: scientific articles (33); conference papers (10); review articles (3); letters to the editor (8); editorials (7); and notes to the editor (6). In the second stage, the inclusion and exclusion criteria were applied. Inclusion criteria included scientific manuscripts—such as scientific articles, conference papers and review articles—and studies that focus on the university and postgraduate levels of education. On the other hand, the exclusion criteria included scientific manuscripts—such as letters to the editor, editorials and notes to the editor—as well as studies that focused on the primary, secondary or preparatory levels. By applying these criteria, the number of manuscripts was reduced to 50. In the third stage, the content of each article was reviewed, in order to suppress or reduce any type of bias in the review of the existing literature as far as possible. Of the 50 articles selected, it was confirmed that all complied with the aspects planned to be reviewed in terms of concordance and coherence, so no further manuscripts were omitted.

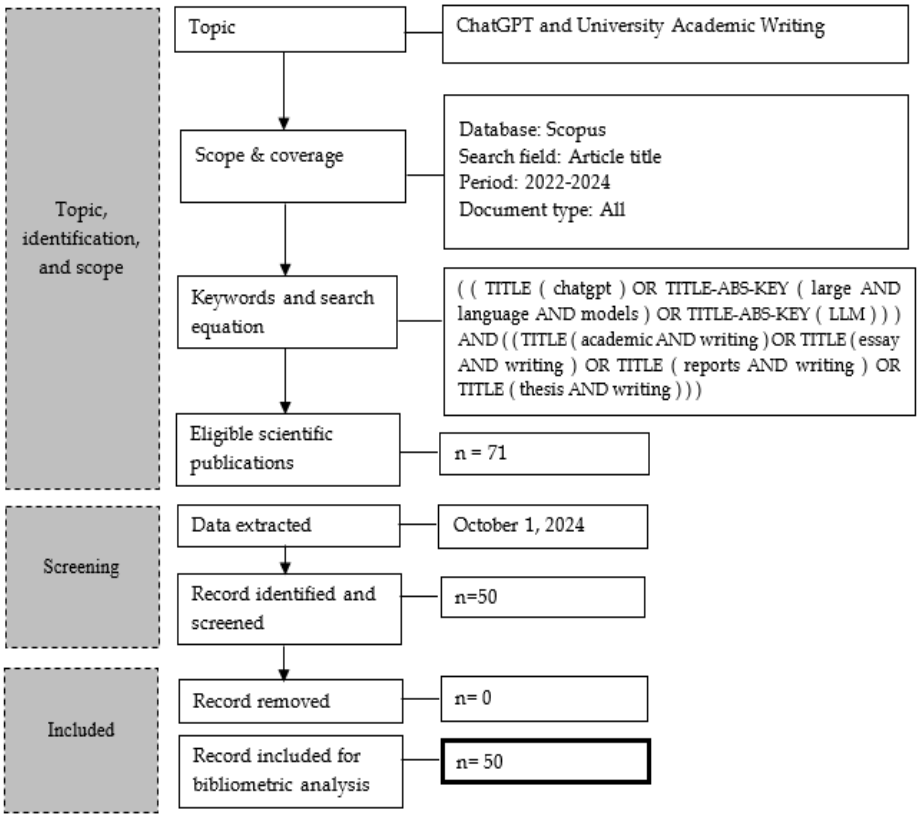

Figure 1: Stages in the extraction process of scientific manuscripts

3. Results and Discussion

3.1 What has Been the Scientific Production on ChatGPT in the First Two Years since its Creation, in terms of Type of Document and Type of Sources?

Of the 50 manuscripts reviewed, it was identified that in the first months since the appearance of ChatGPT, no scientific publication was produced on its application or implications in academic writing. However, in 2023, 32 manuscripts were generated on the subject and, so far in 2024, that production has already been surpassed, reaching 39 studies in the last quarter. This indicates an exponential growth in interest and research on the implications and impact of ChatGPT in academic writing, which reflects the growing concern among the academic community regarding the way in which this tool is transforming not only the quality and originality of writing, but also the processes of knowledge production in the university environment. When categorizing the 50 manuscripts included in the bibliometric review according to the type of documents, it was observed that scientific articles represent 50% of the total, conference papers account for 20%, book chapters comprise 8% and review articles represent 6%. This predominance of scientific articles highlights the fact that the interest in ChatGPT is mainly focused on studies with an application focus, which seek to explore its effects and implications in the academic environment.

However, one aspect to take into account is that, of the 71 manuscripts initially identified on ChatGPT and academic writing in the field of higher education in the Scopus database, the number of scientific manuscripts was reduced to 50 after applying the inclusion and exclusion criteria. The 21 excluded manuscripts correspond mainly to notes, editorials, and letters to the editor, which did not meet the established inclusion criteria for the present study but nevertheless represent a significant portion of the discussion on ChatGPT. In general terms, if the inclusion and exclusion criteria regarding the type of manuscripts were disregarded, it can be identified that 29.6% of the total publications to date on the subject under study are comprised of letters to the editor, notes, and editorials; in other words, these account for almost one-third of the total publications. Figure 2 shows a comparison of the annual scientific production of manuscripts when including notes, editorials and letters to the editor and when excluding these types of scientific documents.

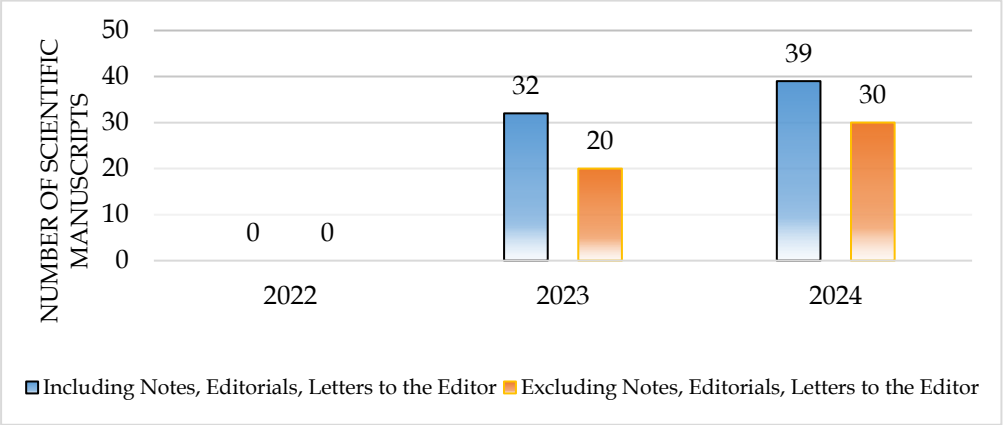

Figure 2: Comparison of annual scientific production of manuscripts when including and when excluding notes, editorials and letters to the editor

The fact that almost one-third of the reviewed manuscripts are letters to the editor, notes and editorials suggests that ChatGPT has generated significant and early debate about its use, especially in terms of ethical issues, academic integrity and the responsible use of AI in higher education. In this regard, Alahdab (2024) highlights in his note that advances in artificial intelligence such as ChatGPT have facilitated the production of academic content, but have also raised ethical dilemmas that require attention, especially considering their impact on the integrity of scientific writing. In this same vein, García (2024)'s letter points out that such tools are democratizing access to academic writing in English education contexts, but that there remains a need to personalize writing tasks to ensure that academic integrity is maintained. Furthermore, a letter from Arachchige (2024) insists that clear ethical guidelines must be established for the use of ChatGPT in scientific writing, underlining the urgency of a responsible implementation in all academic areas. On the other hand, Wang and Yokohama (2024) advocate in their note for an active regulatory approach rather than a total ban, suggesting that controlled inclusion of AI can generate more positive outcomes for academia. Similarly, an editorial by Nayak and Gogtay (2024) reinforces these points by highlighting that, although ChatGPT has been revolutionizing academic writing, it is crucial to address the issues related to authorship and creativity in order to preserve intellectual integrity. As is evident, considerable concern has arisen regarding the need to address the implications of ChatGPT in academic writing, not only among scientific articles but also including letters to the editor, notes, and editorials, which represent key vehicles for expressing critical thinking, outlining preliminary ideas, and establishing positions on a technology that is relatively new.

3.2 What are the Most Relevant and Prevalent Terms regarding the Implications of ChatGPT in Academic Writing in Higher Education, in the Recent Scientific Literature in the Scopus Database?

Before describing the prevalent thematic areas of ChatGPT and academic writing in the scientific literature on documents indexed in the Scopus database, a frequency analysis of bigrams contained in the abstracts of the reviewed scientific manuscripts was carried out, the results of which are provided in Table 2. This analysis revealed that the term "academic writing" had the highest frequency, with 81 mentions, followed by "artificial intelligence" with 22 mentions, "language models" with 16 mentions and "writing skills" with 15 mentions. In addition, other terms such as "academy integrity" and "language model" also stand out with significant frequencies. According to these results, the discussion around ChatGPT in academic writing has been mainly focused on writing quality, academic integrity and the impact of long-form language models (LLM) on scientific production. These topics will be explored further in the analysis of the prevalent thematic areas and their evolution over the last two years.

Temporal indicators such as Year (Q1), Year (Median) and Year (Q3), obtained from the Bibliometrix software, were also analyzed to identify the chronological distribution of the key terms. Year (Q1) represents the first quartile, or the year in which 25% of the mentions of the term began to appear, while Year (median) indicates the midpoint at which 50% of the mentions were reached and Year (Q3) reflects the point at which 75% was reached. In this way, "academic writing"

shows stability with consistent mentions from 2023 to 2024, indicating that it is a fundamental topic in this field of study. In the case of "artificial intelligence" and "language models", a prominent presence was maintained, suggesting a constant focus on the effects and applications of these technologies in academic writing.

Table 2: Frequency and temporal evolution of key terms related to ChatGPT and academic writing

Term	Frequency	Year (Q1)	Year (Median)	Year (Q3)
Academic writing	81	2023	2024	2024
Artificial intelligence	22	2023	2023	2024
Language models	16	2023	2023	2024
Writing skills	15	2024	2024	2024
Academic integrity	13	2023	2024	2024
Language model	8	2023	2023	2024

Similarly, by performing a co-occurrence analysis, 28 nodes were identified, which are classified or grouped into three clusters, as shown in Table 3. Cluster 1 includes terms such as "ChatGPT", "academic writings", and "language model", reflecting a focus on the direct relationship between LLM models and their impact on academic writing. The Betweenness, Closeness and PageRank indicators reinforce the importance of these terms, with "ChatGPT" presenting a Betweenness of 140,039, which evidences its centrality in the co-occurrence network, as shown in Figure 3. Cluster 2 is dominated by terms such as "computational linguistics", "linguistic features" and "students", which suggests an interest in linguistic analysis and the educational use of artificial intelligence. In terms of Page Rank, which indicates the overall importance of a node in the co-occurrence network, the term "linguistic features" stands out with a value of 0.036, indicating its relevance within this cluster. Finally, Cluster 3 includes terms such as "artificial intelligence", "writing" and "human", which have a high Betweenness; for example, "artificial intelligence" scored 59.259, which shows its central role in the interaction between artificial intelligence and human creative processes.

Table 3: Co-occurrence indicators of key terms in literature and academic writing

Node	Cluster	Betweenness	Closeness	PageRank
artificial intelligence	3	59.259	0.029	0.09
language	3	0	0.023	0.038
writing	3	8.207	0.025	0.056
human	3	25.148	0.026	0.081
humans	3	6.483	0.024	0.057
article	3	4.528	0.024	0.051
female	3	0	0.018	0.02

male	3	0	0.018	0.02
medical literature	3	1.622	0.023	0.039
natural language processing	3	0	0.018	0.016
plagiarism	3	1.226	0.023	0.035
medical student	3	0	0.017	0.011
publication	3	0	0.018	0.019
scientific literature	3	0	0.021	0.019
large-scales	2	0	1	0.036
linguistic features	2	0	1	0.036
chatgpt	1	140.039	0.031	0.11
academic writings	1	41.575	0.025	0.076
language model	1	3.914	0.022	0.044
computational linguistics	1	0	0.019	0.027
students	1	0	0.019	0.019
LLM	1	0	0.019	0.018
natural language processing	1	24	0.019	0.022
‘current	1	0	0.016	0.009
language processing	1	0	0.013	0.012
openAI	1	0	0.019	0.019
social media	1	0	0.018	0.009
writing process	1	0	0.019	0.012

As represented in Figure 3, the co-occurrence network allows for clearly visualizing how the most used terms in the scientific literature on ChatGPT and academic writing are related to each other, including the link strength. As mentioned in Table 3, three clusters were identified, which are now graphically shown. Cluster 1, highlighted in red, is centered on the term “ChatGPT”, which appears as the most dominant node in the network due to its high centrality, meaning that it is highly connected to other terms. This cluster also includes terms such as “academic writings” and “language model”, reflecting that the debate on ChatGPT revolves around its impact on academic writing through long language models (LLM). On the other hand, Cluster 2, represented in green, shows a strong connection between terms such as “artificial intelligence”, “writing” and “human”. These terms indicate that research is also focused on the way in which artificial intelligence impacts on human creative processes, especially in writing. The high co-occurrence of these terms points to the importance of AI not only as a tool, but also as an element that interacts with human skills. Finally, Cluster 3, represented in blue, is characterized by terms such as “computational linguistics”, “linguistic features”, and “students”, suggesting that part of the discussion is centered on linguistic analysis and the educational impact of these tools, particularly in the academic environment.

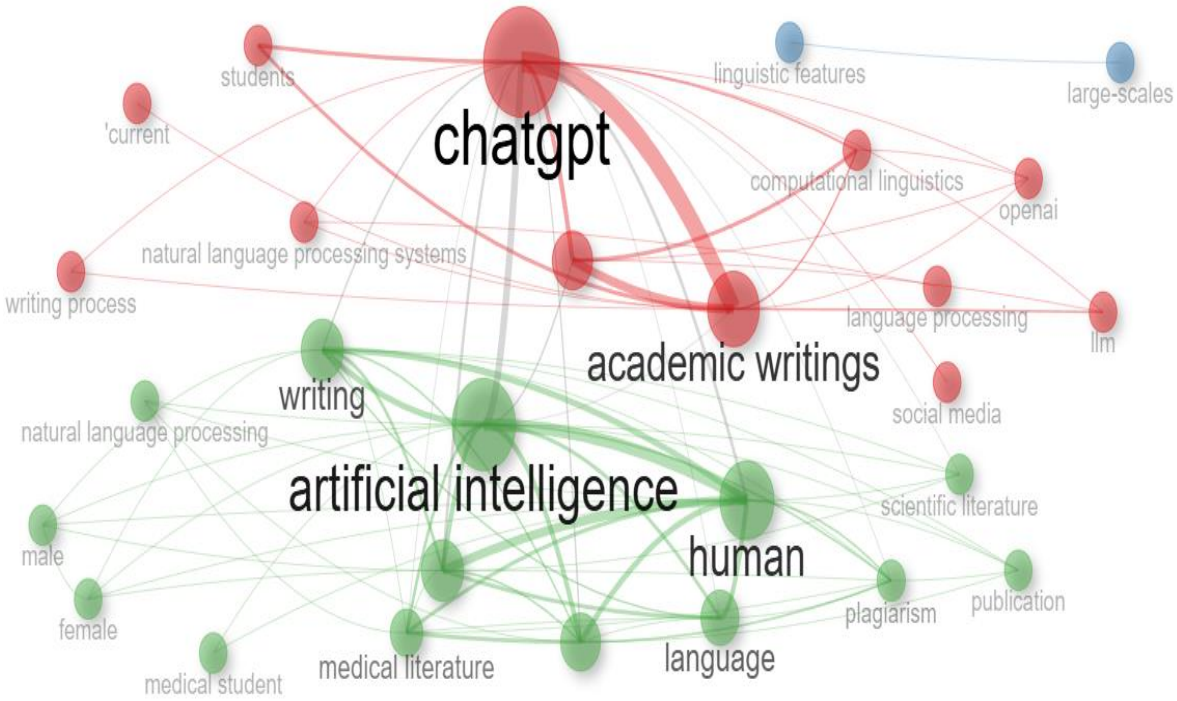

Figure 3: Co-occurrence network of key terms in literature and academic writing

Regarding the key terms identified in the co-occurrence matrix, several authors have explored the relationship between ChatGPT and academic writing, highlighting the impact of using extended language models in academic writing. Xu and Jumaat (2024) argue that ChatGPT improves the organization of ideas and textual coherence in ESL learners, reflecting the relevance of terms such as "academic writing" and "language models" in the network. Similarly, Werdiningsih et al. (2024) note that ChatGPT can improve fluency and accuracy in academic writing, contributing to the structure of texts, an essential aspect in the academic writing process, which is also reflected in the strong connection between "writing skills" and "language models" in the co-occurrence network. Furthermore, Alkamel and Alwagieh (2024) argue that ChatGPT facilitates the improvement of language skills such as grammar and spelling, which is linked to the high rate of mentions of the term "writing skills" in the results obtained. In addition, Yuan et al. (2024) emphasize that ChatGPT allows students to focus on the creative and structural aspects of their essays, which coincides with the significant presence of terms such as "academic writing" and "artificial intelligence" in the co-occurrence network. Overall, the cited authors agree that ChatGPT is directly impacting the way in which students approach and improve their academic writing, which is reflected in the most prevalent terms in recent literature.

3.3 What are the Implications of Using ChatGPT in Academic Writing in the Field of Higher Education?

Based on the content analysis of the 50 reviewed scientific manuscripts, it was identified that 22 studies focus on "Quality and development of writing skills" and another 22 focus on "Risks related to integrity and ethics in academic writing", while only six focus on "Educational assessment". These findings

suggest a divided view of the literature on the use of ChatGPT in university academic writing. On the one hand, studies that point to the improvement in writing quality indicate that ChatGPT has proven to be effective in improving the fluency, coherence, organization and grammatical accuracy of academic writing, especially among those students for whom English is not their native language. This group of studies highlights the benefits of the tool in helping students to develop their writing skills and facilitate their learning process. However, an equal number of investigations warns about the ethical risks and academic integrity concerns that arise along with the use of ChatGPT. Among the main problems identified are lack of originality, risk of plagiarism, over-reliance on the tool and inaccuracy in AI-generated bibliographical references. Without offering effective control over the accuracy of sources or verification of facts, the use of ChatGPT may compromise the authenticity of students' academic work, according to these studies. Furthermore, by allowing the automatic generation of texts, there is a concern that using ChatGPT will prevent students from adequately developing their critical writing and thinking skills. Regarding the six studies that focus on educational assessment, an emerging trend is observed among teachers using ChatGPT as a tool to automate and support the revision of academic works, especially in the correction of grammar, writing and structure of texts. These studies suggest that ChatGPT can be a useful resource for reducing the administrative burden of teachers, allowing them to focus more on the qualitative aspects of learning. However, they advise ensuring that this technology is not completely excluded, but rather implemented in a controlled and supervised manner by teachers so that students do not develop excessive dependence. Table 4 shows the categorization of the implications of using ChatGPT in academic writing.

Table 4: Categorization of the implications of using ChatGPT in academic writing

Category	Evidence of the impact of ChatGPT	Author/s
Quality and development of writing skills	Significantly improves the academic writing skills of non-native English learners, facilitating language learning.	Li et al. (2024)
	It has a positive impact on improving writing skills in English as a second language.	Mahapatra (2024)
	It improves aspects of writing such as coherence and cohesion; however, it should be used as a complement and not a substitute for writing.	Baldrich and Domínguez-Oller (2024)
	Improves the effectiveness of academic writing strategies by helping EFL learners organize their ideas.	Xu and Jumaat (2024)
	Essay detectors generated by ChatGPT can be highly accurate and, when carefully developed, are free of bias in non-native speakers.	Jiang et al. (2024)
	The study shows a positive experience	Picciano (2024)

	with ChatGPT for use in essay writing.	
	ChatGPT makes academic writing in English easier, providing fluency and structure in texts.	Yuan et al. (2024)
	Postgraduate students perceive ChatGPT as a useful and easy-to-use tool in thesis writing, improving the quality of writing.	Rababah et al. (2024)
	A workshop on using ChatGPT can improve writing skills in English as a second language.	Dillon et al. (2024)
	ChatGPT improves the fluency, accuracy, and quality of academic writing among English language learners.	Alkamel and Alwagieh (2024)
	The study shows an improvement in the quality of writing among students of English as a second foreign language.	Werdiningsih et al. (2024)
	Students perceive ChatGPT as a tool that improves writing, although they face challenges in writing.	Kim et al. (2024)
	ChatGPT significantly improves the efficiency and quality of academic writing among graduate students.	Feng (2024)
	ChatGPT improves academic writing by facilitating the generation of new ideas and improving technical aspects such as grammar and syntax.	Rezaei et al. (2024)
	The study shows that paraphrasing provided by ChatGPT improves academic writing skills.	Emran et al. (2024)
	The study proposes phases to integrate the self-regulated learning of AI tools to improve academic writing.	Kong et al. (2024)
	A large corpus of writing features contributes to improving aspects such as grammar and spelling by providing unique feedback.	Deane et al. (2024)
	ChatGPT is useful for academic writing, especially for novice researchers.	Mondal and Mondal (2023)
	ChatGPT is a useful tool for correcting summaries and should therefore be used as support in medical writing.	Ho et al. (2023)
	The study reveals that ChatGPT has the potential to facilitate academic writing by generating ideas, paraphrasing and correcting texts.	Alqadi et al. (2023)

	The study proposes new tasks to improve the quality of formal writing at the paragraph level; although ChatGPT models show improvements, their accuracy still needs to be improved.	Diao et al. (2023)
	The study shows that ChatGPT significantly improves writing skills in EFL learners.	Song and Song (2023)
Integrity and ethics in academic writing	AI models are not reliable enough for rigorous academic writing topics.	Garg et al. (2024)
	While ChatGPT can generate a scientific article with minimal incidences of plagiarism, inaccuracies in references and certain contextual inaccuracies were found. Its use has limitations.	Safrai and Orwig (2024)
	The study demonstrates the limited acceptance of ChatGPT by many scientific journals, even to the point of rejection, highlighting the need for ethical policies.	Lee et al. (2024)
	There is an urgent need to establish clear policies on the use of ChatGPT in peer review processes in scientific journals.	Lee (2024)
	Ethical concerns and a lack of policy clarity persist regarding the use of ChatGPT in academic writing.	Spirgi et al. (2024)
	Evidence shows that ChatGPT-generated text detectors require improvement; there is a need to protect academic integrity against automatically generated texts.	Dou et al. (2024)
	While ChatGPT can be useful, it also poses risks, such as dependency and the deterioration of typing skills.	Rezaei et al. (2024)
	This study determines the need for students to assume greater responsibility and ethics in their writing process.	Bekker (2024)
	ChatGPT shows a limited ability to interpret scientific data, so an emphasis should be placed on transparency and ethical use.	Semrl et al. (2023)
	While ChatGPT can be useful in medical writing, it raises concerns about academic integrity.	Liu et al. (2023)
	It is necessary to establish clear guidelines centered on ethics and academic integrity, focusing on the review of scientific articles.	Casal and Kessler (2023)

	This study highlights the importance of using models such as ChatGPT in an ethical manner, defining good practices regarding their use in academic writing.	Buruk (2023)
	ChatGPT can be a valuable tool; however, it raises concerns regarding content accuracy and plagiarism.	Hwang et al. (2023)
	The study highlights the need to follow clear citation guidelines to recognize AI contributions and ensure ethical use.	Jarrah et al. (2023)
	This study highlights the ethical challenges that ChatGPT poses in academic writing, highlighting concerns about transparency and credibility.	Bakla (2023)
	It is important to use tools that detect scientific writing created by artificial intelligence, ensuring authenticity in academic production.	Desaire et al. (2023)
	This study highlights the importance of considering security risks when using AI tools and the need to protect academic knowledge against potential threats.	Potter and Palmer (2023)
	Rather than rejecting the use of ChatGPT in academic writing, the focus should be on how to use it judiciously, ethically and responsibly.	Alberth (2023)
	There is a need to develop clear strategies to prevent academic misconduct when using ChatGPT.	Busch and Hausvik (2023)
	The study establishes that ChatGPT cannot be used as a reliable tool for academic writing.	Mahyoob et al. (2023)
	The study highlights the need to maintain high ethical standards, given that ChatGPT cannot be considered a co-author due to its lack of critical capacity.	Doskaliuk and Zimba (2023)
	The study highlights concerns about the authenticity and credibility of the work produced by ChatGPT. It highlights the need for thorough ethical debates.	Dergaa et al. (2023)
Educational assessment	The study shows that future teachers will be able to identify ChatGPT essays accurately. This impacts educational assessment by suggesting new ways of assessing creativity and originality in writing.	Bohlmann and Berger (2024)
	This highlights the potential of ChatGPT	Pack et al. (2024)

	as a useful tool for automated grading, alleviating the burden on teachers.	
	The study reveals that ChatGPT has potential for grading texts from non-native English learners.	Makarova et al. (2024)
	ChatGPT still shows inconsistency when grading essays compared to human raters.	Bui and Barrot (2024)
	ChatGPT effectively complements teachers' assessment of academic writing by providing feedback.	Lu et al. (2024)
	Reliance on this tool could be misleading, as ChatGPT-3.5 for essay writing does not significantly improve writing quality.	Bašić et al. (2023)

In line with the results obtained, several authors are united in highlighting that ChatGPT has had a significant impact on the "Quality and development of writing skills" in the academic context. Li et al. (2024) pointed out that the use of ChatGPT significantly improves the writing skills of students who are not native English speakers, facilitating the learning and correction of the language, which reinforces its effectiveness as a complementary tool. Furthermore, Mahapatra (2024) also noted that ChatGPT contributes to improving fluency and coherence in writing, providing valuable feedback for the development of writing skills. Baldrich and Dominguez-Oller (2024) corroborate these observations by showing that ChatGPT can serve as an effective complement in academic writing, improving aspects such as academic cohesion and structure. Regarding "Academic integrity and ethics in writing", other studies have pointed out the risks associated with the use of ChatGPT, mainly in terms of plagiarism and lack of originality. In their study, Garg et al. (2024) warn that although ChatGPT is useful in generating texts, it does not always guarantee the accuracy of bibliographic citations, which can lead to unintentional plagiarism. Similarly, Safrai and Orwig (2024) raise concerns about the ethical use of AI, suggesting that, without proper supervision, students may become overly reliant on the tool, thereby undermining the authenticity of their writing. Finally, in the area of educational assessment, some authors suggested that ChatGPT can also play a key role in automating and improving text assessment. Kim et al. (2024) indicated that teachers have started using ChatGPT to automate feedback on student work, which facilitates the assessment process and allows for a more efficient approach.

4. Conclusion

From the results, it was identified that scientific production on the use of ChatGPT in academic writing has grown rapidly in almost two years since the creation of this tool, indicating a significant interest in areas such as AI-assisted writing and its ethical implications. In addition to the co-occurrence analysis, it was identified that the most recurrent terms are linked to academic writing, artificial intelligence and academic integrity, reflecting both the concerns and opportunities that ChatGPT brings to this field. Similarly, three main areas of implication were

identified from the content analysis, which are categorized as follows: Quality and development of writing skills; Integrity and ethics in academic writing; and Educational evaluation. An equal distribution was noted between the studies that highlight the benefits of the tool and those that warn of the risks. Thus, it is concluded that the use of ChatGPT in academic writing has both positive and negative implications, improving the academic quality of writing in certain aspects while also raising legitimate concerns regarding academic integrity and excessive dependence on technology. Furthermore, its potential as a support tool for educational assessment is highlighted, although an appropriate regulatory framework is required. Such conclusions lead to the recommendation that future studies should focus on the effectiveness of institutional policies on the use of ChatGPT, as well as exploring the ways in which this technology can be used to foster critical and creative skills in students.

5. Future Research

Future research should focus on systematic literature reviews that delve into key areas such as the impact of ChatGPT on the development of specific academic writing skills, risks related to academic integrity and ethics, and its role in educational assessment. These reviews will allow for a more detailed analysis of how ChatGPT improves aspects such as fluency and coherence, as well as addresses ethical challenges such as plagiarism, and supports automated feedback processes, providing a theoretical framework for future applications in higher education.

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