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The use of ChatGPT in academic writing: a case study in Education

The use of ChatGPT in academic writing: A case study in Education

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RESUMEN
La Alfabetización académica enfrenta nuevos retos con la emergencia de la Inteligencia Artificial, concretamente en el ámbito de la escritura académica universitaria. Por ello, este estudio investiga el impacto de ChatGPT en la calidad de los trabajos académicos de 33 estudiantes (7 grupos) del Grado de Educación Infantil. El proyecto se desarrolló en tres fases, mediante un estudio de caso descriptivo con enfoque cualitativo, que consistió en: 1) una evaluación inicial mediante una encuesta *ad hoc* cerrada para conocer las experiencias previas al uso de ChatGPT 2) un análisis comparativo de trabajos académicos con y sin ChatGPT analizado mediante una rúbrica y una tabla comparativa 3) una encuesta *ad hoc* de preguntas abiertas para conocer las experiencias del proyecto que posteriormente se categorizaron con el Software Atlas.ti. Los resultados revelan mejoras en la escritura de los trabajos como en coherencia, cohesión, lenguaje académico... pero también ciertas deficiencias. Se concluye que ChatGPT puede servir como complemento de trabajos académicos, siendo más efectivo cuando los estudiantes ya poseen una base en habilidades críticas, éticas y argumentativas.

ABSTRACT
Academic Literacy faces new challenges with the emergence of Artificial Intelligence, specifically in the field of university academic writing. This study investigates the impact of ChatGPT on the quality of academic work from 33 students (7 groups) in Early Childhood Education. The project was developed in three phases, through a descriptive case study with a qualitative approach, consisting of: 1) an initial assessment using a closed ad hoc survey to understand experiences prior to using ChatGPT, 2) a comparative analysis of academic work with and without ChatGPT using a rubric and a comparative table, 3) an ad hoc open-ended survey to understand project experiences, later categorized with Atlas.ti software. The results reveal improvements in writing such as coherence, cohesion, academic language, but also certain deficiencies. It is concluded that ChatGPT can serve as a supplement to academic work, being more effective when students already have a foundation in critical, ethical, and argumentative skills.

PALABRAS CLAVES · KEYWORDS
Inteligencia artificial; alfabetización académica; estudio de caso; ChatGPT; argumentación escrita
Artificial intelligence; academic literacy; case study; ChatGPT; written argumentation

1. Introduction

New challenges and opportunities for academic contexts emerge as new technologies become embedded in society. In this scenario, academic literacy represents an evolving concept that encompasses critical competencies for effective student participation in university communities (Guzmán-Simón & García-Jímenez, 2015). At its core, academic literacy focuses on the ability to understand and produce disciplinary texts, a process that goes beyond the simple decoding of information to encompass participation in socially recognised knowledge practices (Carlino, 2013; Maldonado et al., 2023). This approach has undergone a notable shift from teaching decontextualised reading and writing skills to more situated approaches that promote immersion in the discourses specific to each field of knowledge (Padilla & Carlino, 2010).

In this context, written argumentation plays a crucial role, since, through its discursive strategies, individuals can actively contribute to the construction of knowledge (Archila, 2015; Villarroel et al., 2019). Argumentation allows students not only to present their ideas, but also to defend, refute and situate them within a broader context, thus contributing to the advancement of knowledge (Bañales et al., 2015). In this sense, argumentation allows for the development of critical thinking and the evaluation of assertions, fundamental components in academia where enquiry and validation of information are fundamental aspects (Kriscautzky & Ferreiro, 2018; Lara et al., 2022).

Teaching written argumentation, as Villanueva et al. (2022) point out, is a complex process that requires fostering both writing skills and logical and critical thinking in students. Not being innate, this skill needs intentional learning and practice (Bañales et al., 2015 and Molina & Carlino, 2013). Otherwise, students may face a significant disconnect between their expectations and the practical skills required in their training, as suggested by Toledo (2019). For that reason, the multiplicity and variability of discursive genres in academia, according to the different disciplines, implies a challenge for teachers to identify and explicitly teach the specific characteristics of the texts required in each area (Moore & Mayer, 2016; Navarro, 2019).

Academic literacy also involves the development of digital reading and writing skills. In the information age, intertextuality and networked reading have become indispensable skills (Hernández et al., 2018; Martinez-Gamboa, 2016 and Caro et al., 2023). The ability to adequately cite and argue on digital platforms becomes an indicator of advanced academic literacy. The transition towards the use of digital tools in writing represents a significant leap in this scenario. For example, Mateo-Girona et al. (2021) highlight how digital tools and current contexts can lead to an improvement in argumentative writing skills.

Therefore, educators face the task of teaching writing in an ever-changing digital environment, where the lines between formal and informal writing become increasingly ambiguous (Cassany, 2019). There is a need to educate students on how to write for different audiences and the use of different 'voices' and 'registers'. However, digital tools can lead students to opt for quicker solutions and not to put enough effort into their writing (García & Fernández, 2015 and Cisneros-Barahona et al., 2023).

In this perspective, artificial intelligence (AI) emerges as a potential driver of change in education, whereby the learning experience is personalised and enriched (Aler et al. 2023). This technology not only transforms the way learners access and use content, but also facilitates a more interactive approach tailored to their individual needs (Gómez, 2023; Ruaro & Reis, 2020). The integration of AI in educational processes transcends simple

automation, in which a deeper and more meaningful engagement of students with the study material is fostered (Gómez, 2023; González & Romero, 2022 and Ocaña-Fernández et al., 2019; Prieto-Andreu and Labisa-Palmeira, 2024; Leong et al., 2023).

This transformation goes beyond conventional methodologies. Recent research, such as that conducted by Limo et al. (2023), Dwivedi et al. (2023) and Akiba and Fraboni (2023), shows how ChatGPT can provide personalised feedback to students and play a tutor-like role in academic contexts. These studies highlight that more than 60% of students use this tool for specific academic assignments. Moreover, the functionality of ChatGPT is not limited to tutoring; it can also enhance the learning process and foster the development of critical skills, such as argumentative competences (Acevedo, 2023; Martínez-Comesaña, 2023; Vera, 2023). In addition, Woo et al. (2023) evaluate the effectiveness of ChatGPT in supporting non-native learners of English, concluding that it has enormous potential to facilitate the development of written communicative skills. Consequently, the transformation of pedagogy and the educational experience driven by this technology is a testament to the impact that AI has and can have on the education sector (Calle & Mediavilla, 2021; Chicaíza et al., 2023).

As well as the benefits, there are challenges associated with the use of AI in education (Selwyn et al., 2022). It is essential to maintain a balance between technology and human interaction, as education also involves the development of social and emotional skills (Leão et al., 2022). Furthermore, Ruaro and Reis (2020), Degli-Esposti (2021) and Barrios-Tao et al. (2021) warn about the need to address AI biases, ethical use of data and privacy, as well as the implications of AI management on human autonomy. In this sense, the integration of new literacies, including digital and media literacies, becomes an imperative for an education that must prepare students for a world where argumentation and effective communication are more important than ever and students are shaped as participatory, critical, creative and ethical citizens (Difabio de Anglat & Álvarez, 2017).

However, it should be noted that this research is exploratory in nature since, due to the novelty of this emerging technology, there are hardly any specific antecedents that accurately contextualise the problem addressed in this study and dimension the real scope of our findings. For that reason, the purpose of this research is to test whether ChatGPT can be an effective tool for improving academic work already produced by students. This general purpose is divided into the following specific objectives:

- To assess students' prior ideas about the use of ChatGPT as a suitable tool for developing written composition.
- To compare the differences between the texts produced by students before and after the incorporation of ChatGPT.
- To explore students' perceptions of the use of ChatGPT in their process of developing the theoretical framework.

2. Methodology

In order to achieve the objectives set out in this study, a qualitative approach was adopted through a descriptive case study. This methodology was selected for its ability to provide a detailed and contextualised analysis of students' experiences and perceptions in

relation to the development of a theoretical framework and the use of ChatGPT. According to Yin (2009), descriptive case studies are effective in analysing and understanding the 'what', 'who', 'where' and 'how' of a specific phenomenon, which is ideally suited to meet the objectives of this research. This approach allows for an in-depth understanding of individual and group dynamics in the use of technological tools in education.

2.1. Participants

Seven groups of 4 to 5 members each from the third year of the Degree in Early Childhood Education at the University of Almeria, aged between 20 and 29 years (3 men and 29 women) participated. They were selected from a subject on Development of oral communication skills and their didactics. They were informed about the confidentiality of their data and the objectives of the research, in accordance with the Code of Good Research Practices of the University of Almeria (2011).

2.2. Instruments

A variety of instruments were used in the research to collect and analyse the data obtained, with each one fulfilling a specific and complementary role. Initially, a participant observation method was adopted, based on the principles established by Taylor and Bodgan (1984). This allowed for a direct immersion in the educational environment to closely observe the students' work process. The observation focused on the construction of theoretical frameworks related to the subject matter. After this, the academic material produced by the students was analysed on the basis of the dimensions established by Guadarrama (2008): historical-contextual, conceptual and methodological. This process involved the review of academic works before and after the introduction of ChatGPT to focus attention on changes in the structure, coherence and quality of the theoretical frameworks (de la Peña & Cortés, 2018).

To complement these methods, questionnaires were used at two key stages of the study (de la Cuesta-Benjumea, 2008). It began with an ad hoc closed-ended questionnaire that provided information on students' perceptions and prior experiences with academic writing and artificial intelligence. This initial phase was necessary to establish a baseline of students' attitudes and prior knowledge. Once ChatGPT was used in the development of the proposed assignments, an ad hoc open-ended questionnaire was administered with a qualitative and exploratory approach (Jansen, 2013) in order to gain a more detailed understanding of the students' experiences after using ChatGPT with questions adapted from (Sanchez, 2023) to find out about challenges or limitations, experiences, effectiveness in reviewing group assignments, specific examples about its usefulness in the work, among others.

The combination of participant observation, analysis of academic papers and questionnaires at different stages of the study aims to ensure that data collection and analysis is complete and varied (Aranda and Araújo, 2009).

2.3. Investigation procedure

The study procedure was structured in the following phases (Table 1):

Table 1

Phases of the study

Phase	Description
Phase 1: Observation and initial evaluation	Observation of the academic work process in the development of theoretical frameworks related to the subject content (language components), followed by initial data collection through questionnaires to assess students' perceptions and prior experiences in academic writing and artificial intelligence, in order to establish a benchmark for future comparisons.
Phase 2: ChatGPT implementation	Introduction and explanation of ChatGPT to students as a complementary tool in their academic work, accompanied by the collection of data on student interaction with ChatGPT to monitor its impact on the development of theoretical frameworks.
Phase 3: Comparison and final evaluation	Preliminary comparative analysis of academic papers before and after the incorporation of ChatGPT, followed by the use and adaptation of the de la Peña and Cortés (2018) argumentative text evaluation rubric, and the analysis of the post-ChatGPT questionnaire using Atlas.ti.

2.4. Data analysis

In the data analysis of this research, the closed-ended questionnaire collected through Google Forms was examined to understand students' prior perceptions and skills in academic writing and technology use. This was followed by a comparative table analysis of the students' work, both before and after the use of ChatGPT. This analysis focused on key variables developed from the contributions of Peña and Cortés (2018) and the rubric (Figure 1) of Ramos (2018). These are focused on the use of sources and citations, level of formality, critical analysis, discursive structures, academic vocabulary and metalinguistic awareness. Therefore, the papers were analysed independently of those that had been carried out with ChatGPT to avoid bias in the evaluation and to ensure an objective assessment based on the established criteria (Gerring, 2017). Finally, the final survey data analysis was carried out using emergent coding through the method described by de la Espriella and Gómez (2020). This approach involves a detailed examination of student responses to identify meanings and patterns. Two researchers coded the data independently and then merged their codes to solicit the opinion of a third researcher in cases of discrepancies. This process was complemented by the use of ATLAS.ti software (Version 23.1.0, ATLAS.ti Scientific Software Development GmbH, Berlin, Germany), which facilitated the organisation of categories and the construction of a network of relationships between them.

3. Results

Prior to introducing ChatGPT into the educational process, a survey was conducted to assess students' perceptions and writing skills in relation to Artificial Intelligence. The results showed that 35% of the students were familiar with the concept of ChatGPT, while 31% were less familiar with this artificial intelligence tool, indicating a significant difference. In terms of satisfaction with their writing and argumentation skills, the majority (62%) are confident in their current competences. However, when it comes to difficulties in writing academic texts, almost half of the participants (48 %) did not encounter any obstacles, which could be evidence of a solid foundation of writing skills among the respondents. On the other hand, a considerable proportion of students (42%) considered that AI could be a useful tool to improve their writing; this suggests an openness towards incorporating new technologies in their learning.

After the initial survey, the students produced their work without the use of the tool and subsequently used it to improve the written product. For this reason, in order to assess the impact of this tool, it was analysed through a rubric developed for this research, whose variables are adapted to the dimensions addressed by de la Peña and Cortés (2018), Guadarrama (2008) and Ramos (2018) (Figure 1).

Figure 1

Evaluation rubric

Evaluation Scale (1-5)	Coherence	Cohesion	Academic Language	Grammar	Spelling and Punctuation	Intertextuality/References	Quality of Reasoning	Quality of Ideas
1- Insufficient	Confusing ideas and unclear focus.	Weak connections between paragraphs and poor use of connectors.	Use of informal language and basic vocabulary.	Basic grammatical errors and simple structures.	Multiple spelling and punctuation errors.	Inadequate or incorrect citations and references.	Weak arguments and lack of critical analysis.	Unclear and repetitive ideas.
2- Sufficient	Somewhat scattered ideas and partial lack of focus.	Some weak connections; occasional improper use of connectors.	Mostly informal style and limited vocabulary.	Simple grammatical structures with some errors.	Spelling and punctuation errors.	Incorrect use of citations and non-academic sources.	Simple arguments and limited critical analysis.	Clear ideas with limited relevance.
3- Good	Generally clear ideas with acceptable focus.	Logical connections; correct use of connectors.	Formal style with adequate academic terminology.	Correct use of grammar with few errors.	Few spelling errors and good punctuation.	Correct use of citations and academic references with minor errors.	Reasonable arguments with critical analysis.	Clear ideas with some originality and relevance.
4- Very Good	Well-developed and focused ideas.	Good logical connections and advanced use of connectors.	Formal style with advanced use of academic terminology.	Mostly correct grammar with minor errors.	Very few minor spelling and punctuation errors.	Correct academic citations and references with minor errors.	Solid and well-developed arguments.	Clear and original ideas.
5- Outstanding	Exceptionally clear and well-focused ideas.	Excellent logical connections and advanced use of connectors.	Expert use of academic language and technical terminology.	Impeccable grammar and advanced structures.	Perfect spelling and punctuation.	Precise use of APA citations and high-quality academic sources.	Very solid arguments with deep critical analysis.	Highly original, clear, and relevant ideas.

Note: Prepared by the authors and adapted from research by de la Peña and Cortés (2018), Guadarrama (2008) and Ramos (2018).

In carrying out the comparative analysis, the WG6 group, working with ChatGPT, presented a logical sequence of ideas focused on the concept of "Syntax". This group dealt with topics such as the definition of syntax, its importance in communication, the relevance of syntax today and its influence on digitisation. Despite some areas for improvement, their sequence was coherent and stable as reflected in the rubric. In contrast, the WG5 group, when dealing with Phonetics, focused on defining what phonetics is and its importance in

the educational context. Regarding cohesion, the WG5 group went from not using discourse markers to their use as "However, on the other hand..." but the composition and abuse of these detracts from the linear writing in which they make use of 1 marker every 2 lines. In the use of academic language, WG6 evolved from colloquial terms to more technical language, such as "social phenomena" instead of "things". In terms of grammar, WG2 showed a notable improvement in the variety of syntactic structures with ChatGPT, although concordance errors and the abuse of gerunds persisted, a structure that does not correspond to Spanish linguistic norms, such as "narrating, telling, developing and collaborating" appearing in the same 4-line paragraph. In spelling, WG3 corrected errors such as "valla/vaya", but still had lapses in punctuation, an aspect repeated in all groups in different ranks. Furthermore, with regard to references, WG4 included some that corresponded to APA 7 guidelines, while WG7 still showed errors in textual citations such as "Morris in (1985), defined the pragmatic dimension of semiology with the following words:...". It should be underlined that all groups used an average of 2 to 5 authors. In quality of reasoning, WG4 and WG3 improved in the substantiation of arguments with the tool, although it did not completely eliminate speculation. On the contrary, WG1 detailed its contents in sections with the constant use of hyphens and the abuse of copying direct sentences from ChatGPT.

Once the papers had been analysed, a post-evaluation was carried out to find out the students' perspectives on their experience with the tool, during and after the development of the paper. Below is a table (table 2) with the categories and subcategories, which includes examples of the groups for each subcategory:

Table 2

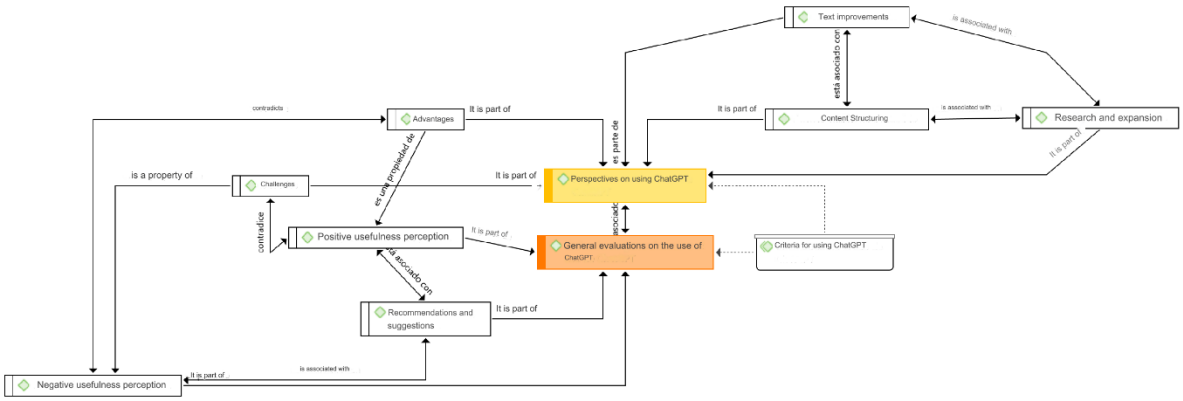
Codificación y categorización de organización en Atlas.ti

Category	Subcategory	examples of responses
Perspectives on using ChatGPT	Structuring content	WG1: "In our case, we used it to structure the script of the podcast, as we are quite inexperienced in this field and it helped us a lot by proposing greetings, catchphrases that engage the receiver and farewells".
	Textual improvements	WG3: "Once the theoretical framework was laid out, we asked him what we could do better to complete it and make the most of the information we had".
		WG6: "It was effective in the sense that it transcribed some text better than what we already had, but I am not a big fan of using Artificial Intelligence".
	Research and extension	WG2: "We used chatGpt to find out more about the topic we were working on, we asked him and he told us what he knew about it, some things seemed interesting to us and we attached them to the work, but merely as a complement to the work we had already done beforehand".
		WG3: "We used it by directly consulting those sections of our work that we thought could be expanded and/or

Category	Subcategory	examples of responses
		perfected, that is, we wanted to extract more information from some specific points of our work [...]"
	Challenges	WG2: "At the beginning we didn't really know how to use it or the possibilities that the platform offered".
		WG6: Quite a lot, because some of the more specific AIs are only designed for English and other languages, but not for Spanish.
	Advantages	WG2: "It was quite effective in terms of broadening my knowledge".
		WG1: "I think it would be interesting to incorporate ChatGPT as another tool when working in the classroom".
General evaluations on the use of ChatGPT	Perception of positive utility	WG4: "In our opinion, we think that using ChatGPT as another resource is good for learning to contrast information and/or detect reliable sources from unreliable ones [...]"
		WG7: "That it is a good tool to rely on in certain grammatical, structural and discursive aspects".
	Negative utility perception	WG6: "I have only used Chat GPT twice and I still don't think it's a very good idea to use this tool because I think it takes away a lot of work and from my point of view we can't let that happen because the creativity and originality of a lot of content [...]".
		WG5: "It should be just a support, the professionals should be dedicated to squeeze their ideas",
	User satisfaction	WG2: "In our case we have nothing to add in terms of improvements, but for those who use it to copy and paste, it would be interesting to be able to make an initial delivery without using chatGpt and then give the possibility to extend it [...]", WG4: "We were a bit more lost when it came to cross-checking information [...]", WG5: "We were a bit more lost [...]".
		WG4: "When it came to cross-checking the information we were a bit more lost.... We would like to know how or what steps to follow to detect the veracity of information given by ChatGPT".

Figure 2

Network of relationships between categories



Note. Own elaboration

One of the most valued applications of ChatGPT has been its ability to assist in structuring and improving texts. Groups such as WG3 and WG7 recognise its usefulness in enhancing theoretical frameworks and completing sections of papers. However, there is also a concern about over-reliance on technology, as WG6 put it: "It was effective in the sense that it transcribed some text better than what we already had, but I'm not a big fan of using AI". In terms of research, several groups have used ChatGPT to expand their knowledge on specific topics. WG2 comments on how they used the tool to gain additional information on their topic of study: "We used chatGPT to further inform ourselves about the topic at hand". However, the integration of ChatGPT into academic research is not without challenges, such as the language barriers mentioned by WG4. Perceptions of the usefulness of ChatGPT vary considerably between the groups. WG1 and WG7 highlight its value in grammatical, structural and discourse aspects. On the other hand, WG6 offers a more critical perspective, warning about the risks of over-dependence on technology: "I have only used Chat GPT twice and I still think that I don't think it is a very good idea to use this tool". In the face of these diverse experiences and perceptions, subjective evaluations emerge from the participants on the usefulness and ease of use of ChatGPT tools. WG5 suggests that ChatGPT should be a support and not a substitute for critical thinking and creativity. In addition, the need to verify the information provided by ChatGPT is a recurring theme. WG4 stresses the importance of learning how to cross-check information and identify reliable sources.

4. Discussion and conclusions

The analysis of the results of this study reveals a notable influence of ChatGPT on the quality of written argumentation in academic contexts. It is observed that some groups experienced a significant improvement in terms of textual coherence and cohesion, while others continued to experience certain difficulties associated with discursive organisation. This disparity makes explicit the need to reinforce the teaching of critical argumentation skills, as reflected by Sánchez (2023), given that reliance on technological tools such as ChatGPT could mask basic deficiencies in essential writing skills. Given this circumstance, it would be advisable to provide specific training for teachers in the didactic use of artificial intelligence

tools and thus minimise the risks of superficial use that is alien to the specific competences that students should attain (Simó et al., 2020).

In addition to this, deficits were observed in the control and validation of the information obtained through ChatGPT. Our findings are in line with those obtained by Zhu et al. (2023) for whom students often do not know how to contrast or verify the information provided by these tools. Ortiz (2023) suggests that, although ChatGPT 3.5 is useful for reviewing material and producing constructive writing, it is not suitable for creating original projects from scratch. This is evidence of the need for human intellectual input into knowledge generation and for policies to regulate the veracity of data produced by artificial intelligence systems.

However, additional research, such as that of Bishop (2023), Gutierrez et al. (2023) and Wang and Xu (2023), presents a more positive picture of ChatGPT's potential for writing improvement. These studies show remarkable improvements in written argumentation. As observed in some of the groups analysed in our research, the use of ChatGPT has facilitated greater fluency and cohesion in the use of discourse connectors, argumentative structures and clarification of ideas, thus demonstrating its value as a complementary tool. Nevertheless, the results corroborate the findings of Carrera et al. (2019), which confirm a discrepancy between university students' self-perception of their writing skills and the quality of their first papers. Despite the fact that more than half of them claim to possess the necessary skills for effective written argumentation, their initial submissions reflect the opposite.

The study also highlights ethical concerns related to the use of ChatGPT, particularly with regard to academic integrity and originality. The variability in the perception of its usefulness and ethics, observed in the different groups studied, highlights the need to focus on issues such as authorship and academic honesty. Atencio-González et al. (2023) and Vera et al. (2023) emphasise that most groups chose to copy directly from ChatGPT without making significant modifications or with the intention of simply transcribing the contents. This highlights the problem of plagiarism and the lack of motivation to explore new possibilities that could enrich the educational process. Similarly, it is important to recognise that the use of tools such as ChatGPT should not replace the author's original work, but serve as a support. Vicente-Yagüe-Jara et al. (2023) highlight that students understood that their role is to complement and not to replace the intellectual effort in the creation of original work and also that instead of prohibiting the use of these tools, the focus should be on adequate control of them.

Therefore, this study shows the need to analyse and guide students in the incorporation of tools such as ChatGPT in academic contexts. It highlights the importance of finding a balance between the adoption of new technologies and the preservation of fundamental educational objectives. The observed variability in the quality of students' written argumentation points to the need to emphasise the development of these skills from the early years of university, as suggested by Malinka et al. (2023). Furthermore, Perkins' (2014) analysis stresses the need to cultivate fundamental skills before introducing advanced tools such as ChatGPT. This perspective, aligned with Melo-Solarte & Díaz (2018), indicates that engagement and entertainment should not be confused with effective learning as ignorance and inadequate implementation of methodologies and tools in the classroom, if not addressed correctly, can have unsuccessful results. Therefore, the integration of technology must be careful, adapting to the specific needs of students and promoting a balanced

approach that fosters both student engagement and the development of critical skills, as Vicente-Yagüe-Jara (2023) points out.

In view of this, it should be noted that, although tools such as ChatGPT have the potential to improve the quality of written argumentation, it is essential that they are properly integrated into the planning of the educational curriculum. This implies designing specific teacher training programmes that train educators in the didactic use of these tools and promote their reflective and critical use among students. Consequently, future research should focus on exploring effective methods for the implementation of artificial intelligence technologies in education, assessing not only their impact on academic performance, but also on the development of competency skills such as critical thinking and the ability to contrast information. In this way, it can be ensured that artificial intelligence tools complement, rather than replace or rely on, the necessary competences that students need to perform successfully in their academic and professional futures (Ortiz, 2023).

It is important to note that this study has several limitations. First, the small number of participants makes it difficult to generalise the results. In addition, the surveys used have not been validated, largely due to the lack of previous research in this new area yet to be explored in depth. It is therefore essential for future research to carry out empirical research in real educational settings. These studies should focus on assessing students' reading and writing skills in order to determine their ability to handle and benefit from the use of tools such as ChatGPT. This practical analysis will allow us to adapt the teaching of these technologies and ensure that they correspond to the current competencies of the student body (Meana, 2018).

In conclusion, this research shows that tools such as ChatGPT can be effective as complements to the work already produced by students and thus bring an additional dimension to the educational process. It is essential, however, to stress the importance of developing critical academic writing skills beforehand. The integration of these technologies should be done in an approach that does not replace, but rather complements and enriches students' analytical and creative skills in a variety of academic and professional settings.

Authors' Contribution

Conceptualization, K. B., J. C. D.-O.; Data curation, K. B., J. C. D.-O.; Formal Analysis, K. B., J. C. D.-O.; Investigation, K. B., J. C. D.-O.; Methodology, K. B.; Project administration, K. B., J. C. D.-O.; Resources, K. B., J. C. D.-O.; software, K. B.; Supervision, K. B., J. C. D.-O.; Validation, K. B., J. C. D.-O.; Visualization, K. B., J. C. D.-O.; Writing – original draft: K. B., J. C. D.-O.; Writing – review & editing, J. C. D.-O.

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