Student Perspectives on the Use of AI-based Language Tools in Academic Writing

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Abstract: Artificial intelligence-based Language Tools (AILTs) are being increasingly used in essay writing in higher education. Its application promotes global and multicultural perspectives in education and plays a critical role in advancing scholarly communication and research dissemination. However, these benefits cannot be measured without also considering student perspectives. This study analyzes the positive and negative aspects identified by students regarding the use of AILTs in their written texts at university. A total of 314 undergraduate and graduate education students were surveyed, and results were analyzed using the Reinert method. The results show that positive aspects are linked to the three pillars of text construction (planning, textualization, and revision). The negative aspects highlight concerns about academic integrity and student competencies. These findings can help guide teachers on how they can promote the responsible and beneficial use of AILTs.

Keywords: artificial intelligence, academic essay writing, higher education, student perspectives, Reinert method

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1. Introduction

Recent advances in artificial intelligence-based language tools (AILTs) have revolutionized the model of teaching in higher education and transformed the writing produced in this context. AILTs include writing assistants, automatic translators, transcribers, and text generators, among others. These technological advances help students tackle the most complex challenges of academic writing, such as literature review creation, drafting, and proofreading (Nguyen et al., 2024). However, they raise concerns about other essential skills for university students, such as critical thinking and academic ethics (Vera, 2023).

Researchers such as Ou et al. (2024) have recently pointed out that we must assume that the use of AILTs for writing is a reality in higher education. Students resort to these tools regardless of the controversies that exist, as they are accessible and readily available. Thus, it is important to understand students' practices and concerns with respect to this new scenario (Alharbi, 2023).

The present research set out to explore the perceptions of students regarding the positive and negative aspects of employing AILTs in their writing. This goal leads to the following research questions: (I) What positive aspects are associated with the use of AILTs for writing in the academic context? (II) What negative aspects are identified by students? (III) Which student profile predominates in the identification of these aspects? Thus, the opinions of 314 undergraduate and graduate students were collected. The responses were analyzed using the lexical analysis software Iramuteq, considering variables such as age, gender, degree, and current academic course or year.

Based on the research goal, the subsequent section presents a review of recent studies on AILTs impact on academic writing. Then, the methodology of the study is presented. This includes a description of the sample, the data collection process, and the data analysis method. Finally, the main findings are outlined and discussed.

2. Artificial Intelligence in Academic Writing

The integration of AILTs into academic essay writing represents a transformative convergence in the educational domain, where both elements mutually reinforce and reconfigure each other. This symbiotic interaction catalyzes the incorporation of global and multicultural perspectives in the educational process, serving as a crucial factor in the evolution of scholarly communication and knowledge dissemination (Malik et al., 2023).

Generally, academic writing has been influenced by the emergence of tools that support research, writing, and dissemination (Strobl et al., 2019). By facilitating access to a vast corpus of information and providing advanced tools for analysis and synthesis, AILTs enhances the ability of students and scholars to produce work that is of greater rigor and depth. Concurrently, the practice of academic writing is transforming due to

the incorporation of advanced technologies that permit greater precision in argument formulation and research presentation. Collectively, this synergy facilitates the wider dissemination of scholarly research, thereby enhancing the quality and impact of global academic discourse (Malik et al., 2023). In other words, AILTs serve to address the more complex aspects of writing academic papers, including literature reviews, information synthesis, and text construction and revision (Nguyen et al., 2024).

Escotet (2023) identified two further benefits associated with using AILTs in higher education. The first benefit pertains to the dissolution of all physical and linguistic boundaries. AILTs enable access to resources in any language, discipline, and context, and increase the rapidity of information access and material updates. Consequently, students have access to a vast array of information anytime, anywhere, which enhances the democratization and inclusion of knowledge.

The second benefit pertains to the tools' capacity to analyze student performance data. The automated analysis of students' writing processes can be employed to predict future learning outcomes. This benefits students and equips teachers with information about their students' needs, as well as guidelines to better tailor their teaching efforts. Furthermore, this information provides educational resources that align more closely with the rhythms, learning styles, and modes of knowledge assimilation of individual students (Salmeron et al., 2023).

A study by Kaneki et al. (2023) empirically validated the potential impact of AILTs on learning experiences. These impacts include students' enhanced creativity, and ability to develop their agility in managing new knowledge. Indeed, students themselves are aware of the usefulness of these tools in improving their performance. As observed by Firat (2023), university students view AILTs as a learning resource and have adapted their writing approach so as to be able to strategically use it. Generally, they perceive AI as a facilitative tool, and are aware of the limitations both of AILTs and of their own abilities.

Nevertheless, for the benefits to be fully realized, a more direct link between educational theories and AILTs implementation in this area is urgently needed. Despite the potential of AILTs to enhance the quality of higher education, there is no assurance that its utilization will inevitably and directly yield optimal writing outcomes. Scholars need to engage in profound pedagogical reflection to critically examine the design of interventions with these tools and the effective delivery of instruction (Castaceda & Selwyn, 2018; Humble & Mozelius, 2022). Per this perspective, Tlili et al. (2023) posited that teacher intervention and guidance are essential for computer-assisted writing to positively influence writing proficiency. Consequently, it is necessary to devise strategic methodologies for effective AI–human collaboration (Molenaar, 2022; Nguyen et al., 2024).

Moreover, research (e.g., Nguyen et al., 2023) has indicated that AILTs impose significant executive demands, necessitating the coordination of cognitive and linguistic activities. The successful use of AILTs thus depends on the ability to employ them strategically. Consequently, two distinct usage approaches can be identified: a proactive

approach, where students actively integrate technology into their learning and knowledge-generation processes; and a passive approach, where knowledge is expected to be generated automatically. Consequently, it is imperative to educate students on the judicious use of these tools, emphasizing critical thinking and judgment. Moreover, when used appropriately, AILTs enable a more efficient use of working memory, rather than reducing cognitive load, thereby enhancing students' academic performance and research capacity.

In contrast, UNESCO (Sabzalieva & Valentini, 2023) directed attention to the ethical concerns associated with AILTs, specifically ChatGPT. First, the utilization of these tools may compromise academic integrity, since the application of text generators increases the risk of AI-authored assignments, examinations, and written work being submitted. This is particularly problematic in the current context, as there are as yet no AI applications that can detect the use of AILTs. This aspect is of particular concern to students, who believe it may affect the evaluation system. Furthermore, the absence of regulation and inadequate control in this field could allow AILTs to be used for purposes that are detrimental to society, as evidenced by the lack of control over data, which could compromise data security (Lund & Wang, 2023). In this context, there is currently no robust legal framework in place regulating the access to and use of user-provided personal information—without distinction, for instance, based on age. Moreover, the fact that AILTs are not governed by clear ethical principles means that they may be susceptible to cognitive bias, as they collect and process information from the internet without distinguishing between right and wrong or true and false.

Additionally, it is essential to work with students on developing critical thinking skills, which are linked to ethical issues raised in literature. Students must be able to evaluate the quality and reliability of AI-generated content. Such critical thinking will also reduce their reliance on automated tools. Consequently, training and education in the effective and responsible use of technology are of paramount importance (Chan, 2023; Tlili et al., 2023). Moreover, Gayed et al. (2022) revealed that as students enhance these skills, their perceptions of, and interactions with, AILTs become more positive and productive. They also observed students' concerns about a potential loss of creativity due to an excessive reliance on AI resources.

Another competency that could be jeopardized is communicative competence. One challenge facing university entrants pertains to the acquisition of academic literacy, which involves internalizing communication forms according to their discipline. This entails recognizing and understanding the discursive practices of the new community of which they are part. Consequently, writing should not be regarded merely as a functional skill but rather as a crucial competence across all domains (Nguyen et al., 2024). Delegating this task to AILTs may limit the opportunity to develop this ability.

In addition to pedagogical, ethical, and competency-development issues, the lack of female participation in AI development is a concern. This absence may perpetuate gender

stereotypes and other forms of discrimination in the content produced and disseminated by this technology (Sabzalieva & Valentini, 2023).

Moreover, although accessibility has been identified as a beneficial aspect, AILTs are currently unavailable in certain countries. Legal restrictions, access issues, and unequal internet distribution impede the technology's equitable adoption (Malik et al., 2023). Similarly, the commercial nature of its development is a further limitation. The trend of commoditizing enhanced AILTs versions by the same developers offering complementary versions is indicative of a tendency to regard AI as a business, contradicting the initial discourse of free access and technology democratization (Sabzalieva & Valentini, 2023).

In essence, the above review of recent studies on the positive and negative implications of AILTs on academic writing underscores the need to prepare the academic broadcasting sector for forthcoming changes and avoid implementing only interim measures or short-term fixes (Friederich & Symons, 2023). This is particularly important given the limited capacity to anticipate potential future applications of AI (Floridi, 2019), and the current paucity of knowledge about how students utilize and perceive the use of AILTs in their written communicative practice (Ou et al., 2024). Consequently, Firat (2023) postulated that there is a need for more empirical evidence on the impact of AI in higher education.

3. Methodology

This paper is part of a larger study that focuses on the uses, perceptions, and relationship between academic writing and AI. To achieve the objectives of this project, both qualitative and quantitative data have been systematically collected through meticulously designed online questionnaires. These surveys incorporate a combination of open-ended and closed-ended questions to ensure comprehensive and detailed responses from participants. Specifically, the present paper details an experimental study aimed at identifying university students' perspectives on the positive and negative aspects of AILTs in academic writing.

3.1 Sample

The sample comprised 314 education students from a public university in Spain, with a mean age of 20.47 years (SD = 3.80). Most of the sample identified as women, accounting for 74.07%, while 21.30% identified as men and 1.54% as nonbinary.

Regarding degree distribution, the largest proportion of students was pursuing degrees in infant education (43.95%), followed by primary education (36.94%), and social education (16.56%), with the smallest proportion pursuing a master's in teacher training of compulsory secondary education and baccalaureate, vocational training, and language teaching (2.55%). Regarding the academic year, the distribution was as follows: 43.63% were first-year students, 26.43% were second-year students, 22.61% were third-year students, 4.78% were fourth-year* students, and 2.55% were master's degree students.

3.2 Procedure and Instrument

The study sample was drawn from the three faculties of education of a public university in Spain. Prior to data collection, approval was secured from the university's ethics committee (M10_2023_166 approval). All participants willingly volunteered for the study and received comprehensive information regarding the research procedures. Informed consent was obtained from each participant before commencing their involvement. Recruitment was carried out using a non-probabilistic snowball sampling method. An online questionnaire was developed and distributed through various channels, including virtual platforms, social networks, and university emails sent by the researchers.

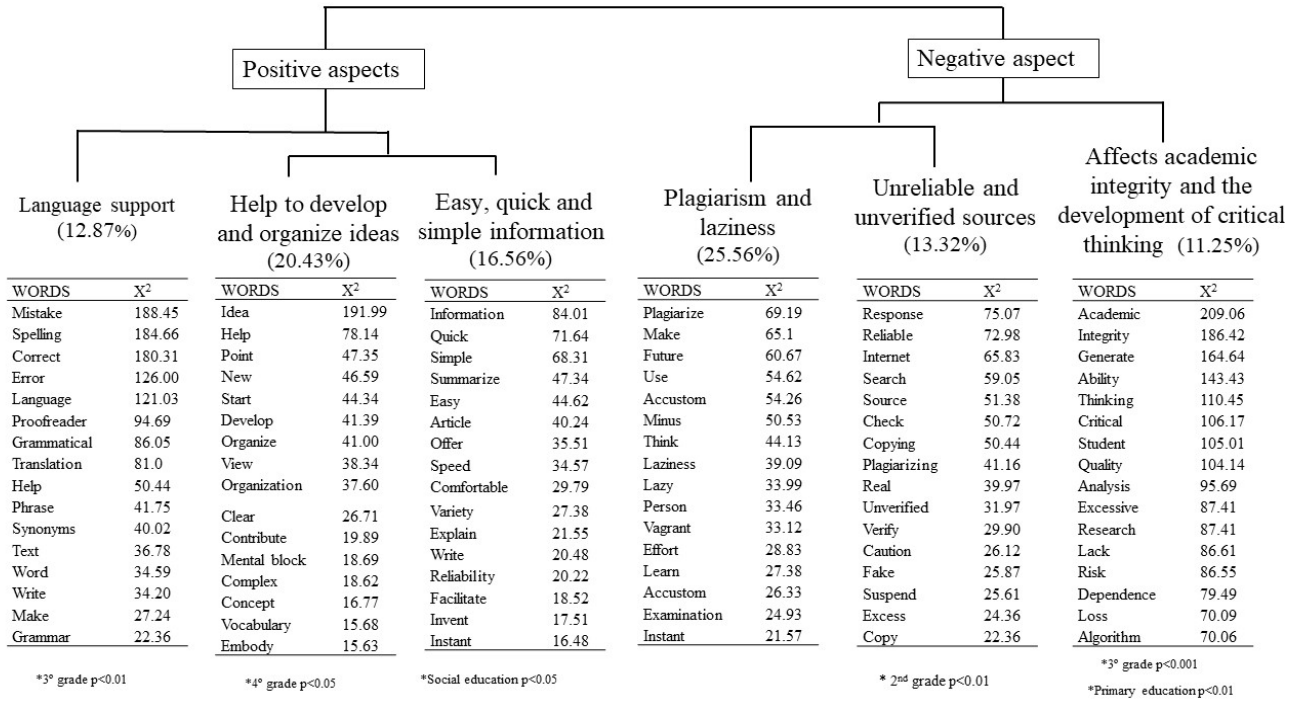
The questionnaires were organized into two distinct sections. Initially, participants were asked to provide specific socio-demographic information pertinent to this study, including their age, gender (with options for male, female, or nonbinary), degree, and current academic course or year.

Subsequently, a free-association exercise was conducted utilizing the Grid Elaboration Method to examine participants' perceptions regarding AILTs use in composing academic texts (Joffe & Elsey, 2014). This methodology, which has been previously applied in studies investigating the collective representations of young people on various subjects (Larruzea-Urkixo et al., 2020; Idoiaga et al., 2021), was selected for its efficacy in eliciting spontaneous responses. Specifically, participants were instructed to list the first three positive and three negative aspects that came to mind concerning AILTs use in writing academic texts (papers, presentations, etc.) in a university context. Thereafter, participants were asked to explain their chosen words or ideas in detail. These explanations provided the foundation for subsequent analysis. Responses were collected in the participants' native language and then translated for publication.

3.3 Data Analysis Method

The present study utilized the Iramuteq software, developed by Ratinaud (2009) and refined by Ratinaud and Marchand (2012), to conduct a comprehensive lexical analysis of the collected corpus of responses. The analysis comprised two distinct methodologies: the Reinert method and lexical similarity analysis.

Primarily, the Reinert method (Reinert, 1983, 1990) was implemented using the Iramuteq software to scrutinize the rationales behind positive or negative aspects associated with AILTs use in academic writing, as articulated by the undergraduate students. This method, which is renowned for its application in the examination of open-ended inquiries (Bereziartua et al., 2023; Boillos et al., 2024), ensures the reliability and validity of textual analysis (Klein & Licata, 2003). Employing a descending hierarchical cluster analysis format, the Reinert method facilitated the identification of classes and statistical indicators, such as typical words and text segments (Idoiaga & Belasko, 2019), with high chi-square values signifying significant repetition among participant responses.



WORDS	X^2
Mistake	188.45
Spelling	184.66
Correct	180.31
Error	126.00
Language	121.03
Proofreader	94.69
Grammatical	86.05
Translation	81.0
Help	50.44
Phrase	41.75
Synonyms	40.02
Text	36.78
Word	34.59
Write	34.20
Make	27.24
Grammar	22.36

*3° grade p<0.01

WORDS	X^2
Idea	191.99
Help	78.14
Point	47.35
New	46.59
Start	44.34
Develop	41.39
Organize	41.00
View	38.34
Organization	37.60
Clear	26.71
Contribute	19.89
Mental block	18.69
Complex	18.62
Concept	16.77
Vocabulary	15.68
Embody	15.63

*4° grade p<0.05

WORDS	X^2
Information	84.01
Quick	71.64
Simple	68.31
Summarize	47.34
Easy	44.62
Article	40.24
Offer	35.51
Speed	34.57
Comfortable	29.79
Variety	27.38
Explain	21.55
Write	20.48
Reliability	20.22
Facilitate	18.52
Invent	17.51
Instant	16.48

*Social education p<0.05

WORDS	X^2
Plagiarize	69.19
Make	65.1
Future	60.67
Use	54.62
Accustom	54.26
Minus	50.53
Think	44.13
Laziness	39.09
Lazy	33.99
Person	33.46
Vagrant	33.12
Effort	28.83
Learn	27.38
Accustom	26.33
Examination	24.93
Instant	21.57

WORDS	X^2
Response	75.07
Reliable	72.98
Internet	65.83
Search	59.05
Source	51.38
Check	50.72
Copying	50.44
Plagiarizing	41.16
Real	39.97
Unverified	31.97
Verify	29.90
Caution	26.12
Fake	25.87
Suspend	25.61
Excess	24.36
Copy	22.36

* 2nd grade p<0.01

WORDS	X^2
Academic	209.06
Integrity	186.42
Generate	164.64
Ability	143.43
Thinking	110.45
Critical	106.17
Student	105.01
Quality	104.14
Analysis	95.69
Excessive	87.41
Research	87.41
Lack	86.61
Risk	86.55
Dependence	79.49
Loss	70.09
Algorithm	70.06

*3° grade p<0.001
*Primary education p<0.01

Figure 1: Hierarchical Clustering Dendrogram Showing the Most Frequent Words and Those With the Greatest Association
Note. $\chi 2$ [1], $p < .001$. Extracted using the Reinert method.

Following precedent methodologies (Camargo & Bousfield, 2009), we input raw data into the Iramuteq software, selecting key vocabulary items within each class based on specific criteria. These criteria included an expected word frequency exceeding three, evidence of significant association using the chi-square statistic ($\chi \geq 3.89$, $p = .05$, $df = 1$), and predominant occurrence within the class (≥50%). Subsequently, text segments associated with each class were identified and categorized based on their respective chi-square values.

These lexical universes were then linked to passive (independent) variables, yielding a comprehensive depiction of lexical worlds. In the present case, the passive variables were age, gender, degree, and current academic course or year. Additionally, a systematic process was adopted to label each class, wherein two researchers independently proposed labels based on associated words and quotations, followed by consensus approval from a third researcher.

Iramuteq was then employed for lexical similarity analysis, focusing on the corpus as a unified entity, irrespective of individual participant responses. This analysis elucidated the structural organization of textual content through the identification of word co-occurrences, thereby generating visual representations of the social representation under scrutiny (Marchand & Ratinaud, 2012).

4. Results

The Reinert method, utilizing descending hierarchical analysis, was employed to identify the primary ideas articulated by participants about using AILTs to write academic texts. Each issue or concept was encapsulated by a collection of characteristic words and text segments referred to as a class. The analysis segmented the corpus into 1,126 sections, yielding six distinct classes (Figure 1). These classes are examined individually in subsequent sections.

Figure 1 shows that the analysis generated six classes. Three of these reflect positive aspects of using AILTs to write academic texts: "language support," "help to develop and organize ideas," and "easy, quick, and simple information." The remaining three classes focus on negative aspects: "plagiarism and laziness" and "affects academic integrity and the development of critical thinking."

The first idea extracted from the hierarchical clustering dendrogram, with a weight of 12.87%, is that AILTs are good tools to improve the linguistic quality of texts and translate them. In fact, students rely on these tools to correct their mistakes and to proofread and translate texts. The following are the most significant quotations (i.e., those with the highest chi-square sum), from this class:

1. "AI corrects spelling or grammatical errors and translates texts into other languages" ($\chi^2 = 969.98$; female, first grade of primary education).
2. "By using a linguistic corrector, we can perceive and correct spelling and grammatical errors. Using a translator, we can learn how to spell certain words

in another language that we do not know" (χ^2 = 898.79; female, third grade of infant education).

3. "AI aids in writing by identifying spelling and grammatical errors, which is important for people struggling with that subject. Concurrently, AI facilitates APA citation, making our work faster and more efficient" (χ^2 = 763.85; female, second grade of social education).

The second positive aspect of using AILTs to write academic texts mentioned by the participants, with a weight of 20.43%, concerns AILTs' ability to help develop and organize ideas. The participants stated that they use them to generate text ideas and structure their academic papers, thus overcoming mental blocks and embodying texts. This idea was more prevalent among fourth-grade students ($p < .05$). The most significant phrases used by the participants to explain this idea were as follows:

4. "AI is very useful when it comes to organizing information, making outlines, and providing great ideas or a starting point. It is often difficult to detect important information and even more challenging to organize it" (χ^2 = 527.15; female, fourth grade of infant education)
5. "AI helps foster imagination. As a support tool, we can discover ideas that we have not considered and see different points of view. Thus, we can develop deeper ideas and delve further into an idea we had planned to develop." (χ^2 = 540.45; male, first grade of primary education).
6. "AI can provide different ideas or perspectives when approaching an assignment. In the moments when you are blank, it can help with vocabulary or writing different texts" (χ^2 = 461.11; female, third grade of infant education).

The third positive aspect, with a weight of 16.56%, pertains to AILTs' ability to provide a wide range of information quickly and simply. The most significant phrases used by the participants to explain this idea were as follows:

7. "AI is valued for its speed, efficiency, and simplicity. It provides a quick way to access information on any topic and is very effective, eliminating the need to search for information and read many papers" (χ^2 = 389.67; female, second grade of social education).
8. "AI is characterized by ease, comfort, and efficiency, providing easy access to reliable information. It [makes] the text quickly understandable." (χ^2 = 354.89; male, first grade of infant education).
9. "You can also adapt AI to different formats based on the type of text you are writing: classwork, dissertation, etc. It searches very quickly for information and presents it in a summarized form" (χ^2 = 340.84; male, master's student).

In contrast, participants highlighted several negative aspects. The first idea, accounting for a weight of 25.56%, is that AI-extracted texts may lead to plagiarism and foster

laziness among students. The most significant phrases used by the participants to explain this idea were as follows:

10. "Nowadays there are simpler ways to do the work without any type of effort and that will be reflected in the people who will form the society in a not-so-distant future, since everything will be plagiarized" (χ^2 = 324.97; female, first grade of primary education).
11. "Work can be plagiarized if [AI] is not used well, since we do not have to get involved so much, little by little we get lazier and lazier at doing work. Furthermore, in the future advanced technologies may replace humans" (χ^2 = 315.39; female, third grade of infant education).
12. "Plagiarism [equals] comfort. Basically, it is something that is done by a robot, so to speak; in my opinion, you have to know how to use it. It should be only an aid; it may create too much comfort and many students use it to do their complete work without contrasting information" (χ^2 = 310.19; female, second grade of social education).

The second negative aspect, comprising 13.32% of the total weight, pertains to AI's association with unreliable and unverified sources. Participants expressed doubts about the reliability of AI-generated information, stating that it may come from untrustworthy sources, leading to their coursework failing to receive a passing grade. The most significant phrases used by the participants to explain this idea were as follows:

13. "Often, the reliability of the information is questionable because it is not sourced from safe sources, it provides us all with the same answer. It can be the case where we all present identical content. It can be detected that it is generated by AI and therefore, fail" (χ^2 = 427.69; female, third grade of infant education).
14. "The information is repetitive and unreliable. Sometimes, if you disagree with the answer and request a new one, it may give you the same initial response. The information is not 100% contrasted, and we do not know its source" (χ^2 = 424.41; female, second grade of social education).
15. "If you do not make certain modifications to the AI-generated text, the data may not be reliable. You will not learn anything if you get caught using it verbatim, which can have serious consequences. Often, the information it provides is not completely reliable because it is sourced from the internet" (χ^2 = 349.63; male, second grade of primary education).

Finally, the last negative aspect, comprising 11.25% of the total weight, is the perceived impact on academic integrity and the development of critical thinking. The participants claimed that using AILTs in writing academic papers without any personal input violates academic integrity. They also voiced concerns about the potential decline in critical

thinking or analytical abilities due to the use of such tools. The most significant phrases used by the participants to explain this idea were as follows:

16. "Over-reliance on AI for text writing may result in the loss of writing and critical thinking skills among students and teachers if technology is used to automatically generate academic content" (χ^2 = 1360.76; female, first grade of infant education).
17. "AI [impedes] skill development. Although AI can produce grammatically correct and well-structured academic texts, [these texts will] lack the critical thinking, originality, and creativity inherent in human writing" (χ^2 = 1145.87; female, third grade of primary Education).
18. "AI may not fully understand the context of a topic or [be unable to] perform deep critical analysis, which may affect the quality and depth of the academic content generated" (χ^2 = 1105.57; female, third grade of primary education).

5. Discussion and Conclusions

This study examined the perceptions of university students regarding AILTs use in text writing. The views of 314 education students were examined using a lexical analysis tool, revealing both negative and positive perceptions. The results demonstrated a consensus on three positive and three negative aspects, corroborating Firat's (2023) observation that users recognize the utility and limitations of these tools. Likewise, results evidence that academic writing can no longer be understood without considering AILTs.

On a positive note, students acknowledged that current tools address complex aspects of academic writing, including accessing information, developing and organizing ideas, and achieving linguistic proficiency (Nguyen et al., 2024). The informants in this study, including those new to university studies, noted that AILTs enhance information access, noting the speed, ease, and comfort related to them. Furthermore, they indicated the diversity of the information that can be accessed. This aligns with Escotet's (2023) proposition that AI facilitates access to sources, regardless of language, discipline, or context. Our findings suggest that students perceive the benefits of the democratization of knowledge.

In contrast, although studies have defended the use of AILTs for improving the content of scientific texts (Strobl et al., 2019), students in our study did not associate these benefits with increased rigor or depth of information. It can be postulated that students associate these positive aspects of AILTs with self-benefit, such as the acceleration of work and enhancement of processes, rather than benefiting the scientific community through increased rigor, source richness, and so on. Here arises the well-known dichotomy between knowledge-telling and knowledge-transforming (Bereiter & Scardamalia, 1987), as students, upon entering the academic environment, do not perceive that they aim to contribute to the transformation of knowledge. While the advent of AI has brought a change of scenery, they still must take on the challenge of learning the modes of interaction within a new discursive community, and already familiar difficulties emerge.

Following Nguyen et al. (2023), it can be concluded that students tend to utilize technology passively rather than actively (Nguyen et al. 2023). However, this is not the case for language proficiency. Learners positively value the ability to refine their written language using natural language processing resources. The applications of these tools are diverse, encompassing translation, query resolution, and grammatical correction. Such tools are also linked to specific terms, including "mistake," "correct," and "error." In this case, learners are aware of their linguistic difficulties; rather than allowing AILTs to perform tasks for them (passive use), they employ them to rectify their own mistakes (active use). From a pedagogical standpoint, this result is noteworthy because it demonstrates that students recognize their writing shortcomings.

Furthermore, our fourth-grade informants emphasized the advantages of AILTs in generating and organizing ideas. Such emphasis could have been due to their increased awareness of academic writing complexities in their final year, leading them to seek methodologies that facilitate the construction of their discourse. Interestingly, participants did not indicate fear that the use or overuse of these resources may cause a deterioration in their written competence, as Nguyen et al. (2024) suggested.

Concerning the benefits of AI, students did not perceive AI's overall impact on the educational process. Despite authors such as Salmeron et al. (2023) acknowledging the value of these tools for teachers, students tended to link the impact of AILTs only on their performance. That is, they perceive a linear relationship between AI and students, where the teacher does not mediate and the goal is improved writing.

With respect to negative aspects, students expressed concern about the potential impact of AILTs on their creative abilities and critical thinking. This aligns with Gayed et al.'s (2022) findings, where students expressed concern about relying excessively on AI, which they perceived as a potential threat to their capabilities. Indeed, students in this study frequently mentioned concepts such as "effort" and "laziness" in relation to AILTs use.

These results contrast with those of Kaneki et al. (2023), who empirically demonstrated that AILTs could help foster creativity and agility in managing new knowledge. However, to achieve this and to optimize the benefits of AI, teachers' mediation is necessary (Molenaar, 2022). Nevertheless, in this study, teachers were relegated to a secondary role.

Moreover, the competencies of creativity and critical thinking are related to the ethical dimension (Chan, 2023). In line with extant studies (see, e.g., Nguyen et al., 2024; Sabzalieva & Valentini, 2023), participants in this research highlighted risks associated with the lack of regularization regarding the ethical use of AI. Specifically, AILTs use may lead students to include inaccurate AI-generated information in their work, or to claim ideas they are not their own. In this case, the solution lies in regulation by universities and governments.

Nevertheless, students in our study recognized the lack of rigor and reliability in AI-generated outputs. The results indicate that a significant proportion of students do not

trust the information they encounter and are aware of the potential inaccuracy of a substantial proportion of the information generated by AI. Consequently, it is important to work with students on developing their academic integrity.

In conclusion, this study demonstrates that students acknowledge both advantages and disadvantages associated with AILTs use in academic writing. Nevertheless, these aspects underscore the need for teacher mediation to maximize the benefit of AILT resources and to utilize them to cultivate key competencies such as critical thinking and problem-solving abilities among university students. Empirical evidence suggests that AILTs offer a limited perspective on reality (Friederich & Symons, 2023). Consequently, academic institutions must seek out innovative and enriching products, while discouraging redundancies.

Moreover, it is essential to comprehend the role of academic practices with AI as a form of social interaction (Ou et al., 2024). Human involvement and decision-making must remain constant throughout the process. It will be the responsibility of individuals to provide rhetorical intelligence and ensure that communication is both effective and empathetic (Bedington et al., 2024).

Notably, this study contributes to the field of academic writing and AILTs use; however, it is part of a broader project aimed at enhancing comprehension of the relationship between writing and AI. As Firat (2023) noted, the rapid evolution of AILTs and their transformative impact on academia underscore the necessity to comprehend the entire ecosystem—this study represents a novel contribution to this research area. It also highlights the need for studies that assess the influence of the teacher's input on the student's perspective. In particular, in those aspects that have been considered negative.

Note

* In the context of this study, university degrees comprise four courses, while master's degrees entail a single course. Consequently, when courses are referenced, they always refer to undergraduate programs.

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