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Special

Possibilities and challenges of Artificial Intelligence in the teaching and learning process of Journalism Writing. The experience in Spanish universities

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Abstract

The research aims to assess the possibilities and challenges of artificial intelligence (AI) for the development of the teaching and learning of journalistic writing techniques in the university educational context. The main objective consists of analysing the abilities of AI to solve the composition of different journalistic texts, both informative and opinion, and the quality of the result, as well as other applications of AI in journalistic writing. The text tries to contribute to the knowledge on the use of AI by teachers and students in the teaching and learning process. A mixed methodology has been used to develop the research: on the one hand, descriptive and comparative, based on surveys to university professors in Spain specialised in this subject and to students taking related contents in their studies, also in this context; on the other hand, an experimental research is included among professors trained in the field of Journalistic Writing, who are asked for the qualified correction of an exam, anonymous, actually carried out with the AI system, ChatGPT. After weighing the results, each of them is interviewed in depth about the quality of the texts, their strengths, and weaknesses. The results show that AI is beginning to be used in the university context by students and professors. In the specific field of journalistic writing, its use for the moment is limited to assisting tasks in the writing process or suggesting topics, while the automatic generation of content is not widely accepted due to the ethical implications that it entails, especially those related to the originality of content. Teachers value the potential of this technology for writing simple and informative pieces but observe limitations at deeper levels of knowledge and in hybrid texts.

Keywords

Artificial Intelligence, education, journalism, journalistic writing, journalistic genres, University, ethics.

1. Introduction

The teaching of journalistic writing and genres is one of the pillars of journalism studies. Consequently, the *White Paper on Journalism Studies* recognises as a minimum educational content the theoretical and practical study of journalistic writing and oral forms through the different texts and genres in use (2005, p. 312). In practice, however, the different faculties integrate this objective into their curricula under different names and structures. Parrat (2015, p. 10) notes that this leadership is maintained over time despite the changes resulting from the technologization process of the profession and, more recently, from the requirements of adapting to the Bologna Plan that have not introduced substantial modifications that could affect the teaching of genres. Therefore, it can be said that they continue to be one of the fundamental pillars on which the study of journalism is based in Spain.

In the early days of journalism didactics, the first purely practical subjects in the old degrees were based on journalistic genres, basically on the binary conception (dualistic perspective) of the functions of journalism: reporting facts (stories) and commenting on these facts (comments). The journalistic genre is understood in relation to the function it fulfils, since it is a structural and stylistic response to the different expressive needs of people (Sánchez and López Pan, 1998, p. 17).

But long before the formalisation of journalism studies in universities, the importance of genres for teaching was noted in pioneering manuals such as Rafael Mainar's *El arte del periodista* (1906), which makes explicit references to genres (the difference between information, including reportage, *interviú* and commentary), or Salvador Minguijón's *Las luchas del periodismo* (1908), which includes the binary classification of information and opinion.

Within the framework of formal education, Parratt (2015, p. 20) highlights the contributions of Manuel Graña, who was sent by the director of *El Debate* to several American universities to broaden his knowledge by attending courses on journalistic topics. Upon his return, he published the book *La Escuela de Periodismo: programas y métodos* (1930), in which he even outlines the curriculum for a journalism school and identifies different journalistic genres, such as news, chronicles (informative or literary), and editorials, for which he warns that each would require a specialisation course.

Since the 1970s, perhaps due to their similarity to literary genres, which are typical of literary rules, journalism scholars have pointed to the existence of journalistic genres, which are undoubtedly useful in the field of teaching journalistic writing and training future information professionals, but also as a prior and essential operation in the research of information messages.

A decade earlier, in the academic year 1959-1960, the University of Navarre had already included a subject called 'Journalistic Writing' in the curriculum of the newly created Journalism Studies, accompanied by the statement 'Journalistic Genres', as Parratt (2015, p. 21) reports, while at the end of 1961, an edition of 'Journalistic Writing Class Notes (Journalistic Genres)' was published, drawn up by Professor Martínez Albertos with the idea of being used by second-year students at the Journalism Institute of the University of Navarre, and which distinguished the genres of information, report, chronicle, article and commentary, essential for the study of journalistic writing. In 1974, they became the handbook *Los estilos y los géneros en la prensa escrita* (Styles and Genres in Written Press) intended to be used by students of journalistic writing in different faculties.

However, the creation of the European Higher Education Area (EHEA) and the definitive integration of Spain into this system in the academic year 2010/11 meant, in the university sector, the application of a generally homogeneous educational policy open to student mobility between different universities in the European area. It also launched the process of the same name, which proposes to create a system of easily recognisable and comparable academic degrees, to promote the mobility of students, teachers, and researchers, to guarantee the quality of teaching, and to adopt a European dimension in higher education.

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According to Real Rodríguez (2012, p. 122), the curricula underwent various modifications in the first years until, after the testing period, they enjoyed greater stability. Humanes and Roses (2013, p. 182) point out that since most of the teaching staff came from other related fields of knowledge, such as Sociology, Philology, or Political Science, the first curricula prioritised theoretical content over practical content, while the renewal of the 1990s, which coincided with the creation of new faculties, allowed contents closer to professional practice.

In this respect, the curricula of the different faculties have evolved to be able to adapt to the dizzying changes in the media sector, increasing the number of subjects related to new technologies and digitalisation, while maintaining the importance of subjects related to the teaching of journalistic writing.

Similarly, the plans have been adapted to the key points of the university for the 21st century and to the objectives of the EHEA, which place the student at the centre of interest in the educational process and which imply the need to provide a preponderant role to active educational methodologies that promote a balance between the development of competences, the acquisition of knowledge, and the promotion of values and attitudes.

Most curricula also include a subdivision between the study of journalistic texts from a theoretical perspective, which is understood from a various terminology, as the study of journalistic genres and styles and their practical application, embodied in different Journalistic Writing subjects.

From its origins to the present day, the practical approach, which seeks to train students in the skill of writing through different modes of journalistic texts, has been a challenge for teachers specialised in this subject, especially with high ratio of students. In this respect, Moreno (1998) warns that the nature of a discipline such as journalistic writing imposes its conditions on the teaching model: the theoretical or practical emphasis or mixed dimension; the number of students; the timetables; and the materials and available resources to implement the processes.

In his doctoral thesis, Sanchís Cano (2019), who analyses the challenges of teaching journalistic writing, argues that professionals observe shortcomings in students' writing. In spite of that, they are critical of the training they currently receive at university, which, they argue, is far removed from real professional practice and with few options for practical writing exercises.

Most faculties propose for practical learning both the continuous reading and analysis of texts written by professionals and the writing and composition of informative, informative-interpretative, and opinion pieces of texts.

Doménech-Fabregat and López Rabadán (2012, p. 456) consider practical classes, unlike theoretical ones, as a space where students have a greater role and where they can develop an intense activity. They add that most of them consist of journalistic writing activities, where the maximum student participation as possible and in which the teacher carries out a task of advice, supervision and guidance, as well as continuous encouragement to ensure that students choose, promote their ingenuity and creativity in the search for solutions for each exercise. In this sense, it is not clear the impact that the use of AI can have both on the necessary learning of journalistic genres in university classrooms and on the variations that the different formats of journalistic language can adopt with the emergence of this type of tools. Although the possibilities of AI for journalistic writing have been studied (Túñez López, Toural Bran & Nogueira, 2019), the limitations that may exist to address journalistic genres that require a high level of creativity and complex narrative structures have been little researched.

1.1. *The Use of artificial intelligence in Journalism Education*

Apart from the execution of the exercises Bermeo Villa (2015) considers that in the teaching and learning process of journalistic writing, feedback acquires great relevance as a fundamental element of the evaluation process, understanding that it allows giving students immediate and timely information at the time of errors verification and to generate a space for thoughtful dialogue around the opportunities for improvement.

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Recent research attempts to analyse the possibilities of Artificial Intelligence in journalism education. The study by Gómez-Diago (2002) is pioneering in this regard. From an applied perspective, she analyses different international research projects and teaching experiences in the specific framework of journalism education, with the aim of contributing to the study of formulas for introducing AI into European journalism education. The author concludes that it would be necessary to train students in the possibilities of obtaining and processing data, creating automated content, and verifying content. The first two are directly related to journalistic writing. Also, Gómez-Diago warns that initiatives are still scarce in general and that the dynamics of the journalistic market itself demands the expansion of the curriculum in communication studies in Spain.

Other research also stresses the potential of this technology for journalistic automatic writing (Aramburú Moncada *et al*., 2023; Ufarte-Ruiz, Murcia-Verdú & Túñez-López, 2023; Franganillo, 2023; Ufarte Ruiz & Manfredi Sánchez, 2019; Fernández Barrero, 2021; Rojas Torrijos & Toural, 2019; Segarra-Saavedra & Cristòfol, 2019) and the fight against misinformation (Nucci, Boi & Magaldi, 2021; Manfredi Sánchez & Ufarte Ruiz, 2020; Flores Vivar, 2019; Buţincu & Alexandrescu, 2023). Túñez López, Toural Bran and Cacheiro Requeijo (2018) conducted a survey of Spanish journalists' professional associations, and the main results showed a profound lack of knowledge about the direct influence of AI on the profession. Journalists saw the direct application of artificial intelligence in the production of content as a change in the productive routines of the journalist, more than as an alteration of the entire news-making process in which the journalist disappears.

However, at the moment there is little research on the current use of AI for teaching purposes in specific areas of knowledge, as in this case, the teaching and learning of journalism in Spain; as well as on the possibilities and ethical conflicts that its different uses would generate, when, at the same time, its use in the professional field of journalism is beginning to be a palpable reality, highlighted by numerous authors, who detect a greater applicability in sectors whose tasks are more mechanical (Salazar, 2018, p. 304).

Also, there is currently no unanimity in academia on the benefits of applying AI tools to journalistic writing. Pavlik, for example, considers that "there are substantial limitations to the capabilities of AI, including its range and depth of knowledge [...] critically or creatively" (Pavlik, 2023). The authors demand further study of the potential and relevance of AI for journalism and media education (Pavlik, 2003), such as ChatGPT or DALL-E, and the possibilities for its incorporation into the curriculum and professional development (Luttrell, Wallace, and McCollough, 2020).

Gómez Diago (2022, p. 39) analyses, in a pioneering manner, perspectives and experiences to obtain ways to introduce AI in communication studies, specifically in journalism training, and concludes that they pose a triple challenge for university teaching: on an epistemological, theoretical, and deontological and pragmatic level. The author stands for promoting the view of the journalist as a content producer. From an applied perspective, she proposes teaching students to process data, to create content in an automated way, and to verify content. Also, she recognises that the academic and scientific field of communication, in its research and educational dimensions, is called to play an important role in the social sphere and considers that it is necessary to keep updating it.

Furthermore, Salgado (2022, p. 94) describes key elements to trace teaching trajectories in order to introduce AI into journalism curriculum, such as embracing different models of academic/industry cooperation; adopting a programme-wide AI literacy approach under the umbrella of computer science and the theoretical corpus; and acknowledging the generational position toward technology.

In an applied manner, there are different trends and strategies that seek to include AI in the educational programs and curricula of Spanish universities. In curricular designs, current developments include topics such as interdisciplinarity with computer science (Pérez, 2020);

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practical projects with the aim of solving real problems in journalism through AI (García Avilés, 2019), and a continuous effort to keep students updated with advances in AI through masters, workshops or seminars (Rodríguez Gómez, 2020).

The use of artificial intelligence is already palpable in professional journalism. Many media, especially those with greater resources, already use of this technology for different purposes, such as analysing volumes of data, automating news and assisting in the writing of content. Other functions include documentation, translation of texts, content verification, and grammar checking, among others (Zuboff, 2023; López- García, 2022; Tuñez-López, Fieiras-Ceide &Vas-Álvarez, 2021).

The development of applications is rapid, but at the same time, the debate about ethical and legal constraints is also intensifying. Those constraints affect, for example, the originality of text, intellectual property, or accuracy in specialised areas. In relation to intellectual property and copyright rights, Díaz-Noci (2020) studies the implications of IA by addressing the categories of authorship (and originality) and collaborative and collective works. He comments that although the work generated by AI should not be protected by Copyright without human intervention, it could be an extreme case "when artificial intelligence systems (AIS) are able to learn for themselves and create news autonomously," something that is not the most common situation in the media, as he explains. Beyond the intellectual property of AI-produced texts, Radsch (2024) has also extended the debate to the actual use of journalistic texts by AI programmes to develop and train generative artificial intelligence systems, a situation that has yet to be resolved, despite protests from the media industry and incipient agreements between AI companies and news publishers to access their content. Additionally, Ufarte-Ruiz, Calvo Rubio and Murcia Verdú (2021) stress that the challenges of using AI include guaranteeing people's privacy and intimacy, contrasting the information produced with AI, training information professionals in its use and application, promoting transparency in its use, detecting and controlling the biases of the algorithm, and not losing sight of the sense of commitment and social responsibility of journalism, among other issues.

In 2024, the European Union approved the first legal framework on AI, aiming to regulate the development, implementation, and use of artificial intelligence within its territory. This pioneering law in the field seeks to promote reliable AI by ensuring that its systems respect fundamental human rights, safety, and ethical principles. It also addresses the risks of highly powerful and impactful AI models, which have been categorized into four risk levels: minimal, limited, high, and unacceptable. High-risk systems will be subject to stricter regulations, including rigorous assessments before being introduced to the market (European Commission, 2024).

Within this new and pioneer regulatory framework of AI, the European Union advocates in an implicit manner for an ethical use of AI: control of quality of journalism, mitigation of fake news, privacy concerns or technology dependence are some of them that require specific formation and can be introduced in early stages of the journalism career (Carlson & Usher, 2024).

In this context, the question arises of what use AI is currently being made of AI in the university, specifically in the training phase of future journalists and in the teaching and learning of Journalistic Writing.

2. Purposes

The general purpose of the present research is to study the current use of AI in the teaching and learning process of journalism writing in Spain, in the university context, one of the key subjects in the training of future journalists.

In this subject, required in journalism study programmes at the main Spanish universities, students develop writing skills and learn to adapt their writing to different contexts and audiences through the possibilities offered by journalistic genres. The paper starts from the hypothesis of the importance that AI can play in this specific training of future journalists, in aspects such as automated data processing, content automation, grammatical correction or

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content personalization, and taking into account the ethical concerns or limitations pointed out by the literature, it tries to identify possible concrete uses that benefit the learning of writing and limitations.

Likewise, this article aims to analyze the level of acceptance of IA in the university context and the possibilities of integration into current teaching and learning models.

This general purpose is articulated in the following specific objectives: to analyse the level of knowledge of AI among students and teachers specialised in this subject in different Spanish universities; to investigate the predominant uses of AI applications by students and teachers in this university context; to explore the possibilities of IA for Journalistic Writing; to examine the possibilities of AI for writing different types of journalistic texts and the quality of the result; to describe the limitations for writing and composing texts; and to identify the challenges of AI for its integration in the teaching and learning process of journalistic writing.

In addition, the article provides an extensive bibliography of the latest research that has been carried out connected to AI and the contribution that it should offer within the teaching of journalism in Spanish universities.

2.1. *Methodology and procedures*

In line with the objectives set out, a review of scientific articles, books and reports, which deal with the configuration of the teaching of Journalistic Writing in the university context and the social impact of technology in general, and AI and robotics in particular, was carried out. The identification and collection of academic documents has been carried out following a methodology of systematised review (Codina, 2017), which has allowed us to define the state of the art around the objectives set and to design the questionnaires. The search process for texts was carried out using Google Scholar, a free bibliographic search engine, entering the keywords "journalistic writing," "journalism" and "artificial intelligence," as well as the combinations "journalistic writing" and "teaching" and "journalistic writing" and "artificial intelligence," trying to prioritize documents published in the last 10 years in terms of relevance and impact, and trying to offer a cumulative view of the state of the art in the field of AI and journalistic writing.

In addition, the research has followed a mixed methodology: On the one hand, a quantitative, descriptive, and comparative study has been carried out, based on surveys to university lecturers specialising in journalistic writing and students who are attending or have passed this subject in their studies, in order to investigate the current journalistic use of AI in both teaching and learning process, as well as specific applications. The questions also aimed to explore the ethical implications of using AI for journalism, as well as pragmatic challenges.

Specifically, two online questionnaires were carried out following a simple random sampling (Eiroa & Barranquero, 2017, p. 44):

$$n = \frac{Z^2\sigma^2}{e^2} \qquad (1)$$

Being n the size of the sample, Z the value of the normal standard distribution, σ the standard deviation, and e the error margin.

The first one was aimed at lecturers who have taught Journalistic Writing in different Spanish universities, with a sample integrated by 15 lecturers, and designed from the perspective of teaching.

The lecturers teach at the Universidad Complutense de Madrid, Universidad de Castilla La Mancha, Universidad Autónoma de Barcelona, Universidad de Sevilla, Universidad del País Vasco and Universidad de Málaga, and it has been chosen to anonymise the sources in order to favour freedom of response and encourage their collaboration, so that they would feel comfortable sharing information that, in case their identity were revealed, could stigmatise or compromise them in their professional teaching practice.

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The second one, aimed at students who are attending or have passed the subject Journalistic Writing, designed in this case from the perspective of learning, with a sample integrated by 52 students from the Faculty of Communication at the University of Seville. Both questionnaires were prepared using the Google Forms tool and evaluated before being applied and disseminated throughout 2023.

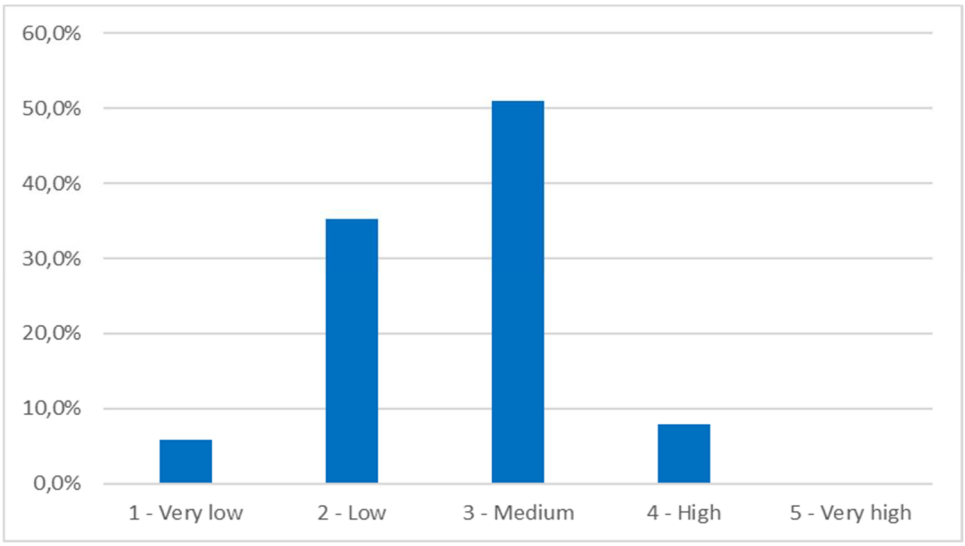
Likewise, the methodology is completed with an experimental research among professors specialised in Journalistic Writing from different universities, which has consisted of a proposal to correct, anonymously, a Journalistic Writing exam whose answers have been solved with Artificial Intelligence applications, specifically ChatGPT, in order to assess how experts in journalistic writing perceive the quality of the texts produced with AI, as well as the level of confidence that AI offers to theoretical-practical questions related to this subject. After the weighting of the results, each of them was interviewed in depth about the quality of the texts and their strengths and weaknesses.

3. Findings

3.1. *Students' Perception of the Use of AI*

Surveys among students show that the most frequent level of AI knowledge reported by them is 3 (medium), ranging from 1 (very low) to 5 (very high). 5.9% of the respondents have a low level of knowledge (equivalent to 1) and 7.8% have a rather high level of knowledge (equivalent to 4). No one of the students considers that he has a high level of knowledge of IA.

Figure 1. Level of knowledge of students of AI tools.



Source: Own elaboration.

The AI resources and applications related to IA they use the most are ChatGPT (96.1%), followed by Google News Lab (27.5%). Although Google News Lab is not an AI application per se, it has been included in the questionnaire because it is an initiative that collaborates with journalists and uses AI techniques for real-time analysis to organise information and present it effectively. It also collaborates with fact-checking organisations, which typically use natural language processing (NLP) algorithms. 15.7% of the students admit to using Grammarly writing assistant (Figure 2), which is not a complete AI writing tool either, but is considered a valuable tool for journalists to improve their writing style automatically using natural language processing (NLP) algorithms. In any case, this knowledge is almost self-taught, as 97.4% confess that they have not received any kind of training in this area.

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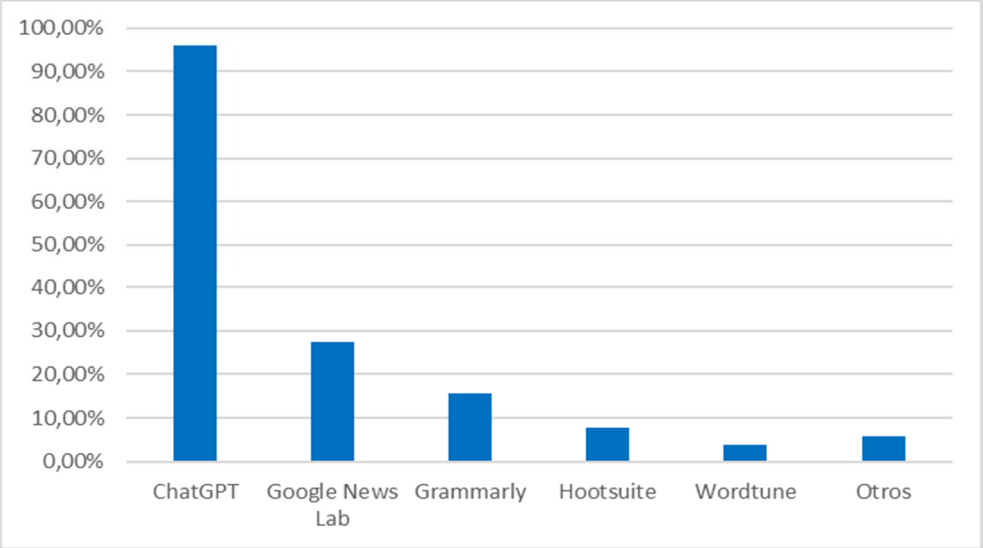
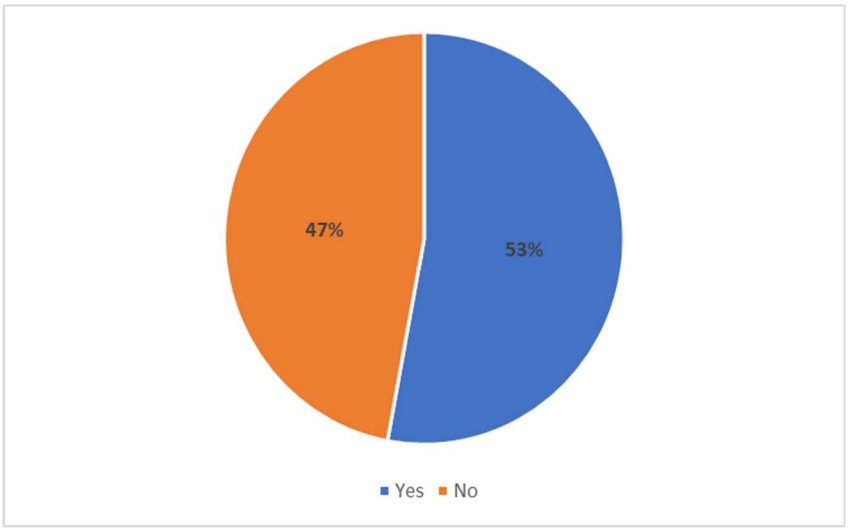
Figure 2. What AI tools are the students familiar with?



Source: Own elaboration.

In terms of automatic content generation, more than half of the students, 53% (Figure 3), claim to have used tools or software that make use of AI for the generation of written content or text editing in their academic work.

Figure 3. Use of AI tools for the generation of written texts or the creation of text by students in the elaboration of academic works.



Source: Own elaboration.

The tools they mention for this function are ChatGPT as a text generator, to supplement manually written texts, to search for documentation on specific topics, to summarise texts in PDF to generate indexes; Grammarly, to improve the writing of texts; and Monica and Bard, as writing assistants.

The vast majority of students use AI to search for topics of interest (49.0%), a use followed by other utilities such as writing documentation (43.1%), data collection and analysis (35.3%) and automatic text generation (35.3%). Other minority functions covered are language translation of texts (23.6%), speech-to-text transcription (23.1%), opinion research on current affairs (21.6%), grammar correction of texts (19.6%) and headline suggestion (25.49%).

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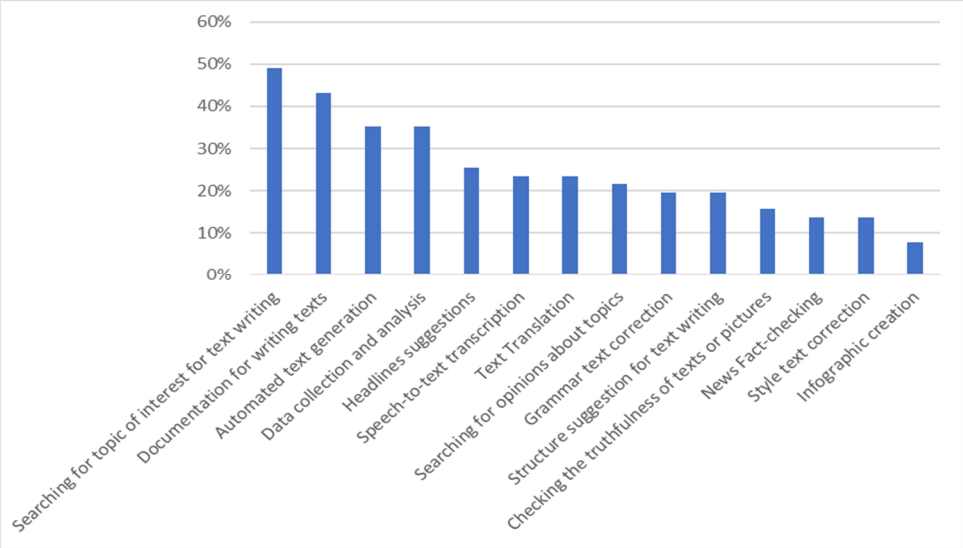
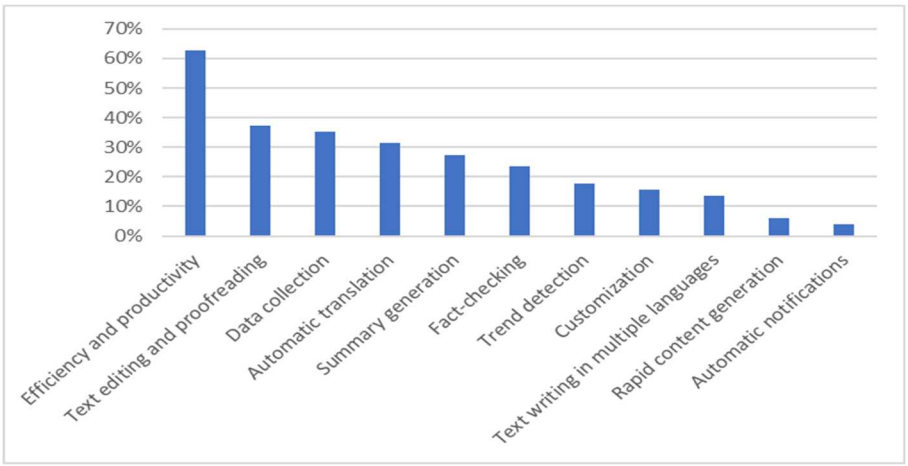
Figure 4. Purpose of the use of AI tools.



Source: Own elaboration.

In relation to the potential benefits offered by AI, respondents are overwhelmingly in favour of efficiency and productivity, as it can automate repetitive tasks, such as generating reports, news summaries, and transcripts. These uses allow journalists to save time and focus on research and creating higher value content (61.5%). This function is followed by data collection, at 35.9% (AI can help journalists collect and analyse large amounts of data efficiently, which is essential for in-depth research and reporting on complex topics) and automated translation, at 35.9% (AI-based translation tools allow journalists to access information in multiple languages and extend their reach globally).

Figure 5. Advantages of AI for journalistic writing.



Source: Own elaboration.

Respondents also perceive some challenges and concerns in relation to the use of Artificial Intelligence in journalistic writing. The majority (69.2%) consider that it raises conflicts over the authorship of texts; the reduction of the journalist's creative capacity (61.5%) and the possible destruction of jobs (61.5%). Students also observe other risks, such as the proliferation of fake news (61.3%). A large majority (84.6%) consider that readers should be warned about the use of AI in texts that use AI to a greater or lesser extent. In their opinion, this is an essential ethical principle.

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As to whether or not the generation of news with AI is ethical, students who are attending or have passed Journalistic Writing are divided: 51.3% do not consider it unethical, while 20.5% do. However, 28.2% of the respondents do not have a concrete opinion on the matter. However, 48.7% agree with the use of AI at some point in the journalistic production process.

In this context in which AI is beginning to be palpable in professional practice, 84.6% of the students believe that journalists still have a significant role to play and rule out the possibility of AI replacing journalists in the near future.

Regarding the possibility of teachers using AI for the correction of Journalistic Writing tasks, the majority of students disagreed, with values between 1 (23.1%, strongly disagree) and 2 (43.6%, disagree). Regarding its use for the design of exercises and exams in journalistic writing, the disagreement is not as strong as in the previous case, but it is still the trend (43.6% disagree; 20.5% completely disagree).

3.2. *Teachers' knowledge and opinion on AI*

On the other hand, the teacher survey reveals that 43.8% currently have medium knowledge of AI applications and 18.8% medium-high, while 19.3% report low and medium-low knowledge of AI. Only 6.3% of the respondents claim to have advanced knowledge of AI. Most teachers have not received specific training in AI, and those who have, 81.3%, have received it through courses outside the university or even self-taught. This data could explain why only 12.5% have incorporated Artificial Intelligence in their teaching methodology for Journalistic Writing.

With reference to software applications and tools associated to AI with journalistic capabilities, a large majority are favourably inclined toward Chat GPT (87.5%). Other widely used applications and resources are Hootsuite, a social media management software (56.3%); Google News Lab (43.8%), an initiative to combat misinformation; and Grammarly (41.35%), a writing assistant. Hootsuite itself is not an AI tool, but it incorporates AI features to enhance social media management (it offers a free AI caption generator for social media). Also, Grammarly is not a complete AI writing tool, but uses natural language processing (NLP) algorithms.

The teachers who have incorporated AI into their methodology for teaching Journalistic Writing have applied two types of activities: on the one hand, they have carried out comparisons of texts produced by artificial intelligence and human journalists, so that students can check the contribution of the journalist versus the machine; on the other hand, some students have carried out work in which they have chosen an AI tool and have shown it in a class presentation.

Regarding the uses and utility of AI, the vast majority of teachers have used AI for the idiomatic translation of texts (62.5%) and documentation on topics of interest related to the subject of the curricula (62.5%). They have also used it to check the veracity of texts (50%). Other functions, although with fewer uses, were assistance in designing exercises (25%), updating teachers' methodological knowledge (25%), familiarising students with the use of AI (25%) and transcribing speech to text (18.8%). Other uses such as designing personalised learning content (12.5%), updating teachers' theoretical knowledge (12.5%), collecting and analysing data (12.5%), designing tests or exams (6.3%), correcting tests and/or exercises (6.3%), and detecting the most common errors among students (6.3%) are also registered and used in a very small minority of cases. No teacher acknowledges using it to mark tests, detecting learning problems, or remotely monitor student progress.

Furthermore, 87.5% of teachers believe that the use of AI in the classroom can improve student motivation. Regarding advantages and benefits, teachers precisely highlight student motivation. They also value the students' contact with one of the future lines for journalism and the approach to the world of students and the universe of new technologies that surrounds us.

Those who do not rely on this motivational element have reservations about the use of this technology for learning to write, and even consider that the fact that the students undervalue the need for the human element in writing may be counterproductive. Also, they consider that the level of development is low and that the texts offered are inaccurate and even seriously confusing.

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Those who trust in its possibilities for learning journalistic writing perceive its usefulness for identifying and assimilating lexical, syntactic, and structural patterns of the news; for being able to write from an initial text proposal that serves as an inspiration point; for detecting common errors of style, grammar, and punctuation; to obtain immediate feedback on grammar, style, and structure of the text, as well as style appropriate to target audiences and contexts, in order to improve expression; to find correct and incorrect texts in order to compare styles; to detect marks of journalistic quality; to document and search for data on specific topics.

In general, teachers also see possibilities for teaching in the design of exercises to be carried out in class; the development of new methodological approaches, such as the creation of evaluation rubrics; the rapprochement to students and their technological context; facilitating the correction of activities; the suggestion of topics, translations options, grammatical and style corrections, lists of frequent errors to improve writing and linguistic skills; the automation of repetitive tasks, such as the creation of Newsletters; the contribution to the creation of podcasts with sound elements; the assistance in the creation of infographics; documentation for the creation of teaching materials and presentations.

In terms of limitations, the surveys show the long way to go in the field of AI or the technical shortage in universities, both in software and hardware. Professors highlight, for example, the low level of updating of programmes such as Chat GPT; the difficulties in producing journalistic texts that follow the parameters of genres in which the creative element is important, such as the chronicle, the report, or the column, while there are great advances in the handling of large amounts of data. Some teachers call this shortcoming "low rhetorical flexibility." Professors agree that the texts offered by AI should be taken as initial proposals to be filtered and supervised by a journalist and that automation should be enriched by human creativity.

They also perceive a need to draw ethical guidelines for declaring the use of AI in order to avoid plagiarism and automatism, as well as a need to expand teachers training on the usefulness of AI for education in general and journalistic writing in particular.

Teachers' fears point to the possibility of students abusing this tool, in such a way that creativity could be sacrificed and automatism would have a negative impact on the learning and performance of skills and abilities necessary to carry out the work accurately and correctly; the improper use of sources and images, without proper citation; the inclusion of data provided that have not followed a rigorous verification process, which would result in the assimilation of a work system that does not comply with an ethical process of review and control; the inclusion of erroneous and/or biased data that are assumed to be truthful, with the consequent contribution to the circulation of hoaxes; the belief that the information provided by the AI is correct and a-ideological; the loss of identity of manual journalistic work and the early assimilation of a possible substitution of the journalist by an automated system that can lead to the demotivation of students and the demystification of the figure of the journalist and his or her role for social change; the difficulty of differentiating the real from the fake; the conformity with the delivery of work that does not meet adequate quality parameters, etc.

Teachers are unanimous on the need to introduce ethical codes that ensure responsible use of AI by teachers and students, that set out the conditions and limitations of AI use, encourage transparency in authorship issues, promote proper attribution of citations and the use of other sources to avoid plagiarism, and encourage the role of the journalist in the production of the journalistic product.

3.3. *Automated news reporting under scrutiny*

From the perspective of journalism education, experimental research among teachers specialising in journalism writing reveals some limitations of AI. In fact, AI fails the proposed Journalism Writing exam with a high mark. Only one of them claims that the test is moderately correct. The comments written by the teachers in the correction allow us to outline some of the possibilities and challenges.

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The test shows that AI perfectionism leads the chat to offer different alternatives, so that teachers perceive that the questions must refine the precision of the exam question to limit the results of the answer. Thus, in the first exercise, which asks the students to write an informative title for the set of data offered in a news lead and for which the chat offers three moderately correct alternatives, the teachers point out the need to limit the number of words that the student can use in the answer. This would avoid long headlines such as the one AI offers as the third alternative: "Cristina Peláez, portavoz de Vox en el Ayuntamiento de Sevilla, hace un llamamiento urgente a tomar medidas contra las bandas juveniles que actúan en zonas de botellón" (Cristina Peláez, Vox spokesperson on the Seville City Council, makes an urgent call to take measures against youth gangs that act in areas of drinking alcohol). In this respect, one of the teachers specifies that a correct informative headline would remove the proper name in the title and the preference for the institutional position in order not to exceed the number of words.

In the second exam question, which asked for editorial and stylistic corrections to be made to a proposed informative text, the corrections show that the answers given did not reach the appropriate level of journalistic specialisation, as the IA ignores some of the rules that students learn throughout the course for writing informative texts. For example, the different corrections show mistakes in the use of quotation marks, which should be reserved for direct speech or for marking key words in reported speech. Errors are also detected in the concordance of quotations in reported speech: "The President of the United States has stated in a televised speech that 'the decisions we make today will determine the decades to come'" ("El Presidente de los Estados Unidos ha afirmado en un discurso televisado que 'las decisiones que tomemos hoy determinarán las décadas venideras'"); in the correct placement of quotation marks in statements in direct style; the defective placement of quotation marks in direct speech; the use of capital letters after the colon, to introduce a direct quotation; the use of words to express numbers from one to nine; the translation of Latinisms that should appear in Latin (the AI translate the Latin expression *in extremis* into Spanish as "in extremo"); the unnecessary rounding of figures in the title (billions) when a closed amount is addressed (70 000 million); the use of the past perfect tense in the body of the text instead of the immediacy of the past perfect simple; the correct quotes (sometimes they are not attributed); the absence of connectors between paragraphs to link ideas; and key data concentrated in the last paragraph of the text that should be included in the first one.

The accuracy of the AI leads the algorithms to continuously introduce one of the five Ws, the interrogative who of the news item, as "The President of the United States, Joe Biden," when journalistic style recommends that once designated in that way, the journalist does not have to make use of the binomial name and organisational title of the correspondent. Also, alternative resources are available to designate him/her, so that when first names, surnames, and titles are indicated in subsequent paragraphs, it would be considered a failure of reiteration. Something similar occurs with the use of the verb 'warn', which is very reiterative, despite the existence of many synonyms. In general, teachers observe the writing style as "somewhat cold," correct in terms of spelling and grammatical construction, but too hermetic, and with errors attending to journalistic style (for example, in the use of upper- and lower-case letters).

The third exercise, an applied theory question, asks one to catalogue the type of headline offered in an example text and to classify the specific journalistic genre. The answer given by IA classifies it as an informative headline and, more specifically, attributes it to a news item, also justifying the answer. Some teachers have pointed out that this last precision would be wrong, as the headline is interpretative, so it could be either an interpretative news item, with a hybrid nature, or a highly informative political chronicle. In this way, when faced with theoretical-practical questions that require a high level of specialisation in journalistic knowledge, AI does not provide the desired answers, for example, when informative paragraphs are combined with interpretative paragraphs, whose dynamic no longer responds to a reiterative and mechanical logic.

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The fourth question asks students to identify six types of headlines that cover a wide variety of genres. Teachers perceive mistakes at a deeper level of the content. For example, the title "Padel leaves behind its elitist past" ("El pádel deja atrás su pasado elitista") could indeed be informative, but not specifically for a news item, as the AI indicates, but for a report, because of the interpretative elements. Thus, the AI again fails to perceive the subtle nuances that separate information from interpretation. The second (title of an interview) and third (title of a news item) provide the correct answers. The titles of both genres have a very precise composition rule. In the fourth title, the AI correctly classifies it as an opinion genre but does not indicate the specific modality. The fifth one ("Antigitanismo") classifies it as an interpretative genre, ignoring a key characteristic of opinion texts. They are presented in italics. Moreover, it does not attempt to specify what kind of opinion text could be. The sixth, "Venezuela openness cannot be a blank cheque for Chavismo" ("La apertura a Venezuela no puede ser un cheque en blanco al chavismo") is also classified as an opinion piece, specifically an article. Teachers rule out this possibility and warn that this title shows an editorial line and an ideological approach on a current international issue, and, therefore, it would correspond to the title of an editorial article.

In the fifth exercise, AI is asked to carry out a creative task consisting of finishing an uncompleted opinion column and titled it. In the paragraph written with AI, the algorithm repeats a stylistic device located on the first paragraph, the repetition of the phrase "What will happen?," like a chorus, imitating this stylistic feature. When assessing the content, teachers consider that it does not contribute anything new. Furthermore, they do not support the headline written with IA, "The future, an imminent catastrophe" ("El futuro, una catástrofe inminente"), as they understand that the main idea of the text is the feeling of uncertainty. They consider that the headline should emphasise this idea.

Finally, in the last exercise, which asks to classify a text, the AI indicates that it is an opinion genre, reflecting on the sense of future and how this feeling has changed over time. The AI programme perceives the stylistic feature of repetition. Teachers consider this answer to be insufficient because it does not go into the specific type of opinion genre. They observe that the literary style, the brevity, the presentation of opinions without going too deeply into the argument or the use of a chorus are clearly perceptible features which should undoubtedly lead to an opinion personal column, an aspect which the IA is unable to perceive.

4. Conclusions

Although the use of Artificial Intelligence is already palpable in the professional journalistic field, the use of applications among Journalism students, in the Spanish University context, is limited for the moment. The scope of the survey carried out among Journalistic Writing students at the University of Seville shows that the most frequent level of AI knowledge reported by them is medium. However, they use it primarily for mechanical and parameterized tasks, such as automatic content generation, data analysis, documentation, or text translation. Its use declines when it comes to performing creative tasks, such as writing news headlines or advanced editorial tasks.

Its practice is highly concentrated in ChatGPT, so AI is commonly associated with this software tool for text generation, documentation, and content extension, which is evidence that students have a superficial knowledge of this emerging technology.

This concentration on a few tools could be, in part, a consequence of the lack of training reported by this group. A greater educational offer in this field would allow a more efficient use of AI and all the possibilities it offers, improving it and optimising the development of their tasks. So, education could play a significant role in this regard, showing future journalists the utilities and innovations introduced by AI when writing a journalistic text or producing audiovisual content, from an enriching perspective. Furthermore, as Luttrell, Wallace and McCollough (2020) point out, the generalisation of the use of this technology in the professional

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field urges the introduction of its use in teaching, so that not only future professionals are trained efficiently, but also from an ethical perspective.

Although it is a novel technology, it is widely known by students in this sample and is perceived as a tool that generates benefits in terms of efficiency and productivity, in particular in the field of journalism, although they recognise, in line with the results of the specialized bibliography, the underlying dangers related to personal and professional ethic, especially with regard to authorship and originality of content, or the impact on the job market, although they believe that the role of the journalist is for the moment hardly replaceable.

The study shows that while students at the University of Seville consider legitimate AI resources, as it facilitates their tasks and improves their productivity, they are not in favour of AI supervising their work or being used as a tool for marking or designing exams, so that implicitly underlies a negative view of the use of Artificial Intelligence in the university environment.

On the other hand, research evidence shows that AI has important practical limitations for journalistic writing, especially regarding automated writing and creative texts. In the opinion of most of the teachers interviewed, AI fails the Journalistic Writing test proposed as an experiment in this research work. In relation to writing tasks, AI requires a great deal of concreteness and precision in the questions asked to obtain precise and concrete answers. The examination carried out by AI shows a lack of specialisation which prevents it from identifying and applying very specialised features in specific journalistic genres. There are also some grammatical and stylistic errors in the writing function, and the results are less effective in texts that require some creativity.

It should be noted that neither teachers nor students included in this study have received formal training in AI applications, a factor that limits the development and applicability of AI in the teaching and learning process. Considering that this is a constantly evolving technology, there is also a need to improve teacher training.

However, future possibilities are on the horizon, especially as a support tool for teachers in the classroom, who must supervise any process carried out with this technology from the beginning to end, ensuring its responsible and ethical use. At the same time, the capabilities of AI need to be refined and cleaned up, considering the limitations mentioned above.

The present text is a starting point for research, concentrated in a specific context, to learn how AI is being used among journalism students, what perspectives professors have on its incorporation into the curriculum and how to improve the training of future journalists using IA tools and applications. The next research step could be to investigate a wider sample of students and teaching staff to offer a more accurate picture of the use and presence of AI in the university context, bearing in mind that it is a phenomenon in constant development.

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