



Generative Artificial Intelligence in Healthcare Education; Challenges and Ethical Issues

Inteligencia Artificial Generativa en la educación sanitaria; retos y cuestiones éticas

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ABSTRACT

The integration of Generative Artificial Intelligence into education is reshaping teaching and learning practices, creating an urgent need for regulatory and verification policies. In health-related university programs, these challenges are amplified because inaccurate information may lead to potential diagnostic and treatment errors. To examine the official AI policies of Spanish universities and assess the accuracy of ChatGPT 3.5 outcomes. Comparative study. Although university policies promote transparency and responsible use, they lack mandatory mechanisms to ensure systematic verification of information generated by AI tools. The study highlights the need for administrative policies that embed critical verification models within the curriculum, ensuring that the use of artificial intelligence reliably strengthens—rather than jeopardizes—the quality, safety, and academic rigor of university education, with relevance for healthcare training.

RESUMEN

La integración de la Inteligencia Artificial Generativa en la educación está transformando los procesos de enseñanza y aprendizaje, exigiendo políticas de regulación, pero también de verificación. En la formación universitaria sanitaria, estos retos se intensifican, ya que la inexactitud de la información puede derivar en posibles errores diagnósticos y de tratamiento. Analizar las políticas de las universidades españolas sobre inteligencia artificial y evaluar la precisión de las respuestas de ChatGPT 3.5. Estudio comparativo. Aunque las políticas universitarias fomentan la transparencia y el uso responsable, no establecen mecanismos obligatorios que garanticen la verificación sistemática de los datos generados por herramientas de inteligencia artificial. Este estudio destaca la necesidad de desarrollar políticas administrativas que incorporen modelos de verificación crítica en los planes de estudio, asegurando que la inteligencia artificial complemente de forma fiable la calidad, seguridad y rigor de la formación universitaria, especialmente en el ámbito sanitario.

KEYWORDS | PALABRAS CLAVE

Artificial Intelligence, Higher Education, Health Education, Educational Quality, Ethics
Inteligencia Artificial, Educación Superior, Educación sanitaria, Calidad educativa, Ética.

1. Introducción

Generative Artificial intelligence (GAI) is revolutionizing various sectors, and education is no exception. The integration of generative AI in education is transforming traditional teaching methods and enhancing the learning experience for students globally. This technological advancement may improve academic performance by personalized experiences. One of the most significant uses of generative GAI in education is personalized assessment and learning, since GAI algorithms analyze individual students' strengths, weaknesses, and learning styles to provide feedback and create customized learning paths (Crompton & Burke, 2023).

Other GAI-related uses are related to grading and evaluation of papers and exams through image recognition and prediction systems; personalized intelligent teaching, through data mining and learning analytics; and online and mobile remote education, through edge computing, virtual personalized assistants and real-time analysis (Crompton & Burke, 2023; Zawacki-Richter et al., 2019). The proper use of GAI in academic education enhances the quality of education and ensures that each student can progress at their own pace with personalized experiences (Lin et al., 2023).

With the focus on healthcare education, the use of GAI relies heavily on the accuracy of the information provided. The role of GAI in healthcare education encompasses, among other activities, personalized learning pathways, simulation-based learning and clinical decision. But if the training programs and prediction models use incomplete data, this can lead to biased decisions (Abdullayev et al., 2025). Thus, inaccurate information can lead to misdiagnosis, which can harm patients. It is therefore essential to ensure that GAI systems are truthful, well-designed and reliable (Reddy, 2024). However, due to the rapid progress of models the verification of information becomes a huge task, and the recognized challenges regarding the accuracy and reliability of GAI in high-stakes fields, particularly in healthcare education, necessitate focused research into its practical implementation and verification of performance, to minimize the risk of misdiagnosis. For this reason, this study aims to first benchmark institutional responses to these technological changes by examining the public policies adopted by Spanish universities, and second, to evaluate the precision of GAI outputs (using ChatGPT 3.5) to understand how task complexity impacts information veracity.

1.2. Literature Review and Theoretical Framework

There is no specific legislation on GAI in Spain, but the National Artificial Intelligence Strategy 2020-2025 stands out as the main framework for promoting AI research and development in our country (OECD, 2019; Ruiz-Lázaro et al., 2025). In the same line, the Conference of Rectors of Spanish Universities (CRUE) points out that universities must lead the use of GAI, ensuring ethical and equitable use (Cruz Argudo et al., 2024). Sustainable education encompasses inclusive education, which highlights the key role of technology education in raising awareness of environmental sustainability and empowering people. In this line, technology offers the opportunity to teach more effectively, improving accessibility, making learning more inclusive for students with special needs, and translating educational materials into multiple languages, breaking down language barriers and promoting global education equity (Iku-Silan et al., 2023). Generalizing the use of GAI in higher education would be possible by promoting the implementation of different systems, such as the Intelligence Tutoring Systems (ITS) (Feng et al., 2021) or chatbots platforms (Iku-Silan et al., 2023; Jeon et al., 2023).

These systems originated in the 1960s, but moderns ones allow more effective interaction and they are becoming very popular in a wide variety of areas of society, including education (Welskop, 2023). Intelligent tutoring systems (ITS) are generally defined as a computer learning environment that enhances the students' knowledge by artificial algorithms, with one-to-one tutoring, giving instant feedback, answering questions and providing additional resources for further learning. Different types are available, such as AutoTutor, which uses natural language to teach students subjects such as physics, or LabTutor for engineering students (Feng et al., 2021; Lin et al., 2023). Chatbots use natural language processing, machine learning and deep learning to simulate human conversation, and are equipped with an easy-to-use interface, as well as storage and feedback features that allow individualized guidance in learning. A large number of these platforms are available to deploy chatbots, such as Google's DialogFlow, Microsoft Bot Framework, ChatGPT or PandoraBots, and are used in different sectors such as health, office work, customer service and education (Følstad et al., 2021).

In the field of education chatbot key components are related to goal-orientation, embodiment, and multimodality, as well as feedback, thus providing a useful tool for promoting the interdisciplinary learning in the academic community (Jeon et al., 2023). Specifically, the use of ChatGPT is emerging as a new technology to empower students to take control of their learning experience and academic goals. Introducing ChatGPT as a learning tool can encourage students to think critically about the wider societal, ethical, legal and moral issues associated with the integration of GAI (Castonguay et al., 2023; Tam et al., 2023).

Although the benefits and the potential opportunities of using GAI, some concerns arise concerning risks on trustful information derived from GAI outputs (Walker, 2025; Zawacki-Richter et al., 2019). In this regard, Martín-Moncunill and Alonso Martínez (2025), highlighted the lack of trust in GAI assistants and the lack on inadequate verification methods among engineering and social science students. With the focus on healthcare education, a recent study with medical students conducted by Lyman et al. (2025) supported these findings, highlighting that most of participants reported disadvantages of GAI uses. These disadvantages included errors and inaccuracy, and the tendency of GAI to provide incorrect or incomplete information, undermining its reliability. Consequently, a need for clearer institutional guidelines verification in academic settings is urgently required.

2. Method

2.1. Research Design and Rationale

A comparative study designed to address the documented lack of regulation and quality assurance of generative artificial intelligence (GAI) in higher education, particularly regarding verification recommendations and instructions set out in policies.

2.2. Objectives

To evaluate the accuracy of ChatGPT-3.5 responses.

To examine the official university policies on generative AI in Spanish universities.

2.3. Data Sources and Sampling

Policy Corpus.

A corpus of official institutional documents of GAI policies publicly accessible from Spanish universities offering different degrees were collected. Documents were selected if they explicitly addressed generative artificial intelligence, academic integrity, digital tools, or guidelines for student use of AI-assisted technologies.

ChatGPT-3.5 outcomes.

A dataset of responses was generated by submitting educational prompts to ChatGPT-3.5.

3. Results

3.1. Chat GPT outcomes

The study demonstrates a practical example of inaccuracies of GPT in a simple manner. In this exercise the authors asked ChatGPT-4.0 for a list of all Spanish universities. In the first attempt, the list generated by ChatGpt 3.5 to the question: "Give me a list of all spanish universities" ["Dame una lista de todas las universidades españolas"], a total of 60 universities were listed, but the list was incomplete. For example, the Universitat Autònoma de Barcelona (UAB), the Universitat Oberta de Catalunya (UOC) and the Universidad Nacional a Distancia (UNED) were not included. (Table 1)

In the second attempt, ChatGpt 3.5 generated a list of 104 universities to the question: "I need a list of ALL spanish universities" ["Necesito una lista de TODAS las universidades españolas"], but again with errors. In this new list, the ChatGPT decides to divide universities into three sections: public, private and others. Some universities were duplicated and classified in two sections, such as the University of Zaragoza (UNIZAR) and the University Rovira i Virgili (URL), which were placed both in the public section and in the other universities section. Other specific errors concern to classification in the correct section. For example, the Universitat Internacional de Catalunya (UIC) was listed in the public section, although it is a private center. (Table 2)

Table 1: List of all Spanish Universities (first attempt).

1. Universidad de Alcalá	31. Universidad Politécnica de Cataluña
2. Universidad de Almería	32. Universidad Politécnica de Madrid
3. Universidad de Cádiz	33. Universidad Politécnica de Valencia
4. Universidad de Cantabria	34. Universidad Pompeu Fabra
5. Universidad de Castilla-La Mancha	35. Universidad Pública de Navarra
6. Universidad Complutense de Madrid	36. Universidad Rey Juan Carlos
7. Universidad de Córdoba	37. Universidad Rovira i Virgili
8. Universidad de Extremadura	38. Universidad de Vic
9. Universidad de Granada	39. Universidad Internacional de Andalucía
10. Universidad de Huelva	40. Universidad Internacional de Cataluña
11. Universidad de Jaén	41. Universidad Internacional de La Rioja
12. Universidad de La Laguna	42. Universidad Europea de Madrid
13. Universidad de Las Palmas de Gran Canaria	43. Universidad a Distancia de Madrid
14. Universidad de León	44. Universidad de Deusto
15. Universidad de Lleida	45. Universidad de San Jorge
16. Universidad de Málaga	46. Universidad Católica de Murcia
17. Universidad de Murcia	47. Universidad Francisco de Vitoria
18. Universidad de Oviedo	48. Universidad Nebrija
19. Universidad de Salamanca	49. Universidad CEU San Pablo
20. Universidad de Sevilla	50. Universidad Pontificia de Comillas
21. Universidad de Valencia	51. Universidad Pontificia de Salamanca
22. Universidad de Valladolid	52. Universidad Loyola Andalucía
23. Universidad de Zaragoza	53. Universidad Alfonso X el Sabio
24. Universidad de Alicante	54. Universidad Camilo José Cela
25. Universidad de Barcelona	55. Universidad Europea del Atlántico
26. Universidad de Girona	56. Universidad Internacional Menéndez Pelayo
27. Universidad de Navarra	57. Universidad Cardenal Herrera-CEU
28. Universidad de La Rioja	58. Universidad Abat Oliba CEU
29. Universidad del País Vasco	59. Universidad Católica de Valencia San Vicente Mártir
30. Universidad Politécnica de Cartagena	60. Universidad Internacional Isabel I de Castilla

Table 2: List of all Spanish Universities (second attempt).

Universidades Públicas (Public Universities)	Universidades Privadas: (Private universities)	Otras Universidades: (Other)
1. Universidad de Alcalá	1. Universidad Europea de Madrid	1. Universidad Autónoma de Barcelona
2. Universidad de Almería	2. Universidad a Distancia de Madrid	2. Universidad Autónoma de Madrid
3. Universidad de Cádiz	3. Universidad de Deusto	3. Universidad de La Laguna
4. Universidad de Cantabria	4. Universidad de San Jorge	4. Universidad de Las Palmas de Gran Canaria
5. Universidad de Castilla-La Mancha	5. Universidad Católica de Murcia	5. Universidad de Valladolid
6. Universidad Complutense de Madrid	6. Universidad Francisco de Vitoria	6. Universidad de Jaén
7. Universidad de Córdoba	7. Universidad Nebrija	7. Universidad Miguel Hernández de Elche
8. Universidad de Extremadura	8. Universidad CEU San Pablo	8. Universidad Rovira i Virgili
9. Universidad de Granada	9. Universidad Pontificia de Comillas	9. Universidad de Santiago de Compostela
10. Universidad de Huelva	10. Universidad Pontificia de Salamanca	10. Universidad de Vigo
11. Universidad de Jaén	11. Universidad Loyola Andalucía	11. Universidad de A Coruña
12. Universidad de La Laguna	12. Universidad Alfonso X el Sabio	12. Universidad de Extremadura
13. Universidad de Las Palmas de Gran Canaria	13. Universidad Camilo José Cela	13. Universidad de Zaragoza
14. Universidad de León	14. Universidad Europea del Atlántico	14. Universidad de Cantabria
15. Universidad de Lleida	15. Universidad Internacional Menéndez Pelayo	15. Universidad de Castilla-La Mancha
16. Universidad de Málaga	16. Universidad Cardenal Herrera-CEU	16. Universidad de Burgos
17. Universidad de Murcia		17. Universidad de León
18. Universidad de Oviedo		18. Universidad de Salamanca
19. Universidad de Salamanca		19. Universidad de Valladolid
20. Universidad de Sevilla		20. Universidad de Huelva
21. Universidad de Valencia		21. Universidad de Jaén
22. Universidad de Valladolid		22. Universidad de Sevilla
23. Universidad de Zaragoza		23. Universidad Pablo de Olavide
24. Universidad de Alicante		24. Universidad de Málaga
25. Universidad de Barcelona		25. Universidad de Granada
26. Universidad de Girona		26. Universidad de Almería
27. Universidad de Navarra (pública)		27. Universidad de Córdoba
28. Universidad de La Rioja		28. Universidad de Cádiz
29. Universidad del País Vasco		29. Universidad Politécnica de Madrid
30. Universidad Politécnica de Cartagena		30. Universidad de Alcalá
31. Universidad Politécnica de Cataluña		31. Universidad Carlos III de Madrid
32. Universidad Politécnica de Madrid		32. Universidad Complutense de Madrid

Table 2: List of all Spanish Universities (second attempt).

Universidades Públicas (Public Universities)	Universidades Privadas: (Private universities)	Otras Universidades: (Other)
33. Universidad Politécnica de Valencia 34. Universidad Pompeu Fabra 35. Universidad Pública de Navarra 36. Universidad Rey Juan Carlos 37. Universidad Rovira i Virgili 38. Universidad de Vic (pública-privada) 39. Universidad Internacional de Andalucía 40. Universidad Internacional de Cataluña 41. Universidad Internacional de La Rioja	17. Universidad Abat Oliba CEU 18. Universidad Católica de Valencia San Vicente Mártir 19. Universidad Internacional Isabel I de Castilla	33. Universidad Rey Juan Carlos 34. Universidad Politécnica de Cataluña 35. Universidad de Barcelona 36. Universidad de Girona 37. Universidad de Lleida 38. Universidad Autónoma de Madrid 39. Universidad Autónoma de Barcelona 40. Universidad Pompeu Fabra 41. Universidad de Vic 42. Universidad Internacional de Andalucía 43. Universidad Internacional de Cataluña 44. Universidad Internacional de La Rioja

3.2. Policies and recommendations

Across the institutions surveyed, a primary consensus emerges regarding the responsible and critical application of AI, advocating comprehensive training programs for both students and educators in ethical practices. A universal recommendation involves the development and implementation of clear policies that actively promote equitable access and opportunities in AI-assisted learning.

Table 3 shows where it is possible to find policies and recommendations for the use of GAI in academic works in each of universities visited, and Table 4 shows the ethical aspects, policies and recommendations to conduct academic works for each university explored.

Table 3: Websites for Policies and Recommendations for the Use of GAI.

Universidad Oberta de Catalunya (UOC)	https://biblioteca.uoc.edu/es/biblioguias/biblioguia/Inteligencia-artificial-en-la-docencia/?tab=1
Universidad Internacional de la Rioja (UNIR)	https://www.unir.net/wp-content/uploads/2024/02/Declaracion-UNIR-para-un-uso-etico-de-la-IA-en-Educacion-Superior.pdf
Universidad Autónoma de Madrid (UAM)	https://www.uam.es/uam/media/doc/1606941290988/guia-visual-iagen.pdf
Universidad de Granada (UG)	https://ceprud.ugr.es/formacion-tic/inteligencia-artificial
Universidad Carlos III de Madrid (UC3M)	https://e-archivo.uc3m.es/entities/publication/e560161f-44a3-43f5-9a4e-5175a052c2ec
Universitat Pompeu Fabra (UPF)	https://guiesbibtic.upf.edu/iag/docencia
Universitat de Lleida (UL)	https://adia.udl.cat/ca/com-fèr-anar-la-ia/alumnat/suport-enelsexercicis-i-activitats/
Universidad de Huelva (UHU)	https://www.uhu.es/sic/inteligencia-artificial/recomendaciones-y-recursos
Universitat Ramon Llull (URL)	https://www.url.edu/es/innovacion-docente-y-calidad/recomendaciones-para-el-buen-uso-de-las-herramientas-basadas-en-inteligencia-artificial
Universidad Politécnica de Madrid (UPM)	https://blogs.upm.es/observatoriogate/2024/03/04/el-uso-docente-de-la-inteligencia-artificial-en-la-educacion-universitaria/
Universidad de Cádiz (UCA)	https://medicina.uca.es/uso-adecuado-de-la-inteligencia-artificial-en-medicina/
Universitat Rovira i Virgili (URV)	https://docs.campusvirtual.urv.cat/wiki/IA_i_aprenentatge._Una_guia_per_1%E2%80%9999estudiant_URV
Universidad de Cantabria (UC)	https://web.unican.es/buc/recursos/guias-y-tutoriales/guia?g=214

Table 4: Ethical Aspects and Recommendations on University Graduates on the Use of AI.

Recommendations	UOC	UNIR	UAM	UG	UC3M	UPF	UL	UHU	URL	UPM	UCA	URV	UC
Developing policies that promote equal access and opportunity in													
Using IA responsibly and critically	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Training of students and teachers in the ethical use of AI is	✓	✓	✓	✓	✓								
Make use of AI to solve evaluation activities only in the permitted	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
All evaluation activities should explicitly state what types of uses of AI	✓	✓	✓	✓	✓	✓		✓		✓			
Identify the options of one of the AI in the statements of the	✓	✓						✓		✓			
Cite the tools used for the realization of assignments	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓
Identify the text or images generated by AI systems (traceability)	✓	✓				✓		✓	✓				✓

Table 4: Ethical Aspects and Recommendations on University Graduates on the Use of AI.

Recommendations	UOC	UNIR	UAM	UG	UC3M	UPF	UL	UHU	URL	UPM	UCA	URV	UC
Recommendation for making a critical review and verification of the	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
If AI has been used, ask students to indicate which verification													

Note: UOC Universitat Oberta de Catalunya; UNIR= Universidad Internacional de la Rioja; UAM = Universidad Autónoma de Madrid; UG= Universidad de Granada; UC3M Universidad Carlos III de Madrid; UPF = Universitat Pompeu Fabra; UL Universitat de Lleida; UHU Universidad de Huelva; URL= Universitat Ramón Llull; UPM Universidad Politécnica de Madrid; UCA= Universidad de Cádiz, Universidad de Cantabria. URV=Universitat Rovira i Virgili; UC

A crucial aspect of this regulatory landscape concerns the explicit management of GAI during evaluation activities. Institutions emphasize the need for clear guidelines, mandating that all assessment statements explicitly define permitted types of GAI usage (e.g., allowed with limitations, not allowed). Specific recommendations include requiring students to cite any GAI tools used in assignments and identifying GAI-generated text or images for traceability. However, a significant gap in policy is evident: none of the institutions surveyed have established standardized verification methods for AI output, instead merely recommending critical review and asking students which verification methods they have used. This structured approach, while fostering academic integrity, highlights the current institutional reliance on individual student discretion rather than mandated verification protocols.

4. Discussion

The use of GAI in higher education offers great opportunities for improving education and training. However, the findings suggest that the generalized use of GAI in different academic tasks and training programs should be carefully considered and reviewed. To promote the ethical use of GAI, administrators need to establish public policies and promote equal access and opportunity in education using these new technologies. However, the challenges and specific ethical and social issues in this area need to be carefully addressed.

In terms of policies, these should be standardized and generally implemented in higher education to minimize the risk of differences both in quality of education and academic performance, as Ruiz-Lázaro et al. (2025) suggested. In addition, these policies should include recommendations and specific tools to check for verification of GAI performance, due to the inaccuracy, errors and incomplete information provided for the GAI (Lyman et al., 2025; Martín-Moncunill & Alonso Martínez, 2025). As general recommendation, for using across different academic specialties, the GAI detection tool *GPTZero* would be useful. This tool has expanded its functionality to include Citations and Fact Checker. This mechanism is designed to track and verify a student's cited sources to identify potential source hallucination—the invention of non-existent references—thus bolstering academic integrity. Similarly, *JustDone* has been mentioned as a tool featuring an integrated fact-checker intended to assist in preventing these source-related hallucinations.

With the focus on healthcare education, it is important not to overlook that algorithms provide responses based on available information and do not have the capacity to discern whether this information is correct or incorrect. As a result, they may reach biased, limited or inaccurate conclusions. For instance, the most widespread use of GPT in healthcare is the academic writing, and some concerns are related to the 1) risk of incorrect information, 2) citation/reference inaccuracy, 3) restricted knowledge before 2021, 4) legal issues, 5) risk of misinformation, and 6) lack of originality (Sallam, 2023). In this academic context, specific tools to promote the verification of GAI performance have been developed and implemented in this field. An example would be the *CliniFact*, a dataset recently developed for evaluating the accuracy of large language models (LLMs) in verifying scientific claims specific to clinical research (Zhang et al., 2025). In healthcare this is particularly useful because accurate information is critical for patient care and decision-making (Li & Wu, 2025).

In terms of challenges of using GAI and outcomes provided, it is noted that the ability to add value to education should encompass both the professor's skills in using technology and the student's skills in interacting with technology and constructing their knowledge. However, previous research suggests that both professors and students are not sufficiently prepared to use technology properly, even considering that students are digital natives, and also highlights the lack of infrastructure to use the technology of Wi-Fi or smartphones, the lack of technological support and the training (Daniela et al., 2018). Regarding training, it should be noted that the quality of the information obtained from GPT depends on the specific instructions

or questions called prompts. These prompts should have specific characteristics to elicit a right response, including the clarity (clear and easy to understand), specificity (with details to guide the response), context (background information), structure (logical organization of the prompt), tone and style (indicate the desired tone, such as informal or formal), constraints (specify word limits or areas of interest) and examples (when appropriate, provide examples of the type of response expected) (Lee & Palmer, 2025; UNITEC, 2024). In addition, recent works highlighted the importance of the accuracy of these prompts in healthcare, detailing instructions for ensuring safety and reliability of using GAI in this field (Maaz et al., 2025; Patil et al., 2024).

In terms of ethical issues are important to consider ensuring that GAI is implemented in a fair and beneficial manner in the education and training in higher education, with a focus on healthcare professionals (Díaz-Guio et al., 2024; du Boulay, 2023). As GAI can be used by students to solve assessment activities, one of the issues of particular concern to teachers is academic dishonesty. In the same vein, over-reliance on GAI for writing essays or solving clinical cases does not seem to enhance students' competence acquisition. If GAI is used indiscriminately and without limits, and this dynamic is accepted in higher education, there is a risk that students will not develop their creative and critical thinking skills. Students need to learn to relate complex ideas and concepts, to think critically and to make decisions. The development of these skills during their academic education is essential for them to be able to carry out their future professional activities with excellence, confidence and security (Ponce de Leon et al., 2023).

And last, but not least, another important ethic issue is the privacy and security of student data. Collecting personal data and using GAI in education may raise concerns about data privacy and security, especially if the data is shared or sold to third parties. There are concerns about the collection and storage of personal user data (Bandara & Senanayaka, 2024; Zhang & Kamel Boulos, 2023). Thus, the correct use of GAI encompasses the proper regulation to protect the intimacy and privacy of students (Sallam & Sallam, 2025). Similarly, GAI can reflect and perpetuate gender or ethnic biases due to the lack of available published information (Alonso-Rodríguez, 2024). In a healthcare context, this can lead to inequalities in treatment and diagnosis for different groups of people or even suggest unsafe or untested treatment options. For this reason, is needed to learn to use GAI responsibly and to check the answers we get before accepting them as valid (Zhang et al., 2022; Zhang & Kamel Boulos, 2023). Thus, it is essential to develop and use algorithms that are fair and do not discriminate against any demographic group, helping to avoid the perpetuation of stereotypes (Cernadas & Calvo-Iglesias, 2020; Parlamento Europeo, 2024).

4.1. Limitations and Strengths

The limitations of this study are mainly related to a lack of resources, time and personnel. This meant that it was not possible to visit every university in Spain and describe their policies in this area. It should be noted that our objective was to provide an overview of policy content (specifically concerning verification recommendations) rather than detailed information on the guidelines of all Spanish universities. Future research should extend to each university to identify possible gaps in higher education institutions in this regard. These findings could facilitate the unification of policies, criteria and recommendations within the Spanish university system.

5. Conclusions

Using generative AI in higher education offers significant opportunities to enhance student learning and professional preparation. However, the development of clear, standardized, and publicly accessible policies is essential to ensure the systematic verification of GAI outputs—particularly in healthcare education, where accuracy is critical. The main institutional recommendations for ethical use, as outlined on the websites of universities that publicly provide such guidance, emphasize responsible, transparent, and critical engagement with GAI, its use only when explicitly authorized by instructors, and the citation of any tools employed. With a view toward strengthening students' critical thinking and information literacy, it is therefore important to clarify which verification methods are used to ensure that GAI-generated outputs are accurate, reliable, and free from bias. With the emphasis on health sciences, students must be trained to use GAI as a complementary support tool rather than as a primary source for clinical decision-making, reinforcing the need for robust verification practices embedded within institutional guidelines.

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Data Availability Statement

The authors confirm that the data supporting the findings of this study are available within the article [and/or] its supplementary materials.

The prior version of this manuscript was published as a preprint in Preprints.org, available at <https://www.preprints.org/manuscript/202503.0327>, DOI:10.20944/preprints202503.0327.v1

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