

# Generative Artificial Intelligence on the Scene of Higher Education in the Health Sciences

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## ABSTRACT

**Introduction:** This article focuses on the experience of a privately managed University Institute in Buenos Aires city when addressing artificial intelligence (AI) in education. The aim is to share strategies and outcomes to encourage reflection and critical engagement with this technology within the educational community.

**Development:** We present a narrative of experience concerning the design of four lines of action to address the uses of generative AI applications (GenAI) in higher education in health sciences: drafting a state-of-the-art report; probing knowledge within the educational community; training sessions for core institutional actors; production of guide materials.

**Results:** There is a growing interest in GenAI within the educational community. We register positive experiences with IAGen applications, finding them intuitive and useful for research and teaching. However, we highlight challenges, such as gaps in knowledge on how to use these tools most effectively. Training has been crucial in addressing these challenges and has been conducted for members of the Education Department team, authorities, and teachers.

**Conclusion:** GenAI is fundamentally permeating higher education in the field of health sciences. University institutions are responsible for promoting the development of digital competencies and standards of responsible use. As GenAI continues to evolve, addressing new challenges and regulations is essential, encouraging reflection and ongoing training within the educational community. Interdisciplinary work and collaboration among various areas of institutional management are critical to address these technological changes in education.

**Key words:** artificial intelligence, artificial intelligence literacy, generative artificial intelligence, ChatGPT, higher education, educational technology, digital literacy, digital competence.

## La Inteligencia Artificial Generativa en la escena de la educación superior en ciencias de la salud

### RESUMEN

**Introducción:** este artículo se enfoca en la experiencia de un Instituto Universitario de gestión privada de la ciudad de Buenos Aires al abordar la inteligencia artificial (IA) en educación. El objetivo es compartir líneas de acción y resultados para promover la reflexión y apropiación crítica de esta tecnología en la comunidad educativa.

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Recibido: 27/10/23 Aceptado: 27/03/24 En línea: 29/03/2024

DOI: <http://doi.org/10.51987/revhospitalbares.v44i1.304>

**Cómo citar:** Magallan LE, Jalley MV, Giorgini GN, Berk MD, Kamerman MA, Lacueva JI, Schwartzman G. Las Inteligencias

Artificiales Generativas en la escena de la educación superior en ciencias de la salud. *Rev. Hosp. Ital. B. Aires.* 2024;44(1):e0000304

**Desarrollo:** se presenta un relato de experiencia referido al diseño de cuatro líneas de acción para abordar el uso de aplicaciones de IA generativa (IAGen) en la educación superior en ciencias de la salud: elaboración de un estado de la cuestión; indagación de conocimientos en la comunidad educativa; capacitaciones para actores institucionales clave; producción de materiales guía.

**Resultados:** se observa un creciente interés en la IAGen en la comunidad educativa. Se registran experiencias positivas con aplicaciones de IAGen, encontrándolas intuitivas y útiles para la investigación y la enseñanza. Sin embargo, se destacan desafíos, como la falta de conocimiento sobre cómo usar estas herramientas de manera eficaz. La formación ha sido clave para abordar estos desafíos y se ha llevado a cabo para integrantes del equipo del Departamento de Educación, autoridades y docentes.

**Conclusión:** la IAGen está atravesando integralmente la educación superior en el campo de las ciencias de la salud. Las instituciones universitarias tienen la responsabilidad de promover el desarrollo de competencias digitales y criterios de uso responsables. A medida que la IAGen continúa desarrollándose, es esencial abordar nuevos desafíos y regulaciones, promoviendo la reflexión y la formación continua en la comunidad educativa. El trabajo interdisciplinario y la colaboración entre diversas áreas de gestión institucional son fundamentales para abordar estos cambios tecnológicos en la educación.

**Palabras clave:** inteligencia artificial, alfabetización en inteligencia artificial, inteligencia artificial generativa, ChatGPT, educación superior, tecnología educativa, alfabetización digital, competencia digital.

## INTRODUCTION

Artificial Intelligence (AI) has been the subject of controversies, discussions, and expectations for some time. However, in the past year, it has gained increasing public notoriety with applications multiplying daily, significant media presence, and the viralization of AI-generated content, among other indicators.

This impact and growing presence are not limited to informal or media conversations. According to the 2023<sup>1</sup> AI Index Report, AI research is increasing across all fields. The total number of publications on the topic has doubled since 2010: while approximately 200,000 publications were registered that year, the total approached 500,000 in 2021.

These technological developments have strongly challenged university organizations, and our institution is no exception. In this context, the Department of Education included AI as part of its 2023 work agenda to study it, analyze its implications, possibilities, and limitations in educational contexts, and carry out various actions with the reference educational community to promote joint reflection and its critical appropriation.

This article aims to share the lessons learned on this topic, share the lines of action developed and their results, and provide some discussions to continue collective thinking.

## DEVELOPMENT

Since its inception, the Education Department has been working on the training of the institution's teaching community with a perspective that recognizes how digital culture permeates educational processes and the genuine integration<sup>2</sup> of digital technologies in teaching.

This article shares an account of the work and management experience carried out by this Department

in close collaboration with other areas of institutional management.

As mentioned above, the main priority was to address the implications of using generative AI applications in higher education in the health sciences. To this end, we designed a work plan with actions aimed at key institutional profiles: authorities (from coordinators to the rector's office), teachers, members of the education department, and students.

The developed experience involved four actions:

1. State of the art. We researched AI to understand its origins and impact on higher education, establishing a conceptual framework to determine to what extent higher education is affected by these technological developments.
2. We surveyed the educational community in our institution to gauge their knowledge, experiences, and concerns about using GenAI in education. Through digital surveys conducted before the development of the training actions, we sought to build an initial approximation to the personal experiences and the assessments and concerns regarding the use of GenAI in education.
3. Design and implementation of training for the key institutional actors. These were situational proposals that aimed to problematize the use of these technologies in professional activities according to the specific roles they play in this institution, as well as recognizing the potentialities and necessary frameworks to incorporate or expand their use. They were designed as timely instances to consensually identify, with the educational community, some challenges for teaching, learning, and academic management.

Design of guidance materials for developing good practices in academic production. The aim was to guide the development of collective and collaborative products to respond to needs arising in the spaces for reflection and to promote a responsible and critical approach to these technologies within the academic framework. The following section describes each of these four actions and their main results.

## RESULTS

The following is a summary of the progress and provisional achievements of the work and management experience carried out by the Education Department, in close collaboration with other areas of institutional management, during this period. Provisional in that they represent ongoing lines of action that allow for replication as they are but also give rise to new interventions that enrich them.

We organize this section with the characterization and results according to the four main lines of action that make up the experience that is the subject of this publication:

### 1. State of the question

Although there is no universally accepted definition of AI<sup>3</sup>, to reach a consensus on a starting point when referring to AI today, it is interesting to take UNICEF's definition<sup>4</sup>:

[AI refers to] machine-based systems that can make predictions, recommendations, or decisions that influence real or virtual environments, given a set of human-defined goals. AI systems interact with us and act on our environment, directly or indirectly. They often appear to operate autonomously and can adapt their behavior by learning about the context.

Looking back in history, the term 'artificial intelligence' was first used in 1956 at Dartmouth College (US university) to conceptualize: "(...) the study that seeks to make computers perform intellectual activities that people currently do best"<sup>5</sup>. In the following decades, AI developed intermittently, with periods of rapid progress called AI springs, interspersed with others of little progress, like the AI winters in the 1970s and 1980s<sup>6</sup>. In the new millennium, progress was made in AI developments for facial recognition, recognition of elements in photos, and predictive keyboards, among others. Staggered advances were made in branches capable of processing and analyzing millions of data to identify patterns and make deductions (known as Machine Learning and Deep Learning). That has allowed developments such as IAGen, a branch that enables the generation of texts, images, videos, 3D objects, audio, and source code, among others, from requirements made by its users, which can be expressed both in written text in natural language and through applications that currently accept multimodal inputs, generating different types of outputs from various inputs<sup>7,8</sup>.

Particularly in education, as early as 2016, the Stanford University report "Artificial Intelligence and

Life in 2030" foresaw for this decade the transversal incorporation of AI in educational activities to improve the interaction of students, teachers, and content in face-to-face and distance education<sup>9</sup>. What is appropriate and valuable to teach and learn in these times to promote the development of digital competencies within AI systems? In the words of Coicaud: "The new generations will have to face a changing labor market, different from the current one, in which artificial intelligence will become consolidated and will be a demarcating factor of competencies"<sup>10</sup>.

In education, AI systems are a potentially valuable resource with multiple possibilities and uses for teachers and students. They do not replace the individual but enhance their work and multiply the opportunities for teaching and learning<sup>11</sup>. In implementing these tools, the intervention of the subject and the mediation of their criteria in the use and analysis of the productions made with them is fundamental.

It is important to emphasize that in this type of technology, there is no such thing as value neutrality since these are activities carried out by people and involve using algorithms and databases that favor a specific way of understanding and doing things in the world<sup>12</sup>. It is also central to make people aware that the results delivered by these tools depend on the data entered so that the answers received may be incorrect, inaccurate, or contain biases based on the information with which the algorithms received training, as mentioned above. Then, it requires the development of regulatory guidelines to frame its use in both social and academic life, responsibly and ethically, aspects which have made progress (such as the Beijing Consensus on AI and education, 2019) and should continue deepening.

However, how can AI applications be integrated into teaching, what is the point of doing so, and what processes are of interest to promote and enhance with these tools? These questions, among others, accompanied the development of the other lines of action on this topic.

### 2. Inquiry into Knowledge about the Topic within the Educational Community

The first step was to survey authorities and teachers\* interested in participating in training activities (see Section 3 below), which was answered by 93 people.

The guiding questions of the questionnaire revolved around whether they had experience using AI-based applications, for what purposes they used them, their assessment of their usage experience, and their concerns and expectations regarding new developments in their professional field.

52% of the respondents stated that they had used some AI-based tool, 36% reported having no usage experience, and the remaining 12% were unsure if they had used AI-based tools. In this regard, it is worth mentioning that chat

\*At the time of writing this article, the actions with students are being designed, so we cannot yet report their outcome.

applications based on natural language (mainly ChatGPT) are the most used by this population. To a lesser extent, they mentioned applications used for supporting the translation of academic texts and writing abstracts in English (such as Google Translate® and Grammarly®), and a few responses mentioned tools for image generation (using applications like Dall-e® and Vana®).

Those who responded affirmatively indicated that they had used some AI-based tool at least once, out of curiosity, to understand what it is and what it can do. The most requested tasks from chat applications are information search, data analysis, and help writing texts, articles, abstracts, protocols, manuals, etc. They also mentioned using these applications to plan a class and create questions for an evaluation instrument (such as multiple-choice or open-ended questions). Some respondents also noted that they often consult these tools for patient-related questions, exploring concepts related to specific subjects or topics. In very few cases are these tools used for designing images, graphics, dynamic presentations, etc. In this context, research-related purposes predominate, followed by teaching activities to a lesser extent.

Additionally, the analysis indicates that most people had a positive experience using these tools, finding them intuitive, productive, and very helpful as academic support. However, in many other cases, the experience was overwhelming due to the amount of information provided or, conversely, because it was insufficient or incorrect. This latter issue resulted from a lack of knowledge on using the tools. For example, when searching for information, users are unsure what questions to ask or which are the appropriate criteria to guide the search (prompt creation) to obtain the desired results.

It is worth highlighting that AI developments generate great enthusiasm among most respondents, who emphasize the multiple application possibilities, the streamlining of tasks, and the reduction of error margins in written productions and analyses. They also express a keen interest in learning more about these applications, exploring teaching activities and proposals, understanding in which situations it is appropriate to use them to facilitate educational processes, and reflecting on their impact on their teaching practices within the health sciences.

On the other hand, a recurring concern is the lack of knowledge regarding the available tools that could be useful for their daily tasks, research, or teaching within the health sciences. Additionally, there is uncertainty about the consequences of their misuse and the potential impact on personal, educational, and professional life. There is also concern about the absence of applications that allow for the recognition of false or erroneous information, such as distinguishing between something “real” and AI-generated content. Furthermore, there is unease about ethical issues that arise in the educational field, such as the difficulty in discerning if students’ productions are “copied from ChatGPT” or if the increasing use of AI

affects the development of academic writing and reading skills, to name a few examples.

### 3. Training Actions for Key Institutional Actors

Based on the state of the art reviewed and the inquiry into knowledge on the topic within our institution’s educational community, it is worth asking: How can we facilitate teacher training that encourages the reflective appropriation and critical use of AI tools, recognizing their opportunities and limitations?

In this regard, training sessions were designed to address actual practices and needs in collaboration with the Department of Technology and Multimedia Development. These sessions promoted the contextualized use of new knowledge with an integrative techno-pedagogical approach that considers current and future practices and reflections on them. Below are descriptions of the three training proposals implemented, aimed at leading institutional figures:

#### *a) Training for the Education Department Team at IUHIBA*

We decided to start with this group because the members of the Department interact daily with authorities, teaching teams, and students. Training began with those who could have a multiplying effect by advising teams and designing work lines with a techno-pedagogical foundation on the subject. We called upon a specialist in the techno-pedagogical field with expertise in AI development to lead this training.

#### *b) Training for IUHIBA Authorities*

Twice a year, those with leadership responsibilities at the University Institute gather for action training sessions on strategic topics for institutional life. It was agreed that the first meeting in 2023 would be devoted to this topic. The session was jointly designed by the Education Department’s Directorate, the Director of the Department of Technology and Multimedia Development, and a specialist in the techno-pedagogical field with expertise in AI. It also included a panel to learn about AI usage experiences under development in the hospital and university institutional contexts.

It is worth clarifying, although it may be evident, that working with authorities from all management areas of the Institute results in a cross-sectional view of the challenges that the educational system as a whole must face in light of these technological developments.

#### *c) Training Workshops for Teachers*

We offered two training actions: one for teachers pursuing a Specialization in University Teaching for Health Professionals and another aimed at program authorities and the teaching community of the institution.

After providing a general characterization of the topic and the challenges for university teaching, we invited participants to explore the use of ChatGPT as an assistant in teaching tasks and to reflect on its possible uses and limitations for management, teaching, and learning in higher education in the health sciences.

The following table details the number of participants in each of these actions:

**Table 1.** Actions and participants IUHIBA

Actions	Participants
Training for the Education Department team at IUHIBA	20
Training for institutional authorities	50
Training for teachers	110
Total number of participantes	180

Based on the attendance at the organized events.

This line of work is currently in development. In the coming months, there are plans to conduct, in collaboration with the Student Welfare Department, a training session for students of the Institution to address the potential and limitations of using AI-generated applications as study assistants. There are also plans to offer training activities during 2024.

#### 4. Production of Guide Materials for Good Practices in Academic Production

We have identified the need to establish criteria for best practices in academic production as they encounter the intervention of AI applications in research processes, knowledge circulation, and development of scholarly papers.

To this end, there are plans to promote spaces for exchange and collective analysis among students, teachers, authorities, and management teams in the educational community. This process, endorsed by the Superior Council (the highest institutional authority), aims to create an institutional document with guidelines for academic production preparation and communication, including good practices for using AI applications.

When this article was presented, there were two meetings with around 15 participants attending both sessions. The first outcome was the creation of a digital resource that links reference documents and theoretical materials to establish a single perspective for production\*\*. The second result was the collective establishment of the main challenges to address in the guide: the need to rethink student assessment proposals, to consider the biases present in AI-generated applications, the reliability of what these tools produce, and concerns regarding authorship in this new context. Currently, the criteria for addressing these challenges are under development. For example, the proposed recommendations revolve around

making AI-generated applications transparent when used as an assistant in production and ensuring that whatever the tool generates should be subject to analysis.

## CONCLUSIONS

The rapid development of IT crosses different areas of society, including education. It offers exciting opportunities for teachers and students. However, it also presents limitations and risks that need careful consideration for its responsible and ethical use.

As S. Giannini points out, the accelerated development of digital technologies can be disorienting, even when their potential to improve people's lives and provide new possibilities for education is recognized<sup>18</sup>. In this sense, higher education institutions have the mission to advance in the training of educational communities to promote the development of the competencies required for adequate integration of AI, to generate criteria for its use, and to raise awareness of the possibilities offered by these tools as well as their scope.

The actions developed by the Department of Education in collaboration with other areas of institutional management fulfilled the purpose of opening spaces for the reflexive and critical appropriation of these emerging technological tools. They also addressed how they can be integrated into academic production practices, focusing on training professionals in the health field and our role as a university institution, leading to a collective consensus that strengthens the sense of belonging to our educational community and institutional identity.

On the other hand, we are working on the creation of new guiding resources for teachers and students to facilitate the effective use of these technologies, understanding that they are already part of the training and professional development, a trend expected to continue to increase.

This work raises questions that require further reflection. In this regard, it is worth asking: What is appropriate and valuable to teach and learn in higher education in the health sciences to achieve the required digital competencies? What skills, competencies, and tasks should not fall to machines<sup>14</sup>? Which ones could be assigned to enhance processes and leave time and energy for other issues? What power relations exist in certain moments and contexts while considering the heterogeneity of realities in the various geographic regions? What regulatory frameworks should we foresee?

Given the constant evolution of IA, it will be essential to include the new questions that will arise shortly, approached from the valuable transversality and the articulated work with the other areas of institutional management.

**Acknowledgments:** We thank Tania Soza for her contribution to the survey data processing.

**Author contributions:** Conceptualization: LM, MVJ, GS. Methodology: GG, MB, MK. Research: MB. Resources: LM, GG, MB, MK, JIL. Data curation: GG, MB, MK. Writing-Original draft: LM, MVJ, GG, MB, MK,

\*\*<https://padlet.com/IUHICampusVirtual/insumos-sobre-ia-para-la-produccion-acad-mica-y-o-el-mbito-u-d1gmru53d8qpvvou>

GS. Writing-Revision and editing: LM, MVJ, JIL, GS. Visualization: LM. Supervision: LM, MVJ, GS. Project Management: LM, MVJ.

**Conflicts of interests:** the authors declare no conflicts of interests

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