



Webinar: Artificial Intelligence Tools for University-Level Teaching and Research

Webinar: Herramientas de Inteligencia Artificial para la docencia e investigación a nivel universitario

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ABSTRACT

This work focuses on the identification, analysis, and dissemination of various Artificial Intelligence (AI) tools applicable to the academic context at the university level, particularly in the areas of Biology, Chemistry, and Ecology. More than 20 AI tools were reviewed and classified according to their functionality, including general-purpose chatbots, reference managers, PDF file organizers, concept map generators, collaborative work platforms, presentation creators, academic writing assistants, and video generators. A selection of these tools was used to structure a virtual webinar consisting of ten synchronous sessions of three hours each, aimed at developing an Edublog for consultation and dissemination. During the webinar, each tool was presented with integrated descriptions, direct links, tutorials, comparisons, and examples of academic applications. A virtual classroom (VC) was also created, where session recordings, materials, and hands-on activities were hosted to complement the Edublog, thus creating a virtual learning environment (VLE). The result was an accessible and up-to-date resource for using AI tools, promoting ethical and informed usage among the academic community of the Facultad de Estudios Superiores Zaragoza and other users who consult it.

Keywords: Artificial Intelligence tools, Edublog, Webinar, Virtual classroom.

RESUMEN

Se presenta un trabajo enfocado en la identificación, análisis y difusión de diversas herramientas de Inteligencia Artificial (IA) aplicables al ámbito académico universitario, particularmente en las áreas de Biología, Química y Ecología. Se revisaron más de 20 herramientas de Inteligencia Artificial (IA) que se clasificaron según su funcionalidad como chatbots de uso general, gestores bibliográficos, gestión de archivos PDF, generadores de mapas conceptuales, trabajo colaborativo, creación de presentaciones, redacción académica y generadores de video. Seleccionando algunos de ellos, se estructuró un Webinar virtual de diez sesiones sincrónicas de tres horas que tuvo como propósito el desarrollo de un Edublog para consulta y difusión. En el Webinar, se presentó cada herramienta integrando descripciones, enlaces directos, tutoriales, comparativas y ejemplos de cómo aplicarlas en cuestiones académicas. También se creó un aula virtual (AV), donde se alojaron las grabaciones de las sesiones, materiales y actividades prácticas complementando al Edublog, creando así un entorno virtual de aprendizaje (EVA). Se logró un recurso accesible y actualizado para utilizar herramientas de IA, promoviendo un uso ético e informado entre la comunidad académica de la Facultad de Estudios Superiores Zaragoza y demás usuarios que lo consulten.

Palabras clave: Herramientas de Inteligencia Artificial (IA), Edublog, Webinar, Aula Virtual.

INTRODUCTION

Technology has advanced considerably in recent years, transforming education worldwide from the introduction of the first computers in classrooms to the development of online learning platforms. In this context, the use of Artificial Intelligence (AI) to automate tasks, support learning, and analyze personalized data is a recent development that has changed teaching and learning from basic education to higher education (1 y 2).

Currently, university students use these tools daily, both inside and outside the classroom, which makes it necessary for teachers to become familiar with these technologies to identify their use and guide their responsible and ethical application in the academic context. This implies not only taking advantage of their benefits but also fostering spaces for interdisciplinary collaboration that promote appropriate use in teaching (3).

However, integrating these technologies into the educational environment is not without challenges, such as limited access to digital resources, lack of teacher training in the use of AI, and ethical concerns related to data privacy. These aspects must be addressed to ensure the responsible and effective use of these technologies in educational institutions (4). Therefore, it is important to publicize the potential applications and advantages of these AI tools to promote more conscious and responsible use, thereby encouraging recognition of their benefits as support in research and teaching.

In this context, an educational strategy that has gained relevance is the use of Virtual Learning Environments (VLEs). These are digital spaces that integrate various technological and online tools, supporting collaborative work and the development of skills in students, such as critical thinking and creativity. VLEs can be configured as spaces that stimulate collaborative creativity among university students, provided that they incorporate digital tools, promote dialogue, clearly define creative tasks, and include teacher guidance throughout the process (5).

Within EVA, edublogs, in addition to serving as information repositories, foster participation among students and teachers. These spaces facilitate access to knowledge and the exchange of ideas, while also promoting the development of digital skills through the creation, organization, and dissemination of educational content (6).

Another digital tool that has gained considerable importance in virtual educational environments is the webinar. Webinars (or web seminars) are video presentations, workshops, seminars, or classroom talks that are held online, usually live. Their distinctive feature is that both presenters and attendees can communicate in real time during the session, allowing questions to be answered and documents of any type to be displayed. They are useful for communicating and disseminating information to the audience on a wide range of topics, such as the use of AI (7).

This work focuses on the analysis and dissemination of different AI tools applied to university education, with emphasis on their usefulness in supporting scientific research processes, particularly in the areas of Biology, Chemistry, and Ecology. In this regard, it is also recognized that both educators and students must engage in continuous training, not only to learn how to use these technologies but also to understand how to apply them within educational environments.

METHODS

Initially, various AI tools of the chatbot type were identified, including Chat GPT, Chat PDF, Gemini, Perplexity, Text Cortex, and Copilot. Their response capabilities were reviewed in terms of clarity, accuracy, and usefulness when answering questions or generating academic content in disciplines such as Biology and Ecology.

Additionally, complementary research-related tools were identified, including search engines for scientific articles, generative AI for concept maps, academic discussion spaces, tools for creating slide presentations, and tools for producing audiovisual materials. Free accounts were created for each selected tool to test its functions. After analysis, all reviewed tools were organized and classified according to their usefulness and applicability in academic contexts.

Based on this analysis, a course-workshop in webinar format was designed for a university audience interested in applying AI tools to the academic environment, particularly in the areas of Biology, Chemistry, and Ecology. For this purpose, a syllabus was designed that covered the content in thematic sections, each section being addressed in online sessions. Presentations for each topic were conducted synchronously via Zoom, with activities or assignments to be completed asynchronously.

An edublog was created using WordPress as a central element for the development of the

webinar. This blog collected and organized the resources created, including brief descriptions of each tool in its free version, with information on its strengths and limitations. Simple examples of the application of these tools to academic works in the aforementioned areas of knowledge were highlighted during synchronous sessions, and comparative tables of the various tools reviewed were also presented.

In addition, comparison tables for some of the reviewed tools are included. This edublog is an open-access resource that serves as a continuous reference tool for the webinar participants and remains accessible to all those interested in the topic.

Additionally, a virtual classroom (using Moodle) was created within the virtual campus of FES Zaragoza; it served as a workspace hosting the general syllabus, a series of practical activities that participants were required to submit at the end of each session, links to the analyzed tools, and examples of work carried out with AI support. This space was updated as the webinar sessions progressed, and the sessions were recorded and subsequently hosted in the same virtual classroom, facilitating asynchronous consultation by participants.

At the end of the last session, a questionnaire (using Google Forms) was administered to analyze the impact of the webinar on participants in a before-and-after comparison of the course-workshop.

RESULTS

Webinar: design, structure, and delivery.

A course-workshop was delivered in a webinar format, consisting of 10 synchronous sessions, each lasting 3 hours. In the first part of each session, conducted synchronously via Zoom, each topic was explained, and some of the tools were reviewed with examples applied to the area of biology, with the support of the developed Edublog.

At the end of the explanation of each tool, participants explored it autonomously, reflecting on its usefulness through practical activities. These activities consisted of consulting the tool about topics that participants knew or had mastered, to identify the accuracy of the IA responses, and answering reflective questions. The purpose was to generate discussion, debate, and conclusions by sharing their results in a collective analysis at the close of each session.

Based on that first version, the synchronous session, and the elements of the discussion, participants were asked to generate a final “improved” version in accordance with the academic activities carried out by each participant; this version was delivered in the virtual classroom developed for this course.

Edublog: design and development

As already mentioned, the management of the webinar focused on the development of an Edublog called “Inteligencia Artificial Educativa”, available at <https://blogceta.zaragoza.unam.mx/iae/>, structured into thematic sections, each dedicated to a specific category. Each entry described the tool's functionalities, the advantages and limitations of the free versions, and, at the end of each explanation, provided a direct link to the tool (Figure 1).

The blog presents tabs or menu options with their corresponding submenus for each tool.

- Home: The purpose and objectives of the blog are presented.
- General tools or chatbot-type: Chat GPT, Gemini, Copilot, Meta AI, Claude, and Deep Seek.

Chatbot-based tools are reviewed, with examples focused on the educational field, such as content generation and development of evaluation proposals, among others.

- Bibliography Management: Semantic Scholar and Research Rabbit.

Tools for exploring, organizing, and visualizing scientific literature, which allow the discovery of new articles, authors, and relevant connections.

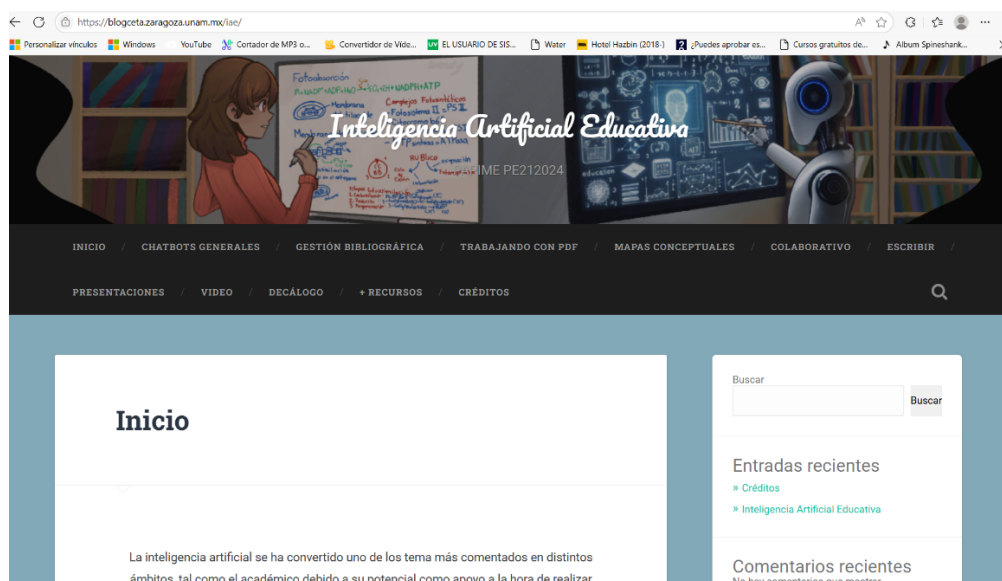
- Information management from PDF files: Chat PDF, Small PDF, and Chatize.

These tools are used for exploring, understanding, and managing academic documents in PDF format; they allow files to be summarized and queried, in some cases without language barriers.

- Concept Map Generators: Algor Education, Gitmind, and Mymap.ai.

Tools that allow the generation of concept maps in an automated or assisted manner from a prompt, a previous text, or a given file.

Figure 1. Educational Artificial Intelligence Edublog.



Debate and Collaborative Work Tools: Kialo AI and Padlet.

These tools support teamwork and academic collaboration.

- Writing scientific documents and texts: Perplexity AI and TextCortex.

Tools that help to draft, summarize, or rewrite academic texts, facilitating the creation of clear and well-structured content.

- Presentation Generators: Emaze, Haiku Deck Zuru, Visme, Canva AI, Beautiful.ai, Tome AI, Gamma, and Send Steps.
- Video Generators: Pictory and Synthesia.
- Decalogue of good use of AI: to promote the ethical use of these tools, highlighting their potential as support for academic work while respecting the work of the original authors.
- +Resources: A wide range of external sources that complement and support academic activity at different educational levels.

Virtual classroom: design and development

A virtual classroom was developed to manage the course activities, indicating the activity per session and delivery dates. It includes direct links to the AI tools explored, the activities, and the materials developed with AI support, and is available at the following address: <https://aulasvirtuales.zaragoza.unam.mx/cv/course/view.php?id=435>

Each of the Zoom sessions was recorded, and the videos were hosted in the virtual classroom, which complemented the Edublog.

In the last section of the virtual classroom, a series of materials developed with AI tools is presented, such as:

An example of the historical development of AI and statistical data analysis.

- An example of a concept map depicting logistic growth and its applications in ecology.
- An example of a debate on Kialo about the logistic model.
- A Gamma presentation based on an AI prompt.

This classroom is open access and available for participants to deepen their use of the tools or explore content beyond the blog.

The Webinar evaluation found that participants already knew general-purpose tools but were unaware of specific-purpose resources; they had heard of some of these resources but had not used them. A certain fear of using them due to piracy issues was perceived. Other relevant points are presented below.

Figure 3 highlights the potential for use in improving academic research and planning teaching activities.

A key point concerns the challenges of implementing the use of these tools in the university classroom, highlighting ethical and privacy aspects, as well as resistance to change among the actors in the teaching-learning process (Figure 4).

Figure 2. Presentation of the Virtual Classroom.

PRESENTACIÓN

Webinar: Inteligencia Artificial Educativa PAPIME PE212024

El propósito es proporcionarles una visión integral de cómo la Inteligencia Artificial (IA) está revolucionando la educación, desde herramientas prácticas hasta reflexiones éticas. Queremos ofrecerles algunas ideas para comprender esta tecnología y sus posibilidades en el aula.

Objetivos:

1. Entender los conceptos básicos de la IA y cómo funcionan en la educación e investigación en la educación superior.
2. Explorar herramientas actuales que utilizan IA para personalizar y mejorar el proceso enseñanza-aprendizaje.
3. Reflexionar sobre los retos éticos y prácticos que esta tecnología plantea en los entornos educativos.

Esperamos que se lleven no solo conocimientos, sino también ideas prácticas para implementar o evaluar el uso de IA en sus contextos educativos.

Herramientas de uso general

Enlaces a herramientas de Inteligencia Artificial de uso general

- Presentación del Webinar**
Enlace a la presentación del Webinar, se platica sobre los temas que conforman el Webinar
- Blog**
Blog de apoyo con todo el material que se revise en el Webinar
- Enlace a Chat GPT**
Enlace para acceder directamente a Chat GPT
- Acceso a Gemini**
Enlace a Gemini
- A trabajar con Copilot**
Acceso a copilot

Figure 3. Applications of the reviewed tools to academic work.

How do you plan to apply the knowledge acquired in this Webinar in your work or teaching?

22 responses

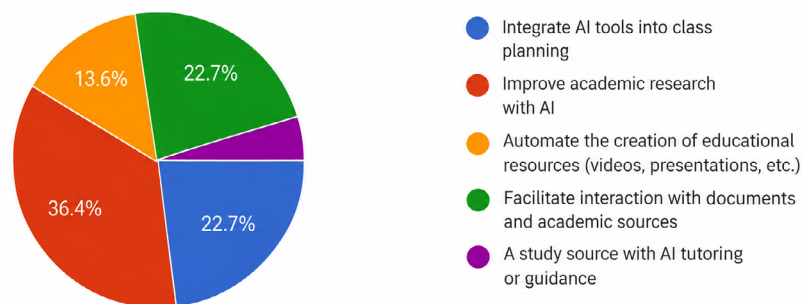
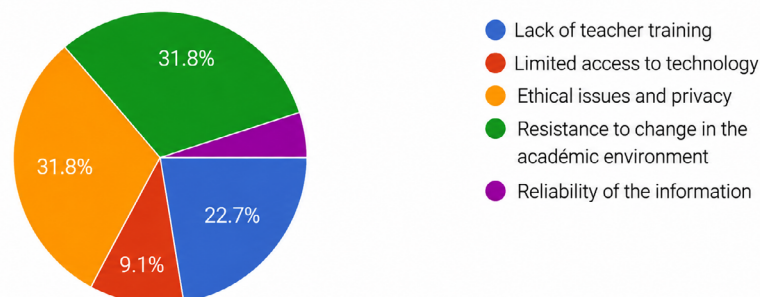


Figure 4. Main challenges for the use of AI in the academic field.

What do you consider to be the main challenges for implementing AI in education?

22 responses



Finally, participants were asked for a comment or suggestion to improve the course. For some, it was their first approach to these tools, while others envisioned using them in their daily academic activities. The teacher-student interaction during the course is highlighted, since it is important to share usage approaches.

Figure 5. Participants' comments.

Any comments, criticism, or suggestions that could help us improve this Webinar?

12 responses

An excellent webinar, my academic performance and academic activities will be improved with the proper use that I will give to the tools covered in this webinar. It will not replace my ability to learn and analyze, but it will certainly support it.

This was my first formal approach to the use of AI. It has been very enriching, and I feel confident that I will apply it in my academic work and in my classes, promoting its use with my students.

It was very useful, it completely changed my perspective, and personally I am very pleased that the Doctors from the Faculty have the initiative to learn new tools. I learned a lot and I really appreciate all the patience; it was a great inter-semester workshop.

I liked the format, very complete.

Excellent, the instructors were very dedicated and focused on what they presented. It is the first workshop of this type that I have attended, and I leave with enriched knowledge about a topic I had heard of, but had not wanted to explore, thinking it was just a trend. Professor Armando made it seem very easy, and he provided well-digested material, which I really appreciate.

The course was delivered a second time in 5 synchronous 3-hour sessions, with activities carried out by teams, which generated truly interesting debates and conclusions.

DISCUSSION

Through an exhaustive search process, a diverse set of artificial intelligence tools was identified, encompassing widely known platforms such as ChatGPT, Chat PDF, Gemini, and Copilot, as well as others less widespread but with high potential for application in the academic field, such as Research Rabbit, Perplexity, Chatize, and TextCortex. A greater diversification of AI uses was noted, which has gone beyond the field of conversational assistants, extending to areas such as knowledge organization, scientific information retrieval, text analysis, creation of visual resources, and digital collaboration.

Regarding their classification, the tools were organized based on their primary use in university scientific research work, considering both their technical functionalities, such as precision, clarity, and accessibility of use, and their applicability to tasks inherent to academic research. This classification not only facilitated their comparison but also guided users in selecting the most appropriate tool according to their needs. Furthermore, this classification facilitated the design of the Webinar and the Edublog, as well as the development of the course, which has already been taught 2 times.

The Edublog was designed as a digital space for open consultation, to make the contents generated during the development of the course-workshop available to the entire academic community. Its structure facilitates navigation by thematic categories and includes technical sheets for each tool, brief tutorials, visual comparisons, and examples contextualized in the field of biological and ecological sciences. Unlike the virtual classroom, whose functionality was directed exclusively at Webinar participants, the Edublog allows 1 continuous and independent consultation, extending the content beyond the synchronous event.

The virtual classroom functions as a space for interaction, where participants were able to discuss, experiment, and reflect on the possibilities and limitations of the use of AI in the university educational context.

Both the Edublog and the AV present examples developed during the delivery of this course, so they are complementary; we recommend examining and working with both materials.

The application of the evaluation form made it possible to detect the limited dissemination of specific-purpose tools, and knowledge of these tools made it possible to expand the potential use of AI in the academic field.

Also notable are the fear and precautions regarding its use, due to concerns about piracy or

the perception that their work was performed by AI with little involvement on their part, which is not yet entirely possible, since there are still AI “hallucinations” that require a good level of user knowledge.

It is necessary to analyze how students and teachers perceive its use and to note the technological gap: students believe that teachers do not know this type of tool, while teachers believe that students use them excessively to cheat on assignments, projects, activities, and even exams or evaluations. It is important and necessary to “build” communication bridges, but above all to promote academic values, considering the good and ethical use of the entire arsenal of technological resources that already exist and continue to emerge day by day.

CONCLUSIONS

Throughout the project, a wide variety of artificial intelligence tools were identified, ranging from chatbots to platforms for writing, organization, collaborative work, and audiovisual content generation.

These tools were classified according to their functionalities, which enabled their organization based on their uses in different stages of academic work, such as information search, knowledge structuring, preparation of scientific texts, and presentation of results through graphic, audiovisual, or videographic resources.

The dissemination process was initially carried out through a webinar, in which examples applied to the field of biological sciences were presented, and through practical activities that encouraged the participation of attendees. In parallel, the Edublog is available as an open-access digital resource, expanding the possibilities for autonomous exploration of AI tools and serving as a continuous consultation space for students and teachers.

These actions made it possible to analyze and disseminate the academic use of artificial intelligence as a complementary support in teaching, learning, and research processes. This work represented a contribution to the university community of the Biology program by providing an accessible resource that communicated how to apply these new technologies in academic and scientific training, while also noting that these tools are intended as support and not as a replacement for academic work.

It is suggested that work be undertaken to build collaborative and formative feedback relationships between the teacher and the students in the use of artificial intelligence. The teacher, for their part, will have the role of a guide, providing orientation on the ethical, strategic, and critical use of such tools, thereby promoting the student's responsible autonomy and enhancing their ability to evaluate information generated by AI. The student, for their part, will take an active role in learning and use, applying their own creativity and talent, and being transparent in the use of these AI applications, within an environment that values both innovation and academic integrity.

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CONFLICT OF INTEREST

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