

Ciencia Latina Revista Científica Multidisciplinar, Ciudad de México, México.
ISSN 2707-2207 / ISSN 2707-2215 (en línea), septiembre-octubre 2025,
Volumen 9, Número 5.

https://doi.org/10.37811/cl_rcm.v9i5

ARTIFICIAL INTELLIGENCE (AI) IN THE MEXICAN UNIVERSITY CONTEXT: AN EXPLORATORY ANALYSIS FROM THE RESEARCHER'S CONTEXT

**INTELIGENCIA ARTIFICIAL (IA) EN EL
CONTEXTO UNIVERSITARIO MEXICANO:
UN ANÁLISIS EXPLORATORIO DESDE EL
CONTEXTO DEL INVESTIGADOR**

Evelio Gerónimo Bautista
UPN 142 Tlaquepaque, México

Javier Gonzalo Rodríguez Ruiz
Universidad de Guadalajara, México

Erika Ochoa Rosas
UPN 142 Tlaquepaque, México

DOI: https://doi.org/10.37811/cl_rcm.v9i5.20117

Artificial Intelligence (AI) in the Mexican University Context: An Exploratory Analysis from the Researcher's Context

Evelio Gerónimo Bautista¹gebe_bautista@hotmail.com<https://orcid.org/0000-0001-6795-0404>

UPN 142 Tlaquepaque

México

Javier Gonzalo Rodríguez Ruizjavier.rruiz@academicos.udg.mx<https://orcid.org/0000-0003-2547-5996>

Universidad de Guadalajara

México

Erika Ochoa Rosasochoarosaserika@gmail.com<https://orcid.org/0000-0002-7489-4321>

UPN 142 Tlaquepaque

México

ABSTRACT

This research examines the perceptions of Mexican researchers regarding the adoption, utilization, familiarity, and perceived usefulness of AI tools in Mexican universities. Objective: We aimed to explore the potential of AI tools in both teaching and research within Mexican higher education, which is transforming teaching, learning, and research methods and practices. Methodology: The design and implementation of a survey allowed us to gather information on expectations for using AI in teaching and research activities. The results indicate that researchers are familiar with AI tools and have high satisfaction with their use, particularly in personalized or collaborative learning applications. Conclusions: This pioneering analysis for Mexico seeks to contribute to the debate on the benefits and risks of the widespread use of AI tools in higher education institutions. At the same time, it invites the academic and scientific communities to delve deeper into the implications of using AI in the higher education system and high-level research, benefiting students, teaching practices, and society as a whole.

Keywords: deep learning, teaching, research, university

¹ Autor principal

Correspondencia: ochoarosaserika@gmail.com

Inteligencia Artificial (IA) en el Contexto Universitario Mexicano: Un Análisis Exploratorio desde el Contexto del Investigador

RESUMEN

Esta investigación explora las percepciones de los investigadores mexicanos respecto a la adopción, el uso, la familiaridad y la utilidad de las herramientas de IA en las universidades mexicanas. Objetivo: Se buscó investigar el potencial de las herramientas de IA tanto en la docencia como en la investigación en la educación superior mexicana, donde la educación superior está transformando los métodos y prácticas de enseñanza, aprendizaje e investigación. Metodología: El diseño e implementación de una encuesta nos permitió recopilar información sobre las expectativas del uso de la IA en las actividades de docencia e investigación. Los resultados muestran la familiaridad de los investigadores con las herramientas de IA y una alta satisfacción con su uso, incluyendo aplicaciones de aprendizaje personalizado o colaborativo. Conclusiones: Este análisis pionero para México busca contribuir al debate sobre los beneficios y riesgos del uso generalizado de herramientas de IA en las instituciones de educación superior, a la vez invita a las comunidades académicas y científicas para profundizar en las implicaciones del uso de la IA en el sistema de educación superior y en la investigación de alto nivel, en beneficio de los estudiantes, las prácticas docentes y la sociedad en su conjunto.

Palabras clave: aprendizaje profundo, docencia, investigación, universidad

*Artículo recibido 02 setiembre 2025
Aceptado para publicación: 29 setiembre 2025*



INTRODUCTION

The global economy has generated multiple changes, and the incorporation of Artificial Intelligence (AI) is gaining popularity as a general-purpose technology. Over the last decade, the concept of AI has gained particular relevance in the productive and government sectors. We are witnessing a revolution in the educational context, where teachers are transforming their teaching techniques and adopting technological and pedagogical tools, thereby changing their approach to learning and interacting with students. In this sense, the Mexican educational system is seeking the most effective way to utilize technological tools across all types of universities and higher education institutions.

Some of the visible benefits of using these tools include personalizing the teaching-learning process, accessing extensive digital resources on the web, and supporting research, such as writing scientific articles, disseminating science, and connecting with other national and international scientific communities. Similarly, people view generative AI as an enabler that facilitates the development of human talent, promotes innovation, and advances technological development through its integration into the labor market (ILIA, 2024).

Despite these facts, technological tools have revolutionized all sectors of the population, generating changes in teaching and learning paradigms in the education sector. Numerous publications have demonstrated, for instance, that ChatGPT is the most widely used AI tool in educational contexts as a support strategy for education (Zumba et al., 2023). However, as far as we know (the tool was launched in 2020), it has not yet been fully exploited. Furthermore, educators and institutions utilize digital platforms and AI tools as writing assistants, personalized learning platforms, educational chatbots, learning management systems, and data analysis tools. The truth is that we are gradually witnessing how people understand and apply AI tools, thanks to MOOCs, large-scale training courses, and workshops. Educators and researchers initially use all of these AI platforms and tools as a strategy for teacher training, daily work with students, and research.

Within the specialized literature on artificial intelligence, researchers review specialized databases such as SCOPUS using the variables 'artificial,' 'intelligence,' and 'universities,' and they find approximately 12,376 documents published in the last five years, with English, Chinese, Spanish,



Russian, and German as the predominant languages. This means that researchers worldwide have published a significant amount of literature explaining the use of this tool in the educational context.

Undoubtedly, there are lessons, obstacles, and challenges in the use of AI in HEIs, such as risks on the web, managing and utilizing large amounts of information, digital literacy, and technological infrastructure. Michel et al. (2023) analyze the benefits and limitations of using ChatGPT in higher education. They address concerns related to academic integrity, plagiarism detection, and the potential impact on critical thinking skills, and highlight the need for empirical research to understand users' experiences and perceptions.

To contextualize the importance of AI, a report prepared for Latin American countries (ILIA, 2024) showed that Mexico was average in its AI literacy index (57.8 points), below nations such as Chile, Uruguay, Brazil, Argentina, and Costa Rica, among others, while it ranked below Chile, Uruguay, and Costa Rica in the human talent sub dimension. The report highlights a number of key requirements for countries to achieve increased labor productivity and improved quality of life: early computer science education, the inclusion of AI computational content in the curriculum, and English language skills.

Given this situation, it is urgent to generate empirical evidence on the perceptions of direct users of AI tools, particularly in the field of high-level scientific research. Therefore, the objective of this article was to investigate the use of AI by Mexican researchers registered in the National System of Researchers of the Ministry of Science, Humanities, Technology, and Innovation (SECIHTI). Their level of familiarity with the tools' everyday use, the main platforms used, the frequency of use, and their perception of their usefulness in their daily work activities. To this end, we designed a brief survey with thirteen items and validated it through a prior pilot test.

Based on the elements presented, we structured the article as follows: the next section addresses relevant aspects of the literature on AI, the third section presents the methodological aspects we used, and the fourth section presents the results. We present the conclusions and implications of our findings and the bibliography below.

LITERATURE REVIEW

Artificial Intelligence (AI) in education approaches from different angles and perspectives, such as the approach of pedagogy, technology, education and among others, like Computer science.



This section addresses the leading theorists of AI in education and its relevant advances in the educational context, to frame the objective of this article.

Skinner (2016) introduces interesting elements about the use of technology in education. Although he did not work directly with AI, he had an innovative vision for transforming education, adjusting both the pace of teaching and the thematic content of the curriculum. His main contribution was the "teaching machines", a device that used operant conditioning to obtain immediate and controlled feedback. These machines were used to grade students' assignments and functioned as intelligent tutoring platforms. Translated into the present, they were tools similar to adaptive learning platforms such as Coursera, Khan Academy, Duolingo, Moodle, or Blackboard, to name a few, with the significant differentiating effect of the disruptive technological era in which we find ourselves.

Along the same lines, Turing (2021), in addition to being the father of computer science and AI, set a precedent in the design of a test since 1950. It was an experiment that sought to measure whether machines thought, imitating humans. This test stood out for both approximating the measurement of the machine's deep intelligence and its ability to simulate it (in terms of reasoning, learning, and conversation). It was a disruptive and innovative proposal, as it revolutionized the philosophy of the mind and intelligence in the field of computer science.

In line with the theme, Marvin Minsky and John McCarthy (1927–2011), who designed machines to simulate cognitive processes, made the first contributions to AI. The relevance of these contributions lay in machine theories and the LISP (List Processing) programming language, which laid the foundation for AI, crucial advances in education. Minsky (1988) proposed in his theory the "society of the mind," a composite society where all elements interact with each other to generate a more complex process. He also contributed to the development of fundamental algorithms for AI, including automatic processing and logical reasoning systems. Other contributions by Minsky were "artificial neural networks." Together with Dean Edmond, he created the first neural network simulator, the Stochastic Neural Analog Reinforcement Calculator (SNARC), in 1951, and his criticisms helped to promote the approach of deep learning (the purpose of the neural network was to imitate a rat learning to get out of a maze).



McCarthy (1960) was another of the leading theorists and creators of AI, who coined the term "Artificial Intelligence." His main proposal was to investigate machines capable of reasoning, learning, and solving problems using a programming language (LISP). Furthermore, the author raised another interesting point: "Time-Sharing Systems," a method for sharing computer resources with different users who needed them, a precursor to what we now know as cloud computing.

Both Minsky and McCarthy have played important roles in shaping and evaluating AI, from the modular vision to the application of neural networks and robotics using linguistic tools. However, the application of AI has evolved, such as the development of LOGO, constructionist learning, the use of technology in education, learning for the future, among others. For example, Papert (1980), a mathematician and pioneer in the use of technology applied to education, whose work has focused on computer literacy.

In 1967, developers designed the LOGO language for educational purposes, using commands to facilitate the learning of a high-level programming language among children and young people. This language has enabled the learning of concepts oriented toward active and creative exploration, as well as constructive learning, with which students construct their own knowledge. It is a type of constructivist learning—previously proposed by Piaget—where students learn by constructing different tangible objects (Papert, 1980). Other contributions included the automation of tasks and the generation of personalized and meaningful learning environments, which inspired the development of interactive digital educational platforms and multidisciplinary approaches such as the STEAM methodology. Over time, technology has proven to transform teachers' teaching methods and student learning, from a constructivist perspective.

In Europe, policymakers and educators approach AI from a different perspective. They refer to it as the "digitalization of education," often without fully considering the participation of key stakeholders in the teaching-learning process—such as school principals, parents, school boards, and legislators—because they do not subject it to standardized, automated, or technology-enhanced assessment.

In contrast, schools must offer an appropriate education in a ubiquitously digitalized, complex, and changing world; for example, the development of innovation would be enhanced in a context where



today's student (future worker) develops critical thinking, problem-solving, communication, and teamwork (and the use of AI systems) (Benvenuti et al., 2023, p. 2).

The European Union has implemented guidelines and resources to help people build confidence with AI tools in educational contexts. Cortez et al. (2024) find a significant increase in the use of AI tools, which improves student performance by providing fast and quality communication, allowing students to interact and feel closer to both their classmates and teachers. That is, there is a connection between teachers and students in the teaching-learning process; they also show responsibility, vigilance, and security in the use of AI.

In the Mexican context, Sánchez (2023) explains how the use of ICT transformed society, especially the educational sector. MOOCs gained popularity, providing students with access to information and teaching materials from prestigious universities worldwide. The advent of AI has opened up innovative possibilities for acquiring new knowledge, accompanied by Machine Learning, which focuses on algorithms and systems. AI has made it possible to automate learning, reduce time with a behaviorist and constructivist approach, as well as interactive and engaging activities.

Undoubtedly, the cases of Perplexity AI, ChatGPT, Bard, and recently Deep Seek, as well as writing tools such as Grammarly and Gemini, have been among the most widely used and innovative disruptive apps in the Mexican context, which is constantly evolving and being assimilated (INCyTU, 2018).

These tools influence learning processes and allow educators to assess whether AI platforms truly support the pedagogical aspects of the classroom. Although most teachers use ChatGPT only as a complementary tool—often without supervision or monitoring—it undoubtedly enhances the learning process and knowledge acquisition in educational settings (Ali et al., 2024).

Reflecting on the implications observed in the Mexican case, they highlight the risks posed by the indiscriminate and intensive use of large linguistic models, such as those introduced by ChatGPT. Shumailov et al. (2024) go further, coining the concept of "model collapse," which they define as degenerative, caused by learned recursive models where the data generated ends up contaminating the possible results of the next generation, altering the results of reality in subsequent exercises.



A recent work for Mexico (Huerta & Zavala, 2023), in the context of teaching, also highlighted the lack and need for regulation and legislation in the use of AI, from a didactic and pedagogical perspective, considering students, teachers, and institutions. Tramallino and Marize (2024) also explain the importance of countries regulating the use of AI.

It is striking that a study on the penetration of AI in the northern Mexican state of Sinaloa (García, 2023) is notable. Revealed that the ChatGPT tool was not widely used by the student community eight months after its market launch, while the work of Onofre et al. (2024) speaks of the integration of AI and ChatGPT as a key tool for educational innovation. In other words, the dizzying advancement in the use of technology in the educational field is evident, as is its impact on social and economic progress. However, some studies for Mexico are inconclusive regarding its adoption and use.

However, research on the use of AI among academic researchers in Mexico is still scarce. These professors operate differently from professors who interact with students. Therefore, this article explores researchers' approach to AI tools in their daily work, highlighting their potential to improve efficiency and productivity, both in the classroom and in their research at the highest levels.

METHODOLOGY

We conducted a descriptive analysis based on cross-sectional data. The study included only research professors registered in Mexico's National System of Researchers (SNI) of the Secretariat of Science, Technology, and Innovation (SECITI) who were members of an instant messaging group. During the last week of September 2024, we recruited participants over a seven-day period, and they completed and validated 62 surveys.

We focused the survey on the use of AI in the educational context, both in teaching and research. Higher education institutions from 23 of the 32 Mexican states contributed to this sample. To better understand how teachers integrate AI tools into their activities, we organized participants into age groups. We used an exploratory approach to present the main findings and constructed tables, graphs, and word clouds. We designed the 13-item survey to gather basic sociodemographic data and insights into the penetration of AI in tertiary education.

It is essential to clarify that, due to the sample size; the results do not represent the entire population of research professors in Mexico.



Approximately 1,000 professors were part of the aforementioned messaging group, and by January 2025, SECIHTI (2025) had registered 44,902 members. The distribution included 11,096 Candidates, 23,527 Level 1, 6,838 Level 2, 2,651 Level 3, and 790 Emeritus.

We should note that Candidates, in ascending order of scientific and educational impact, are early-career researchers whose academic productivity is still developing. In contrast, Emeritus members are distinguished researchers with long-standing experience who have completed a full research cycle, although they may continue to be active in the field.

To highlight the main findings, we present selected survey questions in the results section.

RRESULTS

This section presents the research results we obtained from analyzing the data collected through the instrument on the use of artificial intelligence (AI) in the Mexican university educational context. Table 1 presents the demographic data we collected, including age group, gender, and participants' primary roles in the educational environment.

Table 1. Survey of research professors at higher education institutions in Mexico

Age/ Main role	Researcher	Professor	Managerial/ Administrative	Total
31-35	4	1	0	5
	12,5%	4,2%	0,0%	8,1%
36-40	7	4	0	11
	21,9%	16,7%	0,0%	17,7%
41-45	6	4	0	10
	18,8%	16,7%	0,0%	16,1%
46-50	5	7	1	13
	15,6%	29,2%	16,7%	21,0%
>50	10	8	5	23
	31,3%	33,3%	83,3%	37,1%
Total	32	24	6	62
	100,0%	100,0%	100,0%	100,0%

Source: Prepared by the authors (2024).

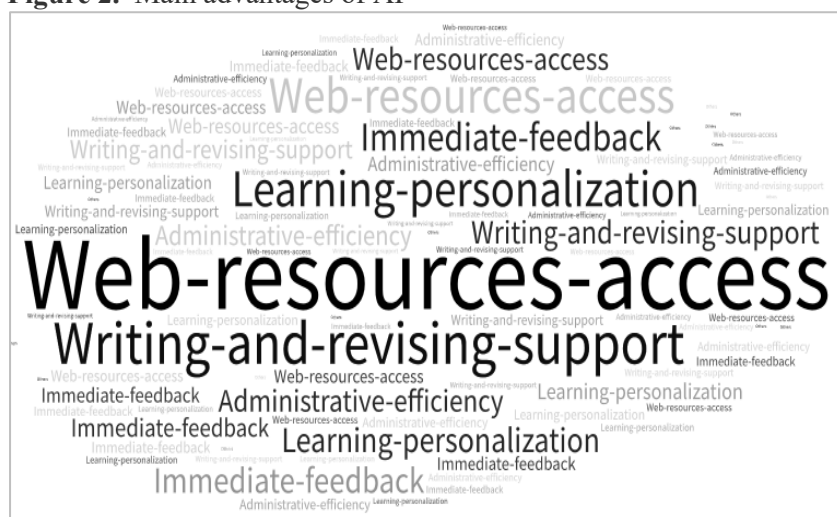
56,5% of those who responded to the survey were women. In this same sense, most of them are dedicated to research (51,5%), 38,7% are professors, and the rest are devoted to administrative and management tasks. It is essential to note that the majority of respondents engage in teaching and research activities, as well as management and student support functions, including student tutoring, academic advising, and training in scientific vocations.

Of the professors and researchers referred to in the previous paragraph, two out of three are involved in training high-level professionals, specifically in postgraduate programs. 47% collaborate in doctoral programs and 37% in master's programs. One out of three research professors participates in bachelor's programs. 5% also reported having postdoctoral students, an activity where the student is exclusively dedicated to research activities and undertakes initiatives to disseminate science and train talent. The second part of the survey application revolves around the familiarization of the use of Artificial Intelligence AI tools, how often they have used them in their educational activities, and whether these AI tools enhance the teaching and learning processes. 85,2% of the respondents reported that they are familiar with AI for use in the classroom. In comparison, the remaining 14.8% commented that they are not familiar with AI, so they continue to carry out their teaching practice without its use. According to the frequency of mentions in the responses, the main AI tools for using them in the classroom were: learning management systems (25%) like Moodle, Blackboard or Classroom; personalized learning platforms (23%) such as Coursera, Khan Academy to mention some and, the availability of writing assistants (22%) such as Grammarly, Quillbot among others. To a lesser extent, the use of data analytics tools or learning analytics (8%) and educational chatbots (15%), such as Ada or EdTech AI. In the case of the latter, they are concrete, both in terms of the area of expertise of the teachers and in their use in teaching, publishing research results, or in terms of teacher-student interaction (Figure 1).



In the third part of the survey, we collected information about the main advantages of using AI. Based on the frequency of mentions in the responses, participants identified the following as the main advantages of using AI in the classroom (see Figure 2): access to additional educational resources (29%), support in writing and revising texts (22%), and personalization of learning (20%). Fewer participants mentioned immediate feedback (15%) and administrative efficiency (12%) as advantages.

Figure 2. Main advantages of AI



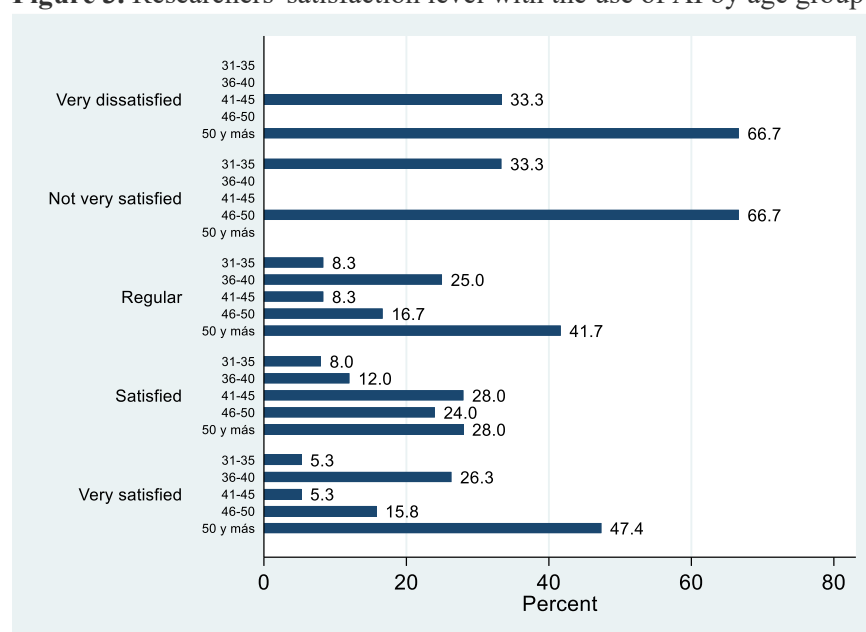
Source: Prepared by the authors, September 2024.

Note: Respondents had the option to respond to more than one of those listed.

It is essential to consider that these advantages help users to relate their teaching or research activities with students in the classroom. In other words, the use of these tools has been an advantage for teaching and learning in the Mexican educational context. In order of importance, the elements that represent challenges in the use of AI among respondents were the excessive dependence on technology (38%), lack of human interaction (24%), privacy and data security problems (24,8%), and high implementation costs (12%).

Another aspect focused on measuring user satisfaction with AI, its advantages, and the challenges it presents. Regarding user satisfaction with AI tools, it is noteworthy that only 10% do not feel satisfied or satisfied with their use and that 71% can state they are happy with the potential they have experienced using the tool. To identify patterns of behavior, the percentage distribution of satisfaction levels by age group (Figure 3).

Figure 3. Researchers' satisfaction level with the use of AI by age group

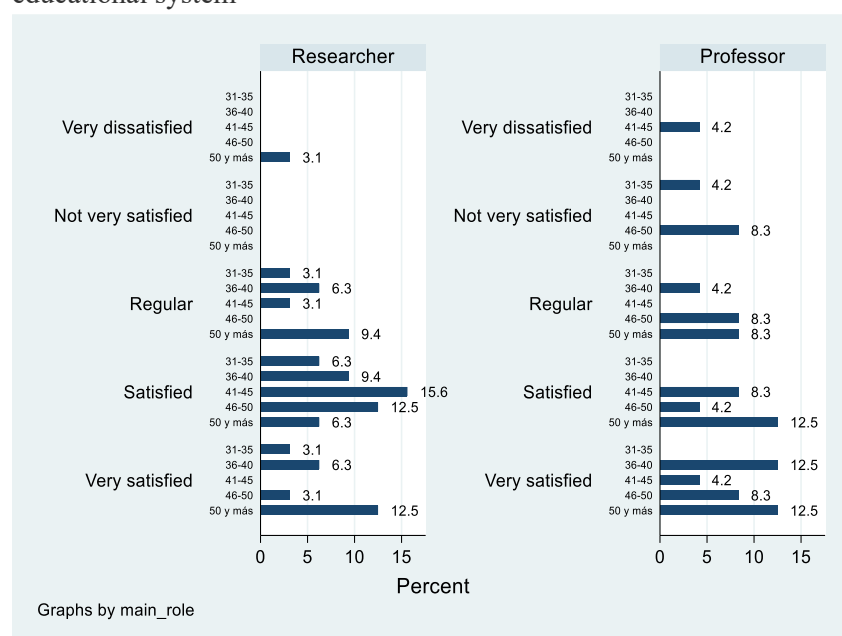


Source: Prepared by the authors, September 2024.

Note: n: number of observations in each age group.

Another essential aspect to highlight is the level of satisfaction with the use of AI, particularly with the central role that respondents assume in research, teaching, or both. 91% of the respondents mentioned that they are mainly dedicated to research or teaching, 52% and 39%, respectively; the rest indicated that their main job is management and/or administrative activities. However, it is essential to observe their testimonies regarding the level of satisfaction with the use of AI (see figure 4).

Figure 4. Level of satisfaction with the use of AI according to the central role and age group in the educational system



Source: Prepared by the authors, September 2024.

In general, there is a positive perception between both groups, with a slight overrepresentation among researchers. Additionally, teachers, researchers, and administrators anticipate a substantial increase in the use of AI tools in their daily activities over the next five years within the educational context.

Likewise, other fundamental aspects of integrating AI into the new higher education system included the timing of AI use: 38.7% of respondents reported using AI tools on a monthly basis. In comparison, 33.9% used them daily, and 21% used them rarely. Real usefulness for learning: 79% believe that the use of AI improves the teaching-learning process, 17.7% are unsure if it is better or not, and only 3% deny that it is useful, citing the challenges of technology. Mainly the excessive dependence on technology (38%), with equal responses, the lack of human interaction and privacy and security issues (24% each), and lastly the high cost of implementation (12%).

CONCLUSIONS AND IMPLICATIONS

Currently, there is a high demand for skills and competencies, both for faculty and students, to develop academic and research activities with AI. However, many of these skills and competencies are still lacking in dissemination and diffusion, which hinders their practical application in the university academic field. This research aims to demonstrate their importance at this level, particularly for the profiles of researchers in the various areas affiliated with the recently established Secretariat of Science, Humanities, Technology, and Innovation (SECIHTI). In the specialized literature, researchers have identified multiple studies that generate user confidence in the use of AI tools. In the Mexican context, university professors and researchers have positively influenced education by utilizing AI to interact with students and to conduct their scientific research, employing both constructivist and behaviorist approaches. This research empowers them with tools that promote creativity in creating images, graphics, or statistics for their work, regardless of their area of expertise. The results indicated that almost half of the research professors in Mexico benefit from AI through digital learning platforms. Furthermore, other advantages of AI include the use of web resources, proofreading tools, and text writing. More than 60% of respondents consider excessive dependence or lack of human interaction as risks of indiscriminate use of AI. However, as has been demonstrated to date, AI has errors that it gradually corrects, such as image sharpness, to name one aspect.



Overall, researchers are satisfied with the use of the tool in an environment of rapidly emerging new applications, functionalities, and use cases in academia, industry, and services. Professors teaching in higher education in Mexico are familiar with the use of AI, both in their teaching and research activities. Furthermore, technological resources and applications are proliferating and rapidly disseminating throughout the research community, allowing us to accelerate the path to obtaining the most significant benefits from AI.

This pioneering work aims to lay the groundwork for future research on the potential of AI in education, as a means to strengthen teaching-learning processes, teachers' didactic and pedagogical skills, and maximize student achievement. One limitation of this work was the limited response from researchers, resulting in a small sample size. Some of the factors contributing to this were the saturation of activities, as well as the lack of functions and a certain apathy toward participation due to a lack of knowledge about AI, which is evident in the research. It also aims to generate future lines of research to promote the ethical use of AI and disseminate its responsible application in the academic field, thereby preventing the use of anti-plagiarism tools at this academic level. It will also be necessary to implement innovative strategies and disseminate these results to influence the educational and social sectors.

In conclusion, the benefits are evident, even when considering aspects such as regulation, legislation, plagiarism, and web security. Users are generally satisfied with AI tools and have adapted to them as AI has emerged. They gain benefits from using AI, such as easy access to additional educational resources, increased administrative efficiency, and support for writing and editing texts, as well as the immediate feedback it generates.

BIBLIOGRAPHIC REFERENCES

- Ali, O., Murray, P. A., Momin, M., Dwivedi, Y. K., & Malik, T. (2024). The effects of artificial intelligence applications in educational settings: Challenges and strategies. *Technological Forecasting and Social Change*, 199, 123076. <https://doi.org/10.1016/j.techfore.2023.123076>
- Benvenuti, M., Cangelosi, A., Weinberger, A., Mazzoni, E., Benassi, M., Barbaresi, M., & Orsoni, M. (2023). Artificial intelligence and human behavioral development: A perspective on new



- skills and competences acquisition for the educational context. *Computers in Human Behavior*, 148, 107903. <https://doi.org/10.1016/j.chb.2023.107903>
- Cortez, P. M., Ong, A. K. S., Diaz, J. F. T., German, J. D., & Singh Jagdeep, S. J. S. (2024). Analyzing Preceding factors affecting behavioral intention on communicational artificial intelligence as an educational tool. *Heliyon*, 10(3), e25896. <https://doi.org/10.1016/j.heliyon.2024.e25896>
- García, O. V. (2023). Uso y percepción de ChatGPT en la educación superior. *Revista de Investigación en Tecnologías de la Información*, 11(23), Article 23. <https://doi.org/10.36825/RITI.11.23.009>
- Huerta, S., & Zavala, J. R. (2023). La Inteligencia Artificial y el Contexto de la Docencia en México. *Revista Docentes 2.0*, 16(1), 49–56. <https://doi.org/10.37843/rtd.v16i1.336>
- ILIA. (2024). Índice Latinoamericano de Inteligencia Artificial. ILIA. https://indicelatam.cl/wp-content/uploads/2025/01/ILIA_2024_020125_compressed.pdf
- INCyTU. (2018). Inteligencia artificial. https://www.foroconsultivo.org.mx/INCyTU/documentos/Completa/INCYTU_18-012.pdf
- McCarthy, J. (1960). Recursive functions of symbolic expressions and their computation by machine, Part I. *Commun. ACM*, 3(4), 184–195. <https://doi.org/10.1145/367177.367199>
- Michel-Villarreal, R., Vilalta-Perdomo, E., Salinas-Navarro, D. E., Thierry-Aguilera, R., & Gerardou, F. S. (2023). Challenges and Opportunities of Generative AI for Higher Education as Explained by ChatGPT. *Education Sciences*, 13(9), Article 9. <https://doi.org/10.3390/educsci13090856>
- Minsky, M. (1988). *Society Of Mind*. <https://www.simonandschuster.com/books/Society-Of-Mind/Marvin-Minsky/9780671657130>
- Onofre, P. J., Hinojos, J. M. O., Morales, G. R., Ávila, E. M., Leal, A. F., & Jimenez, B. A. (2024). Educational Innovation in Mexico: Enhancing Learning with Artificial Intelligence, Applying ChatGPT in Higher Education Institutions, Professor-Student Collaboration. *Ciencia Latina Revista Científica Multidisciplinar*, 8(3), Article 3. https://doi.org/10.37811/cl_rcm.v8i3.11819



- Papert, S. (1980). *Mindstorms: Children, computers, and powerful ideas*. Basic Books, Inc.
- Shumailov, I., Shumaylov, Z., Zhao, Y., Papernot, N., Anderson, R., & Gal, Y. (2024). AI models collapse when trained on recursively-generated data. *Nature*, 631(8022), 755–759.
<https://doi.org/10.1038/s41586-024-07566-y>
- Skinner, B. F. (2016). *The Technology of Teaching*. B. F. Skinner Foundation.
<https://www.amazon.com/Technology-Teaching-Skinner-Foundation->
Reprint-ebook/dp/B01ETTGUPQ
- SECIHTI. (2025). Archivo Histórico del SNII [Oficial]. SECIHTI. <https://secihti.mx/sistema-nacional-de-investigadores/archivo-historico/>
- SECIHTI. (2025). Padrón de Beneficiarios. Sistema Nacional de Investigadoras e Investigadores.
<https://secihti.mx/sistema-nacional-de-investigadores/padron-de-beneficiarios/>
- Tramallino, C., & Marize, A. (2024). Avances y discusiones sobre el uso de inteligencia artificial (IA) en educación. *Educación*, 33(64), Article 64.
<https://doi.org/10.18800/educacion.202401.M002>
- Turing, A. M. (2021). *On Computable Numbers, with an Application to the Entscheidungsproblem* (1936). <https://direct.mit.edu/books/edited-volume/5003/chapter/2657029/On-Computable-Numbers-with-an-Application-to-the>
- Zumba, L. J., Tolozano, M. R., Vidal Montaña, V. M., & Figueroa Corrales, E. (2023). Estrategia de superación docente sobre la herramienta de inteligencia artificial CHAT GPT. *Polo del Conocimiento: Revista científico - profesional*, 8(10 (OCTUBRE 2023)), 552–576.
<https://dialnet.unirioja.es/servlet/articulo?codigo=9205934>

