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Abstract: Artificial intelligence (AI) is transforming education by introducing tools and technologies that optimize teaching and learning processes. The main uses and advances of AI in education are related to topics such as: The personalization of learning, with the use of various AI platforms, adaptive tutoring solutions, and personalized curricula; Automation of administrative tasks, enabling automatic grading and academic management processes, thus streamlining scheduling and course registration processes, allowing teachers to devote more time to teaching; Improving accessibility, with the use of real-time translation tools and voice and text recognition; Solutions that facilitate the analysis and prediction of student performance, identifying risks and making data-driven decisions; Immersive learning, with the use of virtual reality tools and interactive simulations; The creation of educational content, and teacher training and development. Despite the appeal of using AI, there are challenges related to the uncertainty of its use and a lack of knowledge about existing tools and their ethical use. Thus, the problem lies in recognizing the challenges and the importance of generating training alternatives to maximize knowledge and proper use of AI tools, improving school performance and teacher performance, striking an appropriate balance between technology and skills such as creativity and ingenuity. The objective is to identify the percentage of students in an engineering group who are knowledgeable about and use new technologies with artificial intelligence for their professional training. A study was conducted with a group of higher-level engineering students at the Technological Institute of Los Mochis, Sinaloa, Mexico. A questionnaire-type instrument was applied, and the data were analyzed qualitatively. The results show that, although most students claim to be familiar with the concept of AI, a low percentage of students use specific AI tools and have little knowledge of the benefits.

Keywords: Artificial Intelligence (AI), AI Platforms, Learning Personalization, Adaptive Tutoring, Personalized Study Plans, Automation of Administrative Tasks, Immersive Learning.

Abstract: Artificial intelligence (AI) is transforming education by introducing tools and technologies that optimize teaching and learning processes. Thus, the main uses and advances of AI in the educational field are related to topics such as: The personalization of learning, with the use of various AI platforms, or adaptive tutoring solutions and personalized study plans; The automation of administrative tasks, enabling automatic grading processes and academic management, thus streamlining the assignment of schedules and course registration processes, allowing teachers to dedicate more time to teaching; Improving accessibility, with the use of real-time translation tools and voice and text recognition; Solutions that facilitate the analysis and prediction of student performance, identifying risks and making data-based decisions; Immersive learning, with the use of virtual reality tools and interactive simulations; The creation of educational content, and teacher training and education. Faced with the attractiveness of the use of AI, there are challenges related to the uncertainty of its use and the lack of knowledge of existing tools and their ethical use. In this way, the problem is framed in the recognition of the challenges and the importance of generating training alternatives to maximize the knowledge and adequate use of AI tools, improving school performance and teaching performance, in an adequate balance between technology and skills such as creativity and ingenuity. This is how the objective of the research focuses on knowing if a group of Engineering students have knowledge and use new technologies with AI for their professional training. Thus, a study is carried out with a group of higher-level Engineering students, at the Los Mochis Technological Institute, Sinaloa, Mexico. A questionnaire-type instrument was applied, and the data were analyzed qualitatively. The result shows that most students, even though they claim to know the concept of AI, on the other hand, a low percentage of students who use specific AI tools, and low ignorance of the benefits, is observed.

Keywords: Artificial Intelligence (AI), AI platforms, Personalization of learning, adaptive tutoring, Personalized study plans, Automation of administrative tasks, Immersive learning.

INTRODUCTION

The use of artificial intelligence has been gradually implemented since the middle of the last century, with the emergence of technological tools such as fax machines, printers, machines, data manipulation systems, etc., which marked the beginning of the development of more sophisticated technology for solving problems in all areas of human life. However, in recent years, it has revolutionized everyday life in many areas, and its use still causes uncertainty due to a lack of knowledge about all the tools that exist and whether its implementation is appropriate and ethical in many of the activities carried out by higher education students in their schoolwork. It is very important to set aside prejudices and provide training in its use, as well as in the correct use of new technologies that improve students' academic performance, promoting these cutting-edge trends and facing new challenges to improve their school life, enabling them to become professionals with an understanding of the skills involved in using technological tools designed with artificial intelligence capabilities, while without neglecting the human side, such as creativity, hard work, and ingenuity, which are some important aspects for excelling in this globalized, digitized, and rapidly changing world. A study was conducted with a group of higher education engineering students in Los Mochis, Sinaloa, Mexico. A questionnaire was administered, and the data was then analyzed qualitatively.

The objective is to identify the percentage of students in an engineering group who have knowledge of and use new technologies with artificial intelligence for their professional training.

The study of knowledge and use of new technologies with artificial intelligence is very important because there is currently a progressive use of these tools by higher education students. "Since its inception, artificial intelligence has gone through different stages; some with enormous motivation and abundant funding for research, and others with little belief in its achievements" (Sanabria, et al. 2023). It is very important to define that artificial intelligence (AI) refers to the ability of a computer or machine to perform tasks that would normally require human intelligence, such as learning, problem solving, decision making, etc.

DEVELOPMENT

The future of higher education and teaching with online technology, specifically adaptive learning and analysis infused with AI software, is increasingly developing and maturing in these types of teaching.

teaching environments. Meanwhile, new educational models can be enablers and drivers of the use of AI systems in educational contexts, generating opportunities for students to use them and adopt AI in educational applications that increase students' learning skills through practices that develop the use of AI-enabled techniques, while facilitating teaching and learning performance in higher education, taking advantage of the fact that this analysis of learning tactics and strategies in an online environment is a form of pedagogical support to partner with students in the development of novel content (Sanabria, et al., 2023).

That is why AI has advanced by leaps and bounds in recent decades, transforming various areas of society, including education, where it has acquired a solid scientific foundation and produced many successful applications. Similarly, its rapid advancement has important implications for learning and teaching, where AI-mediated teaching is expected to transform higher education, offering significant opportunities to improve learning when integrated into it. For transformative teaching, this integration of AI can bring enormous benefits and help teachers identify the needs of their students so that they can determine the most appropriate content and learning activities (Vera, 2023).

AI tools used

Some tools that can be used for learning in higher education include virtual assistants, computer programs capable of interacting with users of a site or service in their own language in order to answer students' questions through tools such as keyword search and machine learning for bot training. One example is chatbots, whose educational purpose is to promote student teaching and learning through tutoring or through skill practice and exercise programs (Rubio, 2022, p. 87).

Likewise, virtual online learning platforms, known as LMS (Learning Management Systems), allow teachers to create and distribute educational content, interact with students, and measure and evaluate their progress. They are also known as virtual educational platforms, virtual classrooms, platforms, e-learning platforms, and teaching platforms, among others (Badillo, 2024).

Along these lines, adaptive content can be designed to suit the level and progress of each student through personalized learning, which is an educational approach that seeks to adapt the teaching and learning process to the characteristics, needs, and interests of each student, involving them in choices about what, how, when, and where to learn. taking into account their learning styles, pace, and preferences, with many benefits such as motivation, commitment, understanding, and academic performance. It also facilitates the work of teachers by allowing for better attention to diversity and greater efficiency in the use of educational resources. It provides personalized tutoring to students through intelligent functions that simulate a human role (e.g., a teacher, peer, or mentor) and interact with students through text or voice, giving instructions, offering advice, answering questions, or providing feedback (Ruiz & Ruiz, 2024).

As for automatic assessment tools, these are software programs that use machine learning algorithms to automatically grade student assignments, quizzes, assessments, and exams (Hey, 2024). There are also online collaboration tools that enable smarter and more efficient project management, streamlining the process with innovation and training teams to work seamlessly (Klaxoon, n.d.).

Others include online courses with augmented or virtual reality, which combine digital or virtual elements with real-life elements, presenting an environment in which they truly develop and, through an electronic device, creating an augmented reality that is updated in real time (EvolMind, n.d.). Added to this is data analysis in higher education, which serves to analyze large amounts of data and process it for understanding and better decision-making.

Data privacy and security

A very important point is that when using AI tools, platforms, programs, educational networks, tools, and applications as educational resources or environments, a significant challenge is data privacy and security. AI, which is based on the analysis and processing of large amounts of data, raises concerns about the protection of privacy and information security (Vera, 2023).

One of the points of the Beijing Consensus on Artificial Intelligence and Education points out that it must be taken into account that artificial intelligence applications can impose different types of

biases inherent in the data that feeds the technology, as well as in the way processes and algorithms are constructed and used. Addressing the dilemmas posed by the balance between open access to data and data privacy protection, bearing in mind the legal issues and ethical risks related to data ownership and privacy and its availability for the public good, as well as the importance of adopting principles related to ethics, privacy, and security as part of the design (UNESCO. Artificial Intelligence and Education, 2021).

Current and future artificial intelligence systems will facilitate the laborious tasks performed by engineers. That is why today's students must be familiar with these tools, as the uncertain future of technology demands versatile engineers who can use artificial intelligence with different skill sets (Artificial Intelligence: Future in Engineering, 2024). The eleven-question questionnaire was administered as a data collection tool to a group of engineering students in Los Mochis, Sinaloa, Mexico, to find out if a group of students are familiar with and use new technologies with artificial intelligence, with a population and sample of 41 students. A questionnaire was designed based on the analysis of research related to the topic and a review of the available literature. Closed questions were used, with a final question offering a choice of different options, in order to give students the opportunity to openly express other answers if none of the options provided were appropriate. This questionnaire was administered through personal interviews with members of the study group.

The data collection procedure was carried out through literature research in virtual libraries and on the internet, as well as field research by administering a questionnaire to engineering students. For the data analysis, a percentage was assigned to each response. The results obtained were as follows:

Graph 1. Knows what AI is.

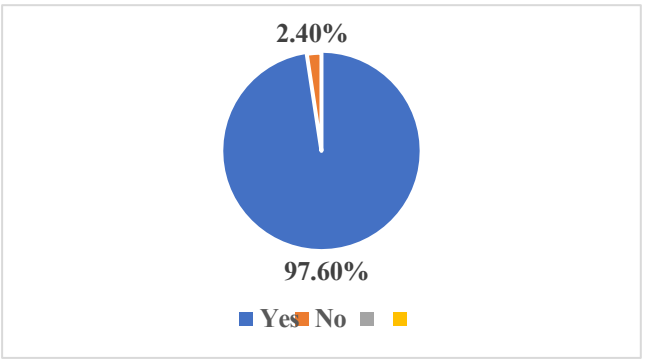
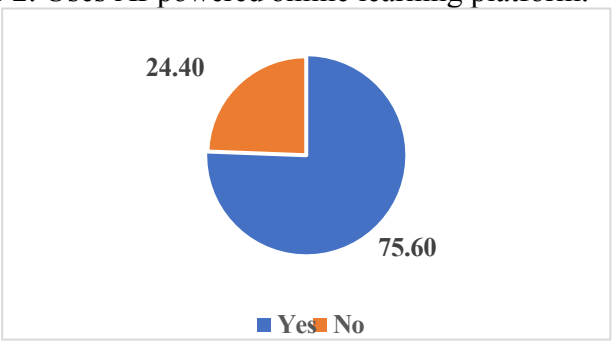


Figure 1 shows that 97.60% of students know what AI is and 2.40% do not. It can be seen that almost 100% of students know what Artificial Intelligence is.

This is due to the enormous advances that have been made in recent times, transforming various areas of society, including education (Vera, 2023).

Figure 2. Uses AI-powered online learning platform.



Graph 2 shows that 24.40% of students use AI-based online learning platforms and 75.60% do not, due to the rise in the use of classrooms or educational platforms designed with adaptive learning content that has been adapted to the teaching-learning process in higher education (Ruiz & Ruiz, 2024).

Graph 3. Familiarity with automatic assessment tools used in courses.

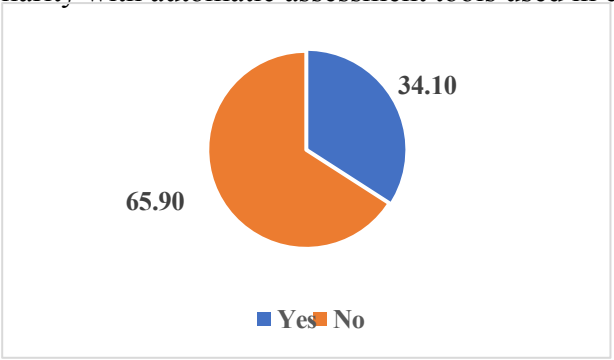


Figure 3 shows that 34.10% of students are familiar with the automatic assessment tools used in courses, while 65.90% are not. Based on the above, it can be understood that most students have not used these machine learning algorithms to automatically grade assignments, quizzes, assessments, and exams.

Figure 4. Has used virtual assistants to obtain academic help.

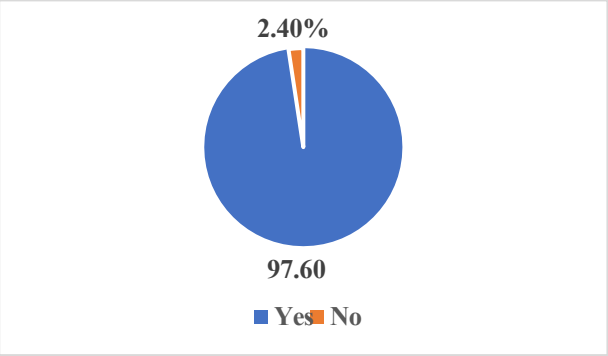


Figure 4 shows that 97.60% of students have used virtual assistants for academic help and 2.40% have not. There are also online collaboration tools that enable smarter and more efficient project management, streamlining the process with innovation and training teams to work seamlessly (Klaxoon, n.d.).

Others include online courses with augmented or virtual reality, which combine digital or virtual elements with real-life elements, presenting an environment in which they truly develop and, through an electronic device, creating an augmented reality that is updated in real time (EvoldMind, n.d.). Added to this is data analysis in higher education, which is used to analyze large amounts of data and process it for understanding and better decision-making.

Graph 5. Learn about personalized learning with AI.

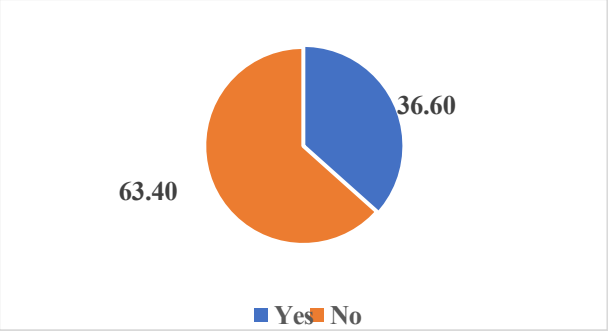


Figure 5 shows that 36.60% of students know what AI-powered personalized learning is, while 63.40% do not.

Figure 6. Has used online educational resources that incorporate AI.

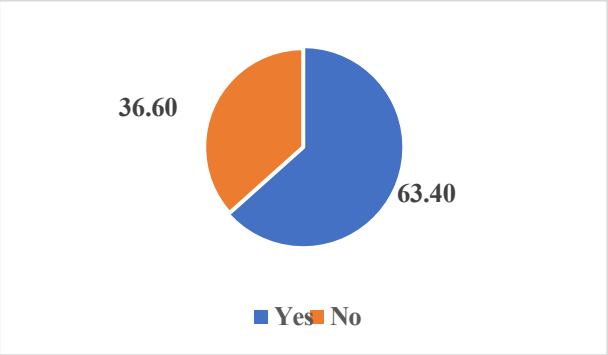


Figure 6 shows that 63.40% of students have used online educational resources that incorporate AI and 36.60% have not.

Figure 7. Has participated in an online course that uses augmented or virtual reality.

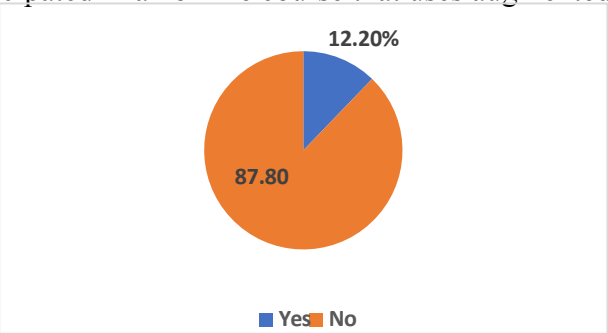


Figure 7 shows that 12.20% of students have participated in online courses that use augmented or virtual reality, while 87.80% have not.

Figure 8. Learn how data analysis works in higher education.

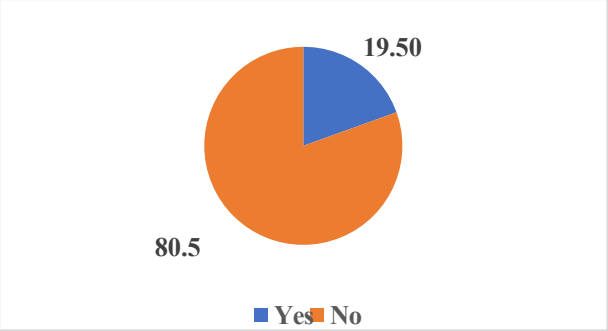


Figure 8 shows that 19.50% of students know how data analysis works in higher education and 80.50% do not.

Figure 9. Has used online collaboration tools with AI.

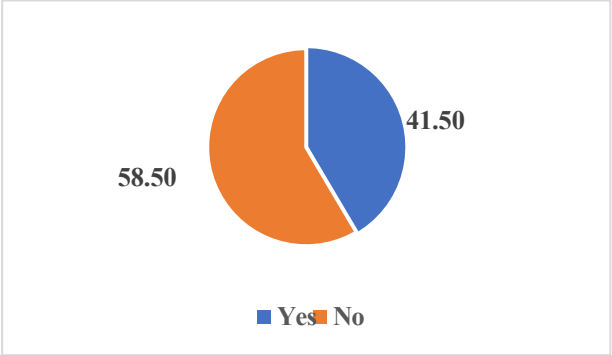


Figure 9 shows that 41.50% of students have used online collaboration tools with AI and 58.50% *have not.*

Figure 10. Knows how to protect their privacy in AI learning environments.

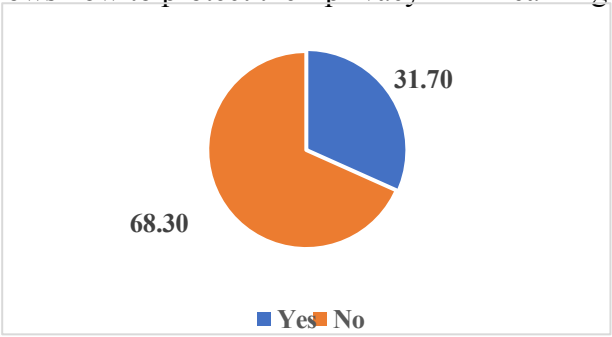


Figure 10 shows that 31.70% of students know how to protect their privacy in AI learning environments and 68.30% do not.

Figure 11. Has used educational simulations with AI.

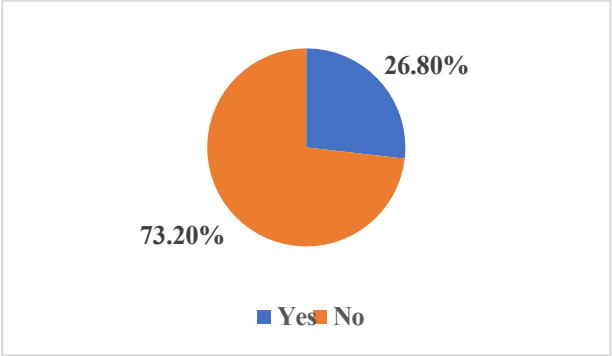


Figure 11 shows that 26.80% of students have used educational simulations with AI and 73.20% have not.

Figure 12. Basic knowledge and use of AI tools.

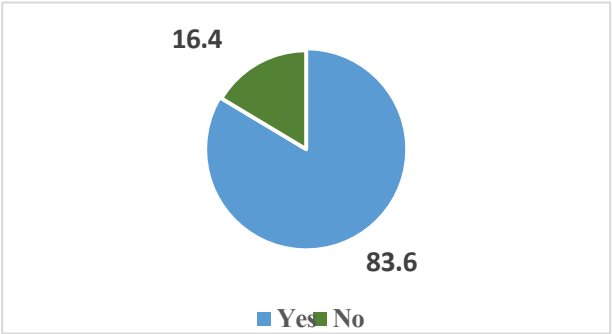


Figure 12 indicates that 83.6% of students have basic knowledge of AI, theoretically related to common terminology, as well as the use of basic and everyday tools. On the other hand, only 16.4% say they have no knowledge of AI or the use of basic tools to support academic or personal tasks.

Graph 13. Use of specific AI tools and knowledge of benefits

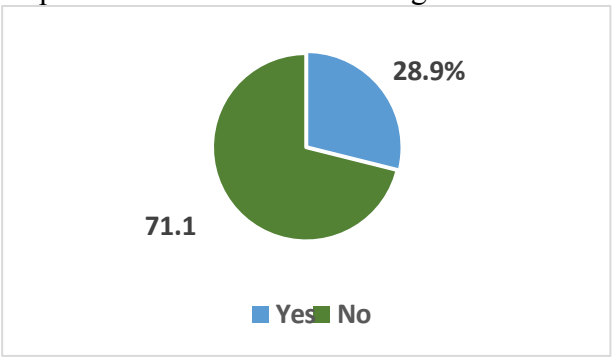


Figure 13 shows a low percentage of AI tool usage for specific tasks in certain contexts. Only 28.9% of students indicate that they use AI tools to help solve different problems and understand the importance and benefits of using this technology correctly. Unfortunately, 71.1% of students are unaware of the advantages and importance of these technological tools in these competitive times, and therefore do not use them or experiment with new ways of working in academic, professional, personal, and other contexts.

Table 1. New technology tools with artificial intelligence that students are familiar with or have used to improve or help them learn more as students.

Table 1. New Technology Tools with Artificial Intelligence

AI tool	No. of students	Percentage
ChatGPT	4	97.6
Wolfram Alpha	23	56.1%
Gamma	11	26.8
Grammarly	7	17.1
Gemini	7	27.1
Copilot	6	14.6

With a percentage of less than 8%, the following were mentioned: Socratic, Cite This for Me, Copyspace, Zotero, Meta Al, Symbolab, and Calc.

- ChatGPT is software that functions as a digital conversation robot. Its objective is to provide users with answers to any question based on content available on the internet (Diego et al., 2023).
- Wolfram Alpha is a calculation and graphing tool developed using mathematics that allows users to solve, consult, and analyze problems and questions in disciplines as diverse as mathematics, medicine, chemistry, culture, music, education, etc. (Gonzalez et al., 2018).
- Gamma creates presentations, documents, and websites. No design or coding knowledge is required (GAMMA. A new way to present ideas, 2024).
- Grammarly is an online writing assistance tool from Grammarly that teaches correct grammar, proper citations, and effective communication. It provides suggestions while you write in desktop applications and websites, as you move between applications, social networks, documents, messages, and emails (Gomez, 2024).
- Unlike traditional models that focus on a single data modality (such as text or image), Gemini is multimodal, processing and understanding information from multiple sources, such as text, images, videos, and even code. This capability opens up a range of possibilities for innovative applications in various sectors (Gemini: What it means for the future of AI, 2024).

- Copilot is an artificial intelligence tool integrated into Microsoft 365, specifically designed to boost your productivity when using these applications. This revolutionary technology is available across the entire Microsoft Office suite, including Word, Excel, OneNote, PowerPoint, and Teams, among others (Valero, 2024).

Although it is still a tool in development, susceptible to errors and imperfections, and is in the mass testing phase, the quality of its responses has pleasantly surprised users: it is capable of creating content; quickly responding to questions on topics as diverse as writing songs and poems; performing calculations, programming codes, essays, writing about general knowledge, and so on.

DISCUSSION AND ANALYSIS OF RESULTS

Based on this research and as a result of processing the data obtained in the fieldwork carried out, the results of the investigation are presented. These results are analyzed using a selective approach, and the summary allows these results to be effectively linked to the stated objective. Thus, with regard to the objective of the research, which was to identify the percentage of students in an engineering group who have knowledge of and use new technologies with artificial intelligence for their professional training, the results obtained are presented in summary form, in particular in Figure 12. shows that with regard to basic knowledge and use of AI tools, 83.6% of students respond affirmatively that they know how to use these tools in a basic way. With this, it is possible to assume that these tools have a positive impact on their professional training. However, in Figure 13, it can be seen that with regard to the survey on the use of specific AI tools and knowledge of their benefits, the results show that 71.1% of students are unaware of the benefits of using specific AI tools. The results clearly show that students have basic knowledge of AI, but they do not have the necessary knowledge and skills in specific AI tools to enhance their professional training.

CONCLUSIONS

The research starts from the recognition of the importance of AI in the educational process, which is why it is essential to identify the knowledge that exists and the level of use of these tools by the actors in this process, whether they are students or teachers, and how these tools are used.

for support in their professional training. This defines the central question of the research in line with the objective, which is to identify the percentage of students in an engineering group who have knowledge of and use new technologies with artificial intelligence for their professional training. Based on the evidence obtained, it is first observed that, although a significant percentage of the student population surveyed has knowledge of basic AI concepts and tools, it is also clear that this knowledge does not translate into the skills necessary for its use to benefit the students' professional training. Therefore, based on the results obtained from the student population in which the research was conducted, the following conclusions can be drawn: Even though students have knowledge of AI tools and their possible uses, this knowledge is not sufficient to benefit their professional training. Therefore, there is a need for effective training in AI tools for students and teaching staff, aimed at maximizing the use of AI tools in their professional training.

A second conclusion addresses the personalization of learning. While the potential of AI tools is recognized, made possible by a general approach and effective training for participants in the teaching and learning process, the diversity of student profiles is also recognized. Students have a variety of characteristics, skills, experiences, and needs that are evident in the classroom, which leads to the need to implement educational inclusion scenarios for active participation in learning and development.

FUTURE WORK

Based on this research, the aim is to provide training in the use of specific technological tools that use AI to perform different tasks that strengthen students' academic and professional training, as well as to carry out research aimed at teachers with the aim of determining the degree of knowledge and application of new AI technologies.

A second approach relates to AI research in education, addressing the need to tackle AI research in education related to the personalization of learning, including: AI research where content, pace, and teaching style are adapted to student needs; Use of AI to suggest personalized materials according to the student's profile and progress; Use of AI for the analysis of learning styles.

based on the student's profile and progress; Use of AI for the analysis of learning styles.

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COLLABORATIVE WORK TABLE

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Writing - Review and editing	Carmen María González Rodríguez, Juan Andrés Miranda Arnold
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