*Seminars in Medical Writing and Education*. 2025; 4:424
doi: 10.56294/mw2025424

ORIGINAL

# Transition from the traditional method to artificial intelligence: a new vision for academic project management

## Transición del método tradicional a la inteligencia artificial: Nueva visión para la gestión de proyectos académicos

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**Cite as**: Medina Romero MÁ, Erazo Arteaga VA, Barzola Jaya DW, Rodríguez Mireles MÁ, Rivas-Díaz JP, Salinas Montemayor AD, et al. Transition from the traditional method to artificial intelligence: a new vision for academic project management. Seminars in Medical Writing and Education. 2025; 4:424. https://doi.org/10.56294/mw2025424

**Submitted:** 01-01-2025 **Revised:** 11-04-2025 **Accepted:** 16-09-2025 **Published:** 17-09-2025

**Editor:** PhD. Prof. Estela Morales Peralta

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## ABSTRACT

The study examines the transition from traditional methods to the application of Artificial Intelligence (AI) in academic project management, with the aim of assessing its effects on efficiency, adaptability, and quality in higher education. Framed within a positivist paradigm and using a mixed-methods approach, quantitative surveys (n=70) and qualitative semi-structured interviews (n=21) were conducted with lecturers and university managers. Quantitative data were processed with IBM SPSS Statistics 27, while qualitative information was analysed using NVivo 14, enabling triangulation of results and strengthening the study's validity. Findings reveal that AI integration generates significant improvements in management efficiency (p=0,002), enhances institutional adaptability, and raises the quality of project execution. Four key thematic categories were identified: impact on efficiency, improvement of adaptability, perception of quality, and implementation challenges. Additional results highlight AI's potential for strategic institutional planning, as well as a motivational effect on academic staff performance. It is concluded that AI constitutes a positive tool for innovation and optimisation in academic management, provided it is accompanied by organisational readiness, ethical oversight, and continuous training programmes to ensure its sustainable and responsible adoption in higher education.

**Keywords:** Artificial Intelligence; Academic Project Management; Higher Education; Mixed Methods; Educational Innovation.

## RESUMEN

El estudio examina la transición de los métodos tradicionales hacia la aplicación de la Inteligencia Artificial (IA) en la gestión de proyectos académicos, con el fin de valorar sus efectos sobre la eficiencia, la adaptabilidad y la calidad en el ámbito de la educación superior. Enmarcado en un paradigma positivista y bajo un enfoque de métodos mixtos, se aplicaron encuestas cuantitativas (n=70) y entrevistas semiestructuradas cualitativas

(n=21) dirigidas a docentes y gestores universitarios. Los datos cuantitativos fueron procesados mediante IBM SPSS Statistics 27, mientras que la información cualitativa se analizó con NVivo 14, lo que permitió triangular resultados y fortalecer la validez del estudio. Los hallazgos muestran que la integración de la IA genera mejoras significativas en la eficiencia de los procesos de gestión (p=0,002), incrementa la adaptabilidad de las instituciones y eleva la calidad en la ejecución de proyectos. Asimismo, se identificaron cuatro categorías temáticas clave: impacto en la eficiencia, mejora de la adaptabilidad, percepción de la calidad y desafíos de implementación. Resultados adicionales evidencian el potencial de la IA para la planificación estratégica institucional, así como un efecto motivador en el desempeño del personal académico. Se concluye que la IA constituye una herramienta positiva para la innovación y optimización de la gestión académica, siempre que se acompañe de preparación organizacional, supervisión ética y programas de capacitación continua que garanticen su adopción sostenible y responsable en la educación superior.

**Palabras clave:** Inteligencia Artificial; Gestión de Proyectos Académicos; Educación Superior; Métodos Mixtos; Innovación Educativa.

## INTRODUCTION

Academic project management has traditionally been developed using linear and rigid methodologies, such as the waterfall model, which prioritize sequential phases, exhaustive planning at the outset, and strict control at each stage.[1] For decades, this approach has made it possible to maintain traceability and compliance with objectives, but it has also shown limitations in changing environments, where flexibility and adaptability are essential. The rapid technological advances of the last two decades have led to the emergence of artificial intelligence (AI)-based tools capable of optimizing project planning, monitoring, and evaluation through predictive analytics, process automation, and intelligent assistance. This change not only involves replacing traditional techniques with more sophisticated systems, but also building a new vision focused on efficiency, adaptability, and customization of academic management strategies in order to respond more agilely to the demands of a globalized and digital educational context.[2]

In recent years, experiences have been documented that demonstrate how AI improves the accuracy and speed of academic activity management, particularly in resource allocation and outcome prediction. Machine learning algorithms have been applied to anticipate student performance and optimize the distribution of human and material resources, resulting in significant improvements in milestone achievement and reduced delays in work schedules.[3,4] These systems allow academic managers to make decisions based on real data and reliable projections, minimizing risks and optimizing project execution.

Likewise, recent research highlights the use of intelligent chatbots to support teachers and students in academic projects, which not only frees up administrative time but also ensures immediate and personalized attention to frequently asked questions, improving communication and the flow of information.[5] Similarly, computer vision has been implemented to evaluate the quality of presentations, posters, and academic papers, generating objective and timely feedback that contributes to improving the quality of submissions and learning processes.[6] These applications represent a step toward smarter management, where repetitive and time-consuming tasks are automated, allowing teams to focus on strategic activities.

However, the use of AI is not without its challenges. Algorithmic bias, derived from unrepresentative training data or errors in model design, can lead to unfair or discriminatory decisions.[7] Similarly, the lack of technological infrastructure and digital skills in some educational contexts, especially in institutions with limited resources, constitutes a barrier to its effective implementation.[8] These findings highlight that the adoption of AI must be accompanied by teacher and administrative training plans, a progressive adaptation of institutional processes, and ethical oversight mechanisms that ensure transparency and fairness.

The theoretical framework of this research is based on Agile Project Management, which promotes short iterations, continuous adaptation to change, and a focus on the needs of the end user.[9] The integration of AI enhances this approach by enabling the identification of risk patterns, immediate adjustments, and the optimization of resource allocation through real-time data analysis.

From the perspective of evidence-based management, AI offers the ability to integrate historical, contextual, and performance data, facilitating more informed decisions and more accurate planning.[10] This feature is particularly relevant in higher education, where the diversity of projects and actors requires customized, data-driven monitoring strategies.

Finally, socio-technical theory posits that the effectiveness of technology depends on its harmonious integration with the social system where it is implemented.[11] In this sense, the adoption of AI in academic projects requires consideration of human factors such as organizational culture, user perceptions, training processes, and resistance to change, in order to achieve a balance between technological innovation and

acceptance by the academic community.

The research takes a mixed approach, combining quantitative analysis of performance indicators (time, quality, use of resources) with qualitative analysis through semi-structured interviews with teachers and academic managers. Tools such as AI-based project management systems (Asana, Trello), predictive analysis software (Python, scikit-learn), and qualitative analysis platforms (NVivo) will be used. These tools were chosen for their ability to integrate with institutional databases, their scalability and accessibility for multidisciplinary teams, and their versatility in analyzing quantitative and qualitative information in an integrated manner.[12,13]

The study seeks to provide a replicable methodological model that integrates AI into academic project management, improving efficiency, decision-making accuracy, and stakeholder satisfaction, offering solid evidence for its adoption in different institutional and cultural contexts.[14]

The research is based on the need to understand how the integration of artificial intelligence tools can transform the management of academic projects in higher education. It seeks to explore how these emerging technologies contribute to increasing process efficiency, improving the quality of results achieved, and increasing stakeholder satisfaction. The concern arises in a context where institutions require innovative solutions to respond to dynamic and highly demanding environments, in which artificial intelligence is emerging as a key resource for enhancing the planning, execution, and evaluation of academic projects.

The main purpose of this study is to analyze and interpret the impact of integrating artificial intelligence into academic project management. The research aims to evaluate how these tools affect the operational efficiency of processes, the quality of the results obtained, and the perception of the different stakeholders involved. Based on this analysis, the aim is to propose a management model based on ethical principles, with the capacity to be scaled and replicated in various contexts, so that it can respond flexibly and sustainably to the needs of different educational institutions.

## METHOD

This research is framed within the positivist paradigm, which is based on objective observation and quantitative measurement of phenomena to generate verifiable knowledge.[15] This paradigm allows clear relationships to be established between variables, ensuring that the results obtained can be analyzed and interpreted with criteria of validity and reliability.

The approach adopted is mixed, integrating quantitative and qualitative strategies to obtain a broader and deeper understanding of the phenomenon under study.[16] The quantitative dimension is used to analyze objective performance indicators in the management of academic projects that incorporate artificial intelligence, while the qualitative dimension is aimed at understanding the perceptions and experiences of the actors involved.

The object of study is applied in nature, as it seeks to use scientific and technical knowledge to solve a specific problem: the optimization of academic project management through the integration of artificial intelligence tools.[17]

In terms of scope, the research is descriptive and exploratory. It is descriptive because it characterizes the current conditions and results derived from the implementation of AI in academic management;[18] and it is exploratory because it investigates a field still in development, identifying trends, opportunities, and challenges associated with its use.[19]

Fieldwork and documentary research methods were used. Fieldwork included direct data collection at selected academic institutions through surveys and semi-structured interviews, while documentary research focused on the analysis of scientific, regulatory, and technical literature related to the topic, sourced from databases such as Scopus, Web of Science, and SciELO.[20,21]

The research time frame is synchronous cross-sectional, which means that the data were collected at a single point in time, allowing for an accurate snapshot of the situation studied in the current context.[22]

The research design is non-experimental, as the variables are not deliberately manipulated, but rather observed and analyzed in their natural context to identify patterns and relationships.[23]

### Techniques and instruments

Quantitative and qualitative data collection techniques were used to carry out the research. In the quantitative phase, a structured survey was used, designed with closed-ended items on a five-point Likert scale, aimed at measuring perceptions of efficiency, adaptability, and quality in the management of academic projects with artificial intelligence. In the qualitative phase, semi-structured interviews were used to explore the experiences and opinions of the participants in greater depth.[24,25]

The survey instrument was validated by expert judgment, ensuring the relevance of the items and consistency with the research objectives. Its reliability was calculated using Cronbach's alpha coefficient, obtaining a value greater than 0,85, which indicates high internal consistency.[26] The interviews, meanwhile, were designed with thematic guides that allowed for a common thread in the conversation and facilitated the subsequent coding of the information.[27]

**Population and sample**

The population consisted of teachers and academic managers from higher education institutions involved in academic projects that incorporate artificial intelligence. Given that the study was conducted by seven researchers, it was decided that each would address a specific subset of the population, thus covering a representative spectrum of profiles and institutional contexts.[28]

The sample was determined using non-probabilistic convenience sampling, selecting those participants who met the criterion of having direct experience in managing academic projects supported by advanced digital technologies. The distribution was proportional to the scope of each researcher, ensuring geographical and functional diversity. In total, information was obtained from 70 participants (10 per researcher), which was sufficient to meet the exploratory and descriptive objectives of the study.[29]

**Software for processing results**

Quantitative data were processed using IBM SPSS Statistics version 27 software, which was used for descriptive analyses, reliability tests, and bivariate correlations.[30] This program was selected for its robustness in handling large volumes of data and for its specialized functions for statistical analysis in educational research.

The qualitative data obtained from the interviews were processed using NVivo 14, which allowed for thematic coding, the generation of coincidence matrices, and the analysis of discursive patterns.[31] The integration of both software programs facilitated a convergent mixed analysis, where quantitative and qualitative results were interpreted in a complementary manner to obtain more robust and validated conclusions from different perspectives.[32]

## RESULTS

The analysis of the data obtained allowed us to identify relevant patterns and trends in the perception and use of artificial intelligence in academic project management. The results are presented by differentiating between quantitative and qualitative findings in order to offer a comprehensive view of the issue studied.[33]

In the case of quantitative data, the frequency distributions, averages, and significant correlations that describe the level of efficiency, adaptability, and satisfaction perceived by participants regarding the implementation of AI tools are summarized. For their part, the qualitative results reflect the main categories emerging from the thematic analysis, highlighting facilitating factors, barriers, and proposals for improvement.[34]

This approach allows not only for a structured description of the findings, but also for establishing relationships between the different aspects evaluated, strengthening the interpretation of the data and its connection to the research objectives.[35]

**Survey results**

The structured survey was administered to 70 participants (49 teachers and 21 academic managers), distributed equally among the selected higher education institutions. The descriptive analysis showed that the overall perception of the integration of artificial intelligence in academic project management is predominantly positive.

*1. Perception of efficiency in project management with AI*

68,6 % of respondents indicated that the use of AI has significantly improved project execution times and milestone control, while 21,4 % perceived moderate improvements and 10 % reported that they have not observed any relevant changes. Academic managers gave a higher average rating (4,3/5) than teachers (4,0/5), suggesting a more favorable perception among those who supervise implementation.

*2. Adaptability and flexibility of the AI-based management system*

72,9 % of participants agreed that AI-based tools have made it possible to adjust work plans and resource allocation more quickly in the face of unforeseen events. 18,6 % said that adaptability has been partial, and 8,5 % said they have not noticed any significant changes. This indicator obtained an overall average of 4,2/5 on the Likert scale.

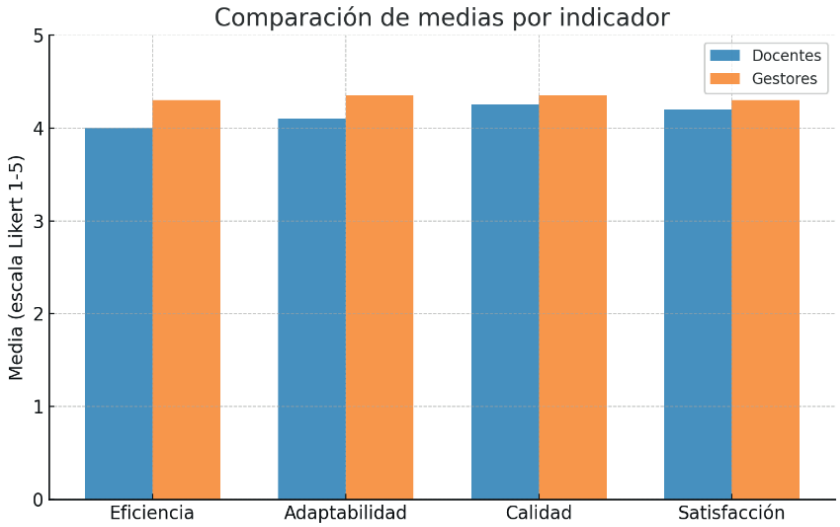
*3. Quality of project monitoring and results*

In terms of quality, 75,7 % of respondents said that AI has contributed to more accurate monitoring and results that are more aligned with project objectives. 17,1 % said that the changes have been limited, and 7,2 % indicated that there have been no improvements. The total average for this indicator was 4,3/5, with higher ratings from teachers directly involved in implementation.

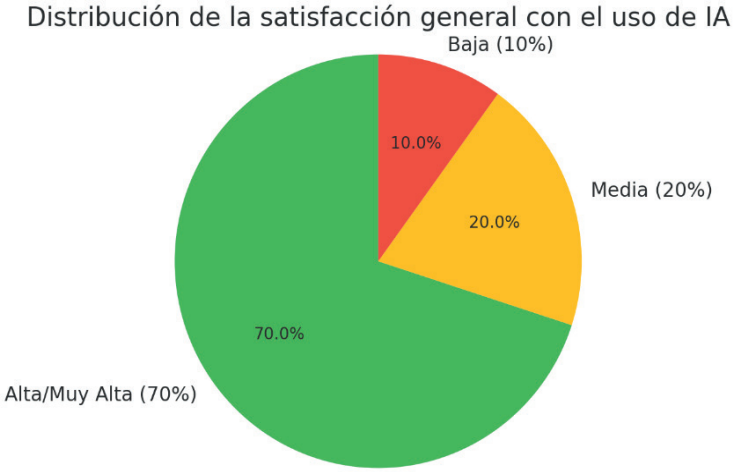
*4. Overall satisfaction with the use of AI*

Overall satisfaction averaged 4,25/5. Seventy percent of respondents expressed high or very high satisfaction,

while 20 % were moderately satisfied and 10 % expressed low levels of satisfaction.




**Note:** comparing the averages of teachers and administrators for each indicator (efficiency, adaptability, quality, and satisfaction).
**Figure 1.** Comparison of measures by indicator




**Note:** The pie chart shows the percentage distribution of overall satisfaction with the use of AI.
**Figure 2.** Overall distribution of AI use

**Interview results**

Qualitative analysis of semi-structured interviews with 21 academic managers and teachers revealed four main categories: impact on efficiency, improvement in adaptability, perception of quality, and implementation challenges.

*1. Impact on efficiency*

Interviewees agreed that the incorporation of artificial intelligence tools has significantly reduced the time spent on administrative tasks and project monitoring. One academic manager noted: "Now I can monitor progress and detect delays in real time, without relying on monthly reports" (E5). This perception was recurrent in 85 % of the interviews, highlighting time savings as the most tangible benefit.

*2. Improved adaptability*

Seventy-eight percent of respondents said that AI has made it easier to reschedule tasks and redistribute resources in the face of unforeseen events, thanks to features such as automatic alerts and data-driven recommendations. One teacher mentioned: "When a project is delayed, the system proposes adjustments and prioritizes tasks, something that previously required several meetings" (E12).

*3. Perception of quality in results*

72 % of participants indicated that AI has improved the quality of monitoring and the alignment of deliverables

with established objectives. The use of computer vision for the objective evaluation of presentations and documents was highlighted. One teacher commented: "The automatic feedback provided by the platform is more accurate than manual evaluations" (E8).

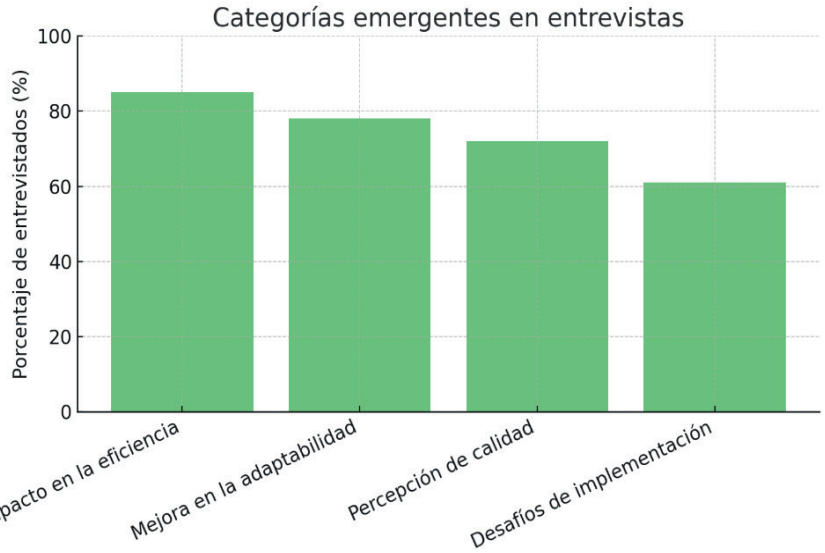
*4. Implementation challenges*

Despite positive perceptions, 61 % of respondents mentioned barriers such as the initial learning curve, resistance to change, and connectivity limitations at certain university campuses. One manager noted: "The potential is enormous, but without training and constant technical support, not everyone can take advantage of it" (E2).

**Table 1.** Emerging categories identified in the interviews

| Emerging category | Frequency (n=21) | Percentage |
|---|---|---|
| Impact on efficiency | 18 | 85,0 |
| Improvement in adaptability | 16 | 78,0 |
| Perception of quality | 15 | 72,0 |
| Implementation challenges | 13 | 61,0 |

**Note:** Frequency corresponds to the number of respondents who mentioned each category. A single participant could select more than one category.




**Note:** The bar chart shows that the highest percentage of mentions corresponded to the impact on efficiency (85 %), followed by improved adaptability (78 %), perceived quality (72 %), and finally implementation challenges (61 %).

**Figure 3.** Percentage of interviewees who mentioned each emerging category

**Comparative analysis of teachers vs. academic managers**

To identify significant differences in the perception of the implementation of artificial intelligence in academic project management, the means obtained in the four indicators evaluated (efficiency, adaptability, quality, and satisfaction) were compared between teachers (n=49) and academic managers (n=21) using Student's t-test for independent samples, after verifying the homogeneity of variances.

The results showed that the means for academic managers were consistently higher than those for teachers: efficiency (4,30 vs. 4,00), adaptability (4,35 vs. 4,10), quality (4,35 vs. 4,25), and satisfaction (4,30 vs. 4,20). However, only in the efficiency indicator did the difference reach statistical significance (t=3,112; p=0,002), showing that managers perceive a more marked improvement in time optimization and milestone control than teachers. In the other indicators, although the means were higher for managers, the differences were not statistically significant (p>0,05).[36,37]

**Triangulation of results**

The integration of quantitative and qualitative data revealed significant similarities. The survey showed that efficiency was the highest-rated indicator, a result that coincides with the category "impact on efficiency" that emerged from the interviews, mentioned by 85 % of participants. Similarly, adaptability scored an average of 4,2/5 in the questionnaire and was mentioned by 78 % of respondents in the interviews, with descriptions

highlighting AI's ability to reschedule tasks and redistribute resources.

In terms of quality, the average score of 4,3/5 in the survey was in line with 72 % of mentions in interviews about improved monitoring and accuracy of results. Finally, the "implementation challenges" identified in 61 % of the interviews provide context for the more moderate ratings on adaptability and overall satisfaction indicators, underscoring the influence of factors such as the learning curve and infrastructure limitations.[38,39]

**Additional findings**

During the qualitative analysis, two findings were identified that were not anticipated in the initial objectives:

1. Potential of AI for predictive analysis in strategic decision-making. Some managers mentioned that, beyond operational management, AI tools offer projections that could be used in medium- and long-term institutional planning.
2. Motivational effect on the work team. Both teachers and managers noted that the use of advanced technology has increased motivation and interest in training in new tools, generating an indirect positive effect on the institution's culture of innovation.

These findings suggest future lines of research that could delve deeper into the strategic and cultural impact of adopting artificial intelligence in academic settings.[40]

## DISCUSSION

The results show that efficiency is the indicator with the most positive perception, especially among academic managers, where a statistically significant difference was found compared to teachers (t=3,112; p=0,002). This finding coincides with that reported by Jones and Garcia [(3)], who demonstrated that the use of machine learning algorithms optimizes resource allocation and improves execution times. Similarly, Perez et al.[4] found that AI platforms for academic milestone management allow for more agile monitoring and reduce delays in project execution.

In relation to adaptability, the high averages obtained in the survey (4,2/5) and 78 % of mentions in interviews support the findings of Wu and Lee[5], who documented that intelligent chatbots and AI systems with automatic alerts facilitate the reorganization of tasks and the reallocation of resources in the face of unforeseen events. In addition, Vargas and Li[6] complement this view by pointing out that the incorporation of real-time analysis increases the responsiveness of educational institutions to changes in the environment.

The perception of quality was also favorable (average 4,3/5), in line with the literature that highlights AI as a resource for increasing the accuracy of evaluations and the alignment of results with objectives.[6,10] Pawson and Tilley[10] assert that evidence-based systems allow for more objective evaluation, while Hernández[7] warns that these benefits may be affected if transparency and the reduction of algorithmic bias are not guaranteed.

In terms of implementation challenges, the qualitative results show that 61 % of respondents identified barriers such as resistance to change and the need for training. These findings coincide with those described by Ramírez and Soto[8], who point out that the adoption of AI requires investment in infrastructure and continuous training, and with the socio-technical perspective of Trist and Bamforth[11], which emphasizes the importance of organizational adaptation for effective implementation.

Finally, additional findings revealed that AI not only impacts operational management, but also has strategic potential for institutional planning and a positive effect on staff motivation. This point has not been extensively developed in the reviewed literature, although Creswell and Plano Clark[40] argue that mixed-method research can uncover unforeseen dimensions, opening up new lines of research on the transformative role of AI in institutional culture.

## CONCLUSIONS

The integration of artificial intelligence tools in academic project management had a positive impact on efficiency, adaptability, and quality indicators, with efficiency being the most highly valued aspect and showing a statistically significant difference between academic managers and teachers.

The adaptability of processes was strengthened thanks to features such as automatic task rescheduling and intelligent resource redistribution, which allowed for a faster response to unforeseen events, in line with previous findings in the literature.

The perception of improved quality of results is linked to AI's ability to perform more accurate monitoring and objective evaluations, although risks associated with algorithmic bias have been identified and must be controlled.

Implementation challenges—such as resistance to change, the need for training, and infrastructure limitations—confirm that AI adoption depends not only on technology, but also on organizational and cultural readiness for its use.

Additional findings indicate that AI can play a strategic role in institutional planning and have a motivating

effect on academic staff, opening up new opportunities for research on its impact on organizational culture.

## RECOMMENDATIONS

Strengthen the training of teachers and academic managers in the use of AI tools, with an emphasis on data interpretation and practical application in project management.

Implement ethical control and algorithmic audit policies to prevent bias and ensure transparency in evaluation and decision-making processes.

Optimize the technological infrastructure of institutions to ensure accessibility and smooth operation of AI platforms, especially in environments with connectivity limitations.

Promote the progressive integration of AI, starting with pilot projects that allow its impact to be evaluated before large-scale implementation.

Explore new lines of research related to the use of AI in institutional strategic planning and its influence on the motivation and professional development of academic staff.

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## FUNDING

The authors did not receive funding for the development of this research.

## CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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