Revista Digital de Investigación y Postgrado
ISSN: 2665-038X
ISSN-L: 2665-038X
omar.escalona@iesip.edu.ve
Instituto de Estudios Superiores de Investigación Y Postgrado
República Bolivariana de Venezuela

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Revista Digital de Investigación y Postgrado, vol. 6, no. 12, 2025, July-December, pp. 153-166
Instituto de Estudios Superiores de Investigación Y Postgrado
San Cristóbal, República Bolivariana de Venezuela

DOI: https://doi.org/10.59654/5b86nv09

Available in: https://www.redalyc.org/articulo.oa?id=748582382010

Implementation of artificial intelligence: A strategy for learning planning and evaluation

Implementación de la Inteligencia Artificial: Una estrategia para la Planificación y Evaluación del Aprendizaje

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Received: may / 6 / 2025 **Accepted:** may / 25 / 2025

How to cite: Mejía, R. S. A. (2025). Implementation of artificial intelligence: A strategy for learning planning and evaluation. *Revista Digital de Investigación y Postgrado*, 6(12), 143-154. https://doi.org/10.59654/5b86nv09

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Abstract

This research is relevant because it analyzes how university professors in Nicaragua use emerging technologies in learning planning and assessment. This study sought to identify the degree of AI use by faculty, as well as the most commonly used tools. A descriptive qualitative approach was used, utilizing surveys and interviews with a sample of 30 higher education professors. The data were processed through statistical analysis and thematic categorization.The results revealed that 62.5% of professors have basic knowledge of AI, and a similar percentage already use it in planning and assessment. ChatGPT was the most commonly used tool. Benefits were identified such as time savings, improved educational quality, and personalized learning. It is recommended to implement B-learning training courses to ensure broader and more responsible adoption of AI in higher education.

Keywords: B-learning, Learning evaluation, Artificial intelligence, Educational planning, Emerging technologies.

Resumen

Esta investigación es relevante por analizar cómo docentes universitarios en Nicaragua utilizan tecnologías emergentes, en la planificación y la evaluación del aprendizaje. El presente estudio buscaba identificar el grado de uso de la IA por parte del profesorado, así como las herramientas más empleadas. Se utilizó un enfoque cualitativo de tipo descriptivo, utilizando encuestas y entrevistas a una muestra de 30 docentes de educación superior. Los datos fueron procesados mediante análisis estadístico y categorización temática. Los resultados revelaron que el 62.5 % de los docentes posee conocimientos básicos sobre IA, y un porcentaje similar ya la utiliza en la planificación y evaluación. *ChatGPT* fue la herramienta más empleada. Se identificaron beneficios como ahorro de tiempo, mejora en la calidad educativa y personalización del aprendizaje. Se recomienda implementar cursos de formación en modalidad *B-learning*, para garantizar una adopción más amplia y responsable de la IA en la educación superior.

Palabras clave: *B-learning*, Evaluación de aprendizajes, Inteligencia artificial, Planificación educativa, Tecnologías emergentes.

Introduction

In the realm of university education, the adoption of technological tools, particularly artificial intelligence (AI), has become a growing trend that promises to revolutionize teaching practices. However, it is essential to investigate how teachers are integrating AI into their learning planning and assessment processes. This involves examining the degree of knowledge, appropriation, and use of these technologies, as well as the concrete strategies they employ to design didactic activities, personalize teaching, and evaluate student progress.

AI can be defined as 'the study of agents that receive perceptions from the environment and carry out actions to achieve objectives' (Poole et al., 2022, p. 3). In other words, AI seeks to create programs and machines capable of exhibiting seemingly intelligent behavior similar to humans (Rubio et al., 2021).

This research aligns with Sustainable Development Goal (SDG) 4, which seeks to ensure inclusive, equitable, and quality education, as well as promote lifelong learning opportunities for all. It focuses on the use of artificial intelligence to improve educational quality in universities. Additionally, it relates to national policies and programs in Nicaragua, such as the National Human Development Plan (PNDH), which prioritizes the modernization and transformation of the education system through the incorporation of innovative technologies to strengthen both the quality and accessibility of education.

Thus, the use of technology has evolved over the years, leading to the development of AI, understood as the ability of machines to handle and adapt to emerging situations, solve problems, answer questions, design plans, and perform various other functions that require a certain level of intelligence inherent to humans (Rouhiainen, 2018). Other researchers define it as the study of intelligent behavior in humans, animals, and machines that strives to convert such behavior into an artifact, such as computers and computer-related technologies (Ponce et al., 2014). Based on these definitions, AI represents the result of technological innovations that enable computers to perform human-like functions. In education, AI has been integrated as a key tool to optimize learning planning and assessment by facilitating more efficient and personalized processes.

At the international level, AI provides the necessary potential to address some of the greatest challenges in education today. In this context, both public and private universities have promoted various short courses on the use of emerging technologies like AI, but significant gaps remain among teachers regarding how it can be incorporated into learning planning and assessment.

This research is of great importance, as it will analyze how higher education teachers are using emerging technologies, such as artificial intelligence, for the process of planning and evaluating learning.

In this scenario, educators face the need to adapt their pedagogical approaches to new digital tools, which involves a process of training and adjustment in their methodologies. Despite the potential benefits of AI, such as personalized learning and the optimization of educational management, its effective integration into the planning and evaluation of the educational process depends on responsible and ethical implementation in particular.

All of the above is supported by Unesco, as AI can profoundly transform the education sector—from management to teaching methodologies—provided it is used responsibly and ethically. This is because AI is not just a tool but a comprehensive ally in the teaching-learning

process, promoting digital competencies.

The context of this study is a moment when university teachers in Nicaragua, like many other countries, are adapting to the use of AI. This process reflects significant changes driven by the rapid development of digital tools that are transforming the way we teach. The integration of artificial intelligence in university settings presents both a challenge and an opportunity for innovation in research planning and evaluation, promoting more effective and personalized education tailored to the needs of the 21st century.

It is crucial to understand how teachers are adapting their pedagogical approaches to planning and assessment by using AI in an ethical and effective manner, which has a direct impact on educational quality.

The objective of this study is to conduct an analysis of the integration of new technologies, such as AI, as a tool in the curriculum and assessment process used by Nicaraguan university teachers. This study explores how teachers use artificial intelligence in their pedagogical practice, analyzing its impact on improving teaching and designing more effective assessments within a university environment.

Thus, the incorporation of AI in planning and assessment processes by teachers will significantly improve the teaching-learning process and its evaluation. However, this will only be achieved if each teacher implements all designed activities ethically and responsibly, using existing technologies to be implemented in the classroom, in order to achieve meaningful learning for each student.

At the international level, in 2024, Patricio Bustamante, Expert in *Inteligencia Artificial en Evaluación Educativa: Cómo está transformando el aprendizaje* (Implementation of online course sales platforms and development of solutions based on automation and artificial intelligence), in his paper "Artificial Intelligence in Educational Assessment: How It Is Transforming Learning", states that: The integration of artificial intelligence in education is reshaping traditional teaching and assessment paradigms, paving the way for learning methodologies tailored to each student's unique capabilities and pace. It is evident that the arrival of AI in the educational field is not simply a technological trend, but a genuine transformation that touches the foundations of the traditional educational system, promoting efficiency and fairness in tests and examinations.

In 2023, Rómulo Hernán Banegas Ullauri, in his article *Optimización de la inteligencia artificial en la educación a través de estrategias docentes eficaces* (Optimization of Artificial Intelligence in Education Through Effective Teaching Strategies), states that effective teaching strategies supported by artificial intelligence, such as learning personalization and the use of intelligent tutoring systems, demonstrated improvements in academic performance and student motivation. The use of AI in educational environments showed a positive impact on student learning. Students who participated in AI-supported environments evidenced greater engagement

and better performance compared to those in traditional environments.

At the national level, studies on this subject are scarce. Among them, the research by Sambola (2023), Ordoñez and Sambola (2023), Romero (2022), and Fletes (2021) stands out, all of which agree that this is a complex issue in the educational field, posing a challenge for authorities, teachers, and students regarding the ethical and responsible use of AI.

AI promises to improve the quality of education across all areas and levels by making learning more personalized, adapting to the varied needs of students (Ocaña et al., 2019). To achieve this, it is necessary to strike a balance between daily activities, interaction with others, and the application of digital tools, while understanding each individual's differences and limitations.

Likewise, teachers use innovative tools in their professional lives, and we can say that experience highlights the importance of using methods and techniques that align with the technological era. Vera (2023) concludes that teachers value the efficiency, personalization, and feedback achieved through AI; however, the importance of responsible use is emphasized to ensure quality education.

This research was conducted to investigate how higher education teachers are integrating artificial intelligence into their learning planning and assessment. Once all aspects related to its use are examined, the goal is to create plans that strengthen the use of AI in teachers' teaching methods.

Methodology

This research employed a qualitative approach with a descriptive nature, aimed at understanding how university professors in Nicaragua utilize AI for learning planning and assessment processes.

Information was collected through semi-structured interviews and surveys administered to university professors from various disciplines. The objective of this research was to investigate how professors are using AI for planning and assessing their students' learning within the educational environment. Examples of pedagogical practices where efforts have been made to employ AI-based tools were also gathered.

"In descriptive studies, the researcher must be able to define, or at least visualize, what will be measured (concepts, variables, components, among others) and about what or whom data will be collected (people, groups, communities, objects, events, etc.)" (Nieto, 2018, p. 2).

This study was conducted as follows: First, a survey was administered using the Google Forms platform. The survey consisted of a total of 6 closed-ended questions that inquired about: Their general knowledge of AI. How they were applying it in the classroom. Which applications they had used. Whether they possessed technological tools at home to implement it. A general question: How frequently did they use AI? The activities they most commonly performed with the applications. Additionally, it included 3 open-ended questions where teachers could express

in their own words: The key benefits of using AI for planning and assessing learning. How they use these tools in the classroom. The results they were obtaining.

After validating the survey and interview, we proceeded to select a population of 70 university-level professors. From this population, a sample of 30 professors was selected. As defined by Mata et al. (1997, p. 19), sampling is the method used to select sample components from the total population: 'It consists of a set of rules, procedures and criteria through which a group of elements is chosen from a population to represent what occurs in the entire population. The selection criteria included all professors who voluntarily participated in the survey, which was shared through WhatsApp groups as well as personally.

Finally, the analysis was conducted using descriptive statistics. Through this method, response frequencies were calculated based on the answers provided by the professors. The quantitative data were processed using Microsoft Office Excel to obtain percentage analyses, tables, and graphs.

For the qualitative analysis, responses were grouped into thematic categories according to the informants' answers. The quantitative analysis helped summarize the interview responses from the professors. This process facilitated the identification of patterns and trends, highlighting key uses of AI in educational planning and assessment.

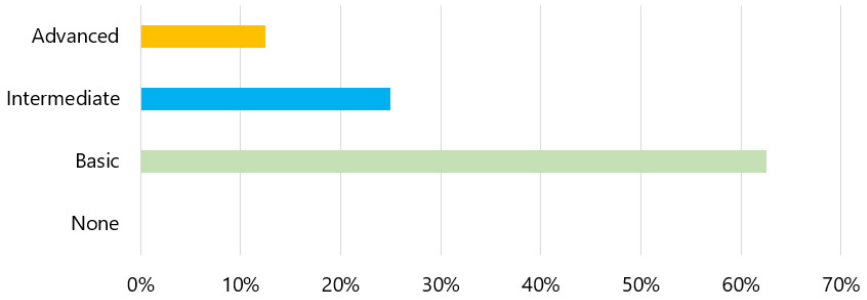
Once the data were processed, conclusions and recommendations were drawn regarding university professors' knowledge and application of AI in learning planning and assessment.

Results

The analysis of results obtained from the administered survey allows identification of university professors' level of knowledge about AI - a fundamental aspect for understanding their degree of preparedness to face current technological challenges in higher education.

Graph1

Level of knowledge about artificial intelligence among professors

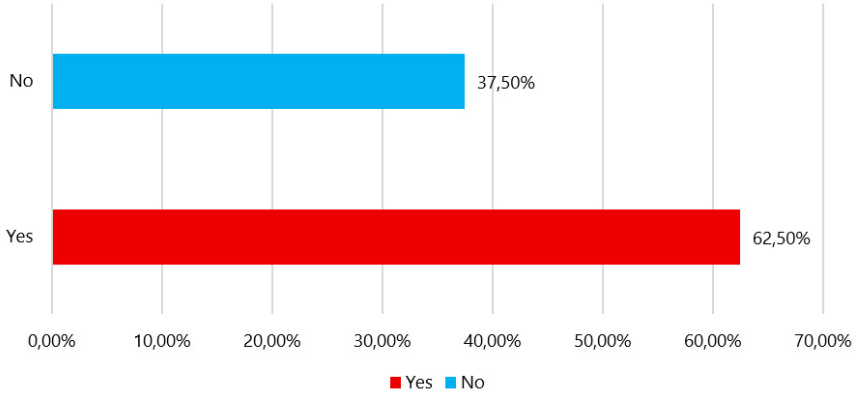


Note: Mejía (2024).

Graph 1 shows the percentage distribution of AI knowledge levels among respondents, revealing clear trends: 62.5% fall into the basic level, indicating limited familiarity with the subject. 25% reach an intermediate level, demonstrating greater understanding and use of AI. Only 12.5% possess advanced knowledge, reflecting deeper mastery of the technology. Notably, no participants reported lacking knowledge (0% in "None"), suggesting widespread interest in AI.

Graph 2

Teachers who have received training on artificial intelligence applied to education

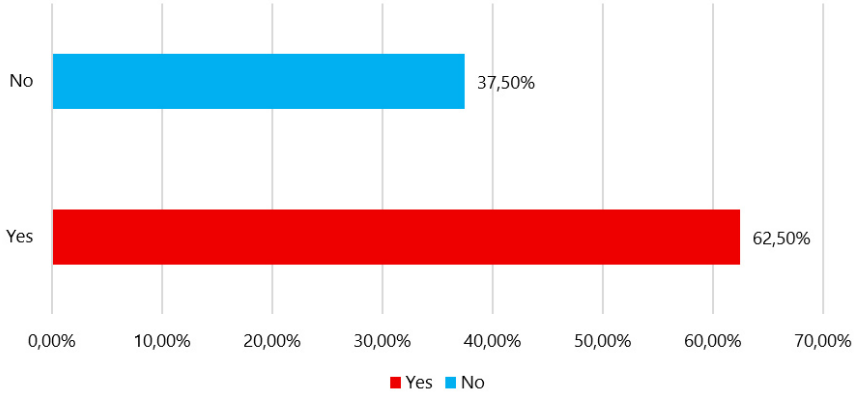


Note: Mejía (2024).

Graph 2 displays the percentage of faculty training received. The data reveals that: 62.5% of teachers have received AI tool training. 37.5% have not received training. These results are encouraging as a significant proportion of faculty have been trained. However, there remains a need to further promote training programs on AI applications for learning planning and assessment.

Graph 3

Use of AI tools for learning planning and assessment in educational settings

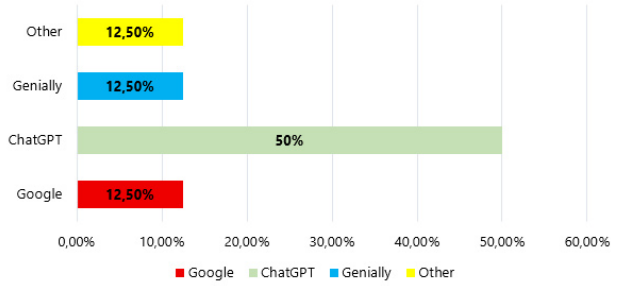


Note: Mejía (2025).

Graph 3 demonstrates the use of AI tools among higher education faculty, showing that: 62.5% employ these tools for planning and assessing student learning. 37.5% do not currently utilize them. This indicates a relatively high adoption rate of AI technologies in education. The data suggests that many educators recognize AI's value for: Optimizing pedagogical processes, enabling personalization, facilitating more efficient assessment and supporting precise planning. While most faculty have incorporated AI tools into their teaching practice, a significant portion (37.5%) remains non-adoptive. This underscores the need for continued promotion of AI integration and comprehension in educational settings.

Graph 4

AI tools used for learning planning and assessment



Note: Mejía (2025).

Graph 4 displays the AI tools employed by higher education faculty for learning planning and assessment. The data reveals: 57% of faculty choose to use ChatGPT, indicating strong preference for this particular tool. This reflects educators' trust in ChatGPT's effectiveness for: Content development, doubt resolution and learning personalization.

A significant proportion of faculty also utilize other tools like Google and Genially to complement their teaching practice. These tools are valued for enabling: Creation of interactive didactic materials and continuous assessment capabilities.

Table 1

Summary of the advantages of using ai in learning planning and assessment by educators

They are very helpful because they manage to generate learning alternatives.
They can serve as a guide for the application of strategies and methodologies.
Allows better planning and assessment of knowledge acquired by students.
They minimize time in some planning processes.
Better planning and evaluation of learning.
More didactic activities, exercises, and varied ones can be offered.

Note: Mejía (2025).

Table 1 presents a summary of the main advantages of using AI as reported by higher education faculty participants in the interview. The respondents indicate that artificial intelligence tools are useful for: Learning planning and assessment, generating learning alternatives, time optimization and improving learning process quality. A key benefit is the reduction in planning and assessment time, enabling faculty to focus more on: direct student interaction and implementing effective teaching strategies.

Discussion

With the development of AI, it is necessary to structure a teacher training program that fosters critical thinking, enabling students to understand world events and avoid thoughtless approaches that rely on resources limiting reason; as explained by (Chomsky, 2001). In this context, while 62% of teachers have received AI tool training - representing significant progress - 38% remain untrained. This gap highlights the urgent need to expand and intensify training programs to promote more conscious, widespread, and effective use of AI in education.

According to Barrios et al. (2021), teachers can design assessments that promote critical and creative thinking, skills that cannot be easily replicated by AI tools. However, despite this potential, the levels of AI knowledge among faculty remain limited: 62.5% of surveyed teachers report having a basic level, while only 12.5% possess advanced knowledge. This situation highlights the urgent need to strengthen teacher training in AI use, in order to expand their understanding and effective utilization in the educational context.

On the other hand, the use of AI models has had a significant impact on education, including improvements in efficiency, personalized and global learning, administrative enhancements, and the generation of intelligent content (virtual reality, robotics, audiovisual files, or 3D technology) (Chen et al., 2020). In this context, it is observed that 62.5% of teachers already use artificial intelligence tools for planning and evaluating learning, which reflects a positive adoption level as it allows them to dedicate more time to student consultations and knowledge reinforcement. However, 37.5% still do not incorporate these tools into their teaching practice, which underscores the need to promote their effective inclusion, particularly in key areas such as educational planning and assessment.

ChatGPT can assist educators in various tasks, including: Creation of educational materials, lesson planning, student assessment and design of didactic activities. These capabilities not only enable teachers to save time but also promote more personalized and student-centered learning (Vincent & van der Vlies, 2020; Martínez, Billelabeitia & Melero, 2023). Given this evidence, it's unsurprising that ChatGPT is the preferred tool among university faculty for learning planning and assessment, with a 57% adoption rate. Other tools like Google and Genially show only 14% preference, demonstrating ChatGPT's perceived utility in enhancing the educational process.

Ayuso and Gutiérrez (2022) argue that AI in education has the potential to adapt teaching met-

hods to students' individual needs, thereby enhancing learning effectiveness. Aligned with this perspective, educators highlight several perceived advantages of AI-based tools, including:Time optimization, improved quality in planning and assessment processes, and generation of more personalized learning alternatives. Furthermore, AI is particularly valued for its capacity to: Provide guidance on methodological strategies and offer diverse didactic activities. These features reinforce AI's utility in educational practice.

AI offers great potential to improve the efficiency and effectiveness of the teaching-learning process in education, by providing teachers with tools that will help them better plan and assess their students' knowledge.

The implementation of AI in educational assessment offers significant benefits for both students and teachers. Students benefit from instant and personalized feedback, as well as assessments adapted to their competency level. For their part, teachers benefit from reduced workload and access to valuable information for educational decision-making.

Conclusions

The results demonstrate that artificial intelligence (AI) represents a valuable resource for enhancing the efficiency and effectiveness of the teaching-learning process. Its implementation enables educators to: Optimize time management, iImprove the quality of lesson planning and assessment, design more personalized, student-centered learning experiences

Most teachers demonstrate greater familiarity with ChatGPT, which they use to develop lesson plans and student assessments.

Regarding other AI tools, teachers only have a basic understanding of their use.

A significant percentage of educators have received training on implementing AI for lesson planning and assessment, but 37.5% still require AI training.

Teachers highlight several advantages of using AI, such as: Time optimization, improved quality in planning and assessment, and the creation of alternative learning methods.

A general course on the use of artificial intelligence should be implemented, enabling teachers to familiarize themselves with and understand which tools to use for lesson planning and learning assessment, with the goal of achieving 100% AI-trained educators. This course should be delivered in blended learning (B-learning) mode, as this educational model combines face-to-face and virtual instruction, thereby enhancing participation among all teachers.

A balanced and critical approach to implementing AI in education is necessary to ensure that both educators and students understand the benefits and limitations of this technology and can use it effectively to enhance the teaching-learning process.

Therefore, the following recommendations are made for higher education institutions: Develop clear policies and strategies for the integration of AI in education, including the identification of clear objectives and the assessment of benefits and risks. Provide educators with the necessary training to use AI effectively and ethically in the classroom. Foster collaboration between educators and AI researchers to ensure: Technology alignment with educational system requirements and pedagogically sound implementation.

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