Chapter 10 / Capítulo 10

New literacies in the age of AI: Ethics, teaching, and writing (English Version)
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Process of integrating AI into research skills training in the Venezuelan university context

Proceso de integración de la IA en la formación de competencias para la investigación en el contexto universitario venezolano

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ABSTRACT

The research was conducted using a qualitative approach, with the purpose of understanding the stages of the AI integration process in research competency development within the Venezuelan university context. A hermeneutic phenomenological design was employed, allowing for the exploration of faculty perceptions regarding the challenges presented by AI. Eight (8) university faculty members from different areas of knowledge participated in the research. These faculty members had experience as teachers, tutors, and jury members, and held administrative positions in the university hierarchy (associate and full professor) at four Venezuelan universities: UPEL, UC, UNEFA, and UNELLEZ. Semi-structured interviews were used, which were processed until category saturation was reached, structured, and triangulated among key informants, authors, and researchers. The findings of this research reveal that the process of integrating AI into research skills development within the Venezuelan university context can be outlined in five stages experienced by the teacher: resistance to change, modification of limiting beliefs, teacher training in AI tools, transformation of classroom practice, and participation in the evaluation phase as a tutor and jury member. These stages correspond to a process that the teacher goes through, often without being aware of it.

Keywords: Research Skills; Artificial Intelligence; Training In Research Skills; Integration Process.

RESUMEN

La investigación se llevó a cabo con un enfoque cualitativo, con el propósito de comprender Cuáles son las etapas del proceso de integración de la IA en la formación de competencias para la investigación en el contexto universitario venezolano. Se empleó un diseño fenomenológico hermenéutico, que permitió explorar las percepciones de los docentes ante los desafíos que presenta la IA. En la investigación participaron ocho (8) docentes universitarios de diferentes áreas del conocimiento, con experiencia como docente, tutor, jurado y con categorías administrativas en el escalafón universitario de asociado y titular de cuatro universidades de Venezuela UPEL, UC, UNEFA, UNELLEZ. Se empleó la entrevista semiestructurada, la cual fue procesada hasta saturar las categorías, estructurar, triangular entre los informantes claves, autores e investigadoras. Los hallazgos de esta investigación revelan que el proceso de integración de la IA en la formación de competencias para la investigación en el contexto universitario venezolano se puede esquematizar en cinco etapas vividas por el docente: la resistencia al

cambio, modificación de las creencias limitantes, la formación docente en herramientas IA, la transformación de la práctica en el aula y la participación en la fase evaluativa como tutor y jurado. Estas etapas corresponden a un proceso que el docente va transitando sin que muchas veces sea consciente de ello.

Palabras clave: Competencias para la investigación; Inteligencia artificial; Formación en competencias investigativas; Proceso de integración.

INTRODUCTION

With the arrival of artificial intelligence (AI) in university research processes, a transformation has occurred in the role of the university teacher, leading to significant changes in the skills of both teachers and students. This process not only involves considering technical or methodological aspects; rather, it is complex and involves an emotional, cognitive, and epistemological journey. In this regard, Cárdenas (2023) proposes clear criteria for validating the use of AI, including the explicit declaration of the use of generative tools, the reconstruction of the analytical process, and the delimitation of the scope of AI, differentiating between technical assistance and epistemological decisions.

This leads to a rethinking of the role of the researcher and intellectual production methods. From an ontological perspective, university teachers face the challenge of redefining their role as researchers. As Corona (2025) mentions, AI "does not displace the teacher, but rather reinscribes them as an active epistemic agent" (p.111). This transformation requires deep reflection on professional identity, the ethics of technology use, and responsibility in the training of new researchers.

In this sense, the epistemological dimension of integrating artificial intelligence (AI) into university research must be approached from a critical, situated, and dynamic perspective that recognizes the complexity and probabilistic nature of the knowledge generated by automated systems. As Román (2024) reveals, the field of AI epistemology is complex and multifaceted. Pérez (2024) points out that AI represents a confluence between classical epistemology and current technological challenges.

Given this scenario, university professors are allowed to access new techniques, broaden their research approaches, foster innovation in the design and development of scientific projects, and optimize their research skills, as proposed by Aguirre et al. (2024), research skills enhanced by artificial intelligence include the ability to automate data management and analysis, optimize resources to achieve more efficient results, and improve information gathering and evidence presentation processes. It is here that university teachers face the challenge of redefining their role, not only as transmitters of information but also as guides in the development of research skills. This transformation requires a comprehensive review of traditional teacher functions, particularly regarding research training (Marcelo, 2009).

Research training in contexts where AI enables teachers to adopt new critical, reflective, and strategic positions, as Van Manen (2003) points out, the pedagogical act must recover its experiential and ethical dimensions, particularly when technologies mediate the relationship between the individual and knowledge. In this sense, teachers must play an active role in creating hybrid environments that integrate face-to-face and virtual experiences, the human and the algorithmic, without losing sight of the ethical and formative dimensions of their work (Coll, 2004).

In contexts where AI is present, competencies must be expanded to include understanding algorithms, analyzing data biases, and using digital tools to explore, contrast, and visualize information. That is why it is essential to develop research skills, which involve not only mastering techniques but also formulating relevant questions, selecting reliable sources, and critically constructing knowledge (Zabalza, 2007). For their part, Arzuaga et al. (2023) assert that research skills must be developed in a cross-cutting manner, integrating autonomous thinking, theoretical foundations, and territorial sensitivity.

In this vein, Cárdenas (op. cit.) asks: How should academia adapt to the rise of generative AI? This opens the door to a profound reflection on the research skills that should be promoted in students and supported by teachers. From an experiential perspective, the process of adaptation of university teachers to the use of generative AI, specifically in terms of the development of research skills, whether transversally in the different subjects or curricular units of an academic degree program, or in a research methodology course.

This is where the use of artificial intelligence in education raises ethical and epistemological dilemmas that we cannot ignore, as Bunge (2009) reminds us that all scientific practice must be guided by ethical principles that ensure the social responsibility of knowledge. In short, developing research skills with AI is not just about learning to use tools, but about transforming the way we understand knowledge, the subject being researched, and the environment in which it is produced.

University teachers are called upon to lead this transformation from a critical, ethical, and situated position, capable of integrating technology without losing sight of the humanity of the research process. This vision aligns with the principles of critical pedagogy, which sees education as an act of liberation and transformative consciousness, where Freire (1997) argues that teachers must promote educational practices that stimulate reflection, dialogue, and critical action. In the current context, this idea takes on special relevance, as AI can be used both to empower and to control.

That is why teachers have a responsibility to train students to question the assumptions behind data, interpret algorithmic discourses, and construct contextualized knowledge. As Giroux (2001) points out, critical teachers not only transmit knowledge but also create the conditions for students to become active protagonists in their own education.

This allows us to propose, as a central axis, the understanding of how AI modifies the ways of thinking, validating, and producing knowledge in the university environment, requiring teachers to reconfigure their ontological (as subjects who investigate) and epistemological (as mediators of knowledge) positions. In this sense, it is necessary to listen to the voices of teachers undergoing this transformation through the critical, reflective, and situated experience of their research practices. These findings are drawn from experiences with AI, seeking to understand how teachers can take on an active, ethical, and relevant role in building research skills in the age of artificial intelligence.

DEVELOPMENT

The research used a qualitative approach to examine the stages of integrating AI into the development of research skills in the Venezuelan university context. This approach helps us to capture the experiences, meanings, and challenges that arise in current educational practice.

The qualitative paradigm, according to Hernández et al. (2022), seeks to interpret complex

phenomena from the perspective of social actors, which is relevant for understanding the process that teachers are undergoing in relation to AI. A phenomenological-hermeneutic design was selected to explore teachers' perceptions of the challenges posed by AI and to understand the deeper meaning of human experiences, especially in times of professional transformation, as proposed by Van Manen (Op. cit.). Eight (8) university teachers from different areas of knowledge participated in the research, with experience as teachers, tutors, examiners, and in administrative positions in the university hierarchy as associates and tenured professors at four universities in Venezuela: Universidad Pedagógica Experimental Libertador (UPEL), Universidad de Carabobo (UC), National Experimental Polytechnic University of the National Armed Forces (UNEFA), and National Experimental University of the Western Plains "Ezequiel Zamora" (UNELLEZ).

For collecting information, the primary technique used was the semi-structured interview. Kvale and Brinkmann (2015) highlight that this type of interview provides access to participants' contextualized knowledge, especially in educational research. The interview script, as an instrument, was developed based on theoretical categories and preliminary findings to capture in-depth narratives.

The criterion of theoretical saturation, as suggested by Strauss and Corbin (2002), was applied to ensure that the emerging categories reflected the diversity of perspectives on the process by which teachers incorporate AI into their research practice. This allowed us to identify patterns in the discourse and contrast the experiences of teachers in different disciplinary areas, professional backgrounds, and levels of familiarity with AI tools.

Based on the teachers' interviews, the following categories emerged.

Change from a traditional role to an emerging role

According to key informants, it is necessary to redefine the traditional role of the teacher as a simple transmitter of information, limited to administering the contents of an academic program, redirecting it in the following dimensions:

Curator of knowledge

A professional who actively searches different sources of knowledge, filters, selects, and organizes information, giving meaning to the vast amount of information available through critical analysis. At the same time, they must become defenders of cognitive sovereignty, understood as the ability of a person, community, or nation to control and manage their own knowledge, thinking, and decisions (Ruocco, 2025), which, when developed, allows each person to develop their own information filtering systems and choose when to submit to that flow of information, being able to use the benefits of the current era to their advantage. Contributions such as that of Acevedo et al. (2025) reinforce the idea that teachers, by playing an active role in digital knowledge management, are guiding critical thinking in the face of artificial intelligence, as they must not fall into blind dependence on its results.

Strategic

They must be able to guide complex thought processes, model research practices that adapt to the context, and foster communities of practice that cross disciplines. In this sense, teachers become managers of educational processes that combine technology, ethics, and critical thinking, a vision shared by Román et al. (2024), who argue that an epistemological reconfiguration is needed, with artificial intelligence asking us to rethink how we think as educators because it is changing the way we teach.

Human

As mediators in the management of these technologies and preservers of the knowledge that makes us human and constantly evolving beings, teachers are willing to create research experiences that make the most of AI's potential, without losing sight of the researcher as the center of the process. From a humanistic perspective, Santos (2001) describes the teacher as a builder of meaning and a craftsman of the soul, capable of connecting culture with life, preserving the knowledge that forms human identity. Likewise, Meirieu (2007) states that teachers must act as ethical bridges between knowledge and students, committing themselves and ensuring that technology does not replace the pedagogical relationship.

Ethical

Teachers become ethical and critical mediators between students and emerging technologies, enabling them to take a position on a situation and argue their case. Their guidance directs the use of AI in the creation of knowledge, thus avoiding the reproduction of inequalities or the manipulation of results. Without ethical guidance, artificial intelligence can perpetuate biases and errors (Camacho et al., 2025). Therefore, teachers must adopt a reflective, formative stance to ensure the responsible use of these technologies.

The contributions of key informants allow us to link this category to the first two stages of the AI integration process for teachers: resistance to change and modification of limiting beliefs. In the case of the former, it may arise when faced with the possibility of taking on the emerging role, when teachers do not want to leave their comfort zone, or in other cases, when they have difficulty accessing technological resources, including up-to-date hardware and a stable and fast internet connection, which is particularly prevalent in countries or regions with more vulnerable socioeconomic and technological situations, widening the gap between regions in terms of knowledge generation.

According to the informants, teachers need to recognize limiting beliefs, such as: AI encourages laziness, AI will replace teachers, or books are no longer necessary. Another dilemma that teachers may experience at this stage is: Who am I evaluating? This question will become clearer once teachers begin training in the educational use of AI. Once these beliefs are recognized, acknowledge that they are not helpful if you want to move forward with this historic challenge in education, and through neuroplasticity, change them. In agreement with Doidge (2007), he argues that the human brain has an incredible ability to change and adapt, a phenomenon known as neuroplasticity. This ability allows us to modify our patterns of thought and behavior through new learning experiences. This ability is essential for teacher to redefine their role, reevaluate their beliefs, and train themselves in the didactic use of AI from an ethical, reflective, and contextualized perspective.

Implications of the emerging role that teachers must fulfill in an AI-mediated context

Key informants agree that one of the most significant challenges is the need for continuous updating in different areas, on the one hand, for the management of technical tools, as it is undeniable that advanced digital literacy is crucial, not only for managing tools, but also for understanding algorithms, their limitations, biases, and structures. Teachers can appropriate these tools by being active researchers who practice AI for knowledge generation and participate in research groups. In this way, they can develop the ability to build collaborative networks, both inside and outside the university, that allow for the sharing of best practices, joint reflection, and the consolidation of an inclusive and relevant research culture. This would constitute the third stage of the integration process, in which teachers have already overcome their resistance to change and transformed their limiting beliefs, have trained themselves at the epistemological

and methodological levels, and are beginning to apply AI in their own research.

In this context, González et al. (2022) emphasize that the research culture of teachers in Latin America is strengthened when participation in digital academic communities is encouraged, emerging technologies are used in a contextualized manner, and a connection is established between local and global knowledge. In this way, teachers not only receive training in the technical use of AI but also incorporate it as a tool to enrich their educational, critical, and transformative roles. However, the informants also highlight the need for training in philosophical and pedagogical frameworks that enable them to redefine their roles within a hybrid knowledge ecosystem that combines face-to-face and virtual activities, unified in the pursuit of knowledge construction. This requires a change in the roles of teachers and students, establishing guidelines for mediation through technology and emphasizing the development of critical thinking (Díaz & Benitez, 2025). In this sense, epistemological thinking becomes fundamental: researchers need to question the assumptions behind the data generated by AI.

Transformation of classroom practice

The findings show that once teachers have overcome their resistance to change and modified their limiting beliefs, they begin to actively shape and practice research in partnership with AI so that, with their knowledge and experience, they can accompany students in the optimal learning of AI for research, which will occur in stage four of the integration process. Especially in hybrid ecosystems, where face-to-face and virtual activities are combined, one question teachers may ask themselves is: What types of activities can be used to promote the appropriate use of AI in university education? For students to appropriately use tools to integrate AI, the teacher who accompanies them must have done so beforehand, enabling them to design activities that develop the skills students require.

In line with the above, key informants believe that teaching practices need to be reformed from planning to the development of knowledge management strategies, with support from an AI application that can manage content, videos, images, and other actions, serving as a starting point for generating critical thinking. This finding coincides with Molina et al. (2025), who argue that teaching practices need to be rethought, from planning to knowledge management, incorporating AI applications that act as a starting point for fostering critical thinking. Making students reflect that if they only think about requesting information from AI and cutting and pasting it, its application makes no sense. However, it is valued as a generator of new ideas, a corrective assistant, and support for textual production through face-to-face human review. In that case, the dimension shifts from searching for information to evaluating content and selecting it based on its relevance by a human.

Teaching practices focused on a logic of co-construction of knowledge require teachers to act as facilitators of environments for exploration and analysis, rather than simply giving direct instructions. This involves redesigning learning environments so that students can develop research skills to interpret, contrast, and reconfigure knowledge based on the information these tools generate, promote metacognition, integrate active methodologies such as project-based learning, and foster an ethic that enables them to discern the responsible use of AI.

This new paradigm involves flexible, adaptive educational practices focused on developing skills to formulate relevant questions, choose reliable sources, and construct solid arguments, connecting theory and practice, thus transforming the classroom into a laboratory of thought, where AI enhances, but does not replace, the human capacity for purposeful inquiry. Santana (2025) argues that it is fundamental to train teachers oriented towards artificial intelligence with

a critical and reflective attitude, so that they can integrate these technologies without losing sight of the ethical, pedagogical, and humanistic principles that underpin educational practice. Another fundamental aspect is to emphasize the formulation of relevant, contextualized, and ethically sound research problems, while relying on AI to explore trends, generate hypotheses, or visualize data, yet remaining aware that the criteria for constructing research remain human.

The evaluation phase in AI: participation as a tutor and evaluation panel

Ideally, reaching this stage requires having completed the previous ones, although it is known that some teachers evaluate without having taught research or without being active researchers. In everyday practice, a teacher who knows their students can recognize how they express themselves, both in colloquial and technical language, and therefore will easily be able to differentiate a text produced by a simple AI search.

Traditionally, one of the main difficulties' students faced in conducting their research was writing their ideas coherently. Language is considered the instrument through which researchers express knowledge as they have apprehended it through their life experiences: knowledge, experiences, perceptions, and other subjective elements that leave the researcher's personal mark on the product they deliver (Marín, 2019). When AI is used, a text may contain unfamiliar terms to the researcher. This is where they must delve deeper, conducting new searches to clarify these concepts and make the writing more understandable for all readers to whom the research may be addressed, whether from a technical point of view or at an academic level. This educational approach strengthens research autonomy and ethical discernment in the use of emerging technologies (Camacho et al., Op. cit.).

This is where the challenge lies in teaching them to broaden the research process by reading the direct sources (books, scientific articles, blogs, among others) that appear in the AI search, rather than directly penalizing them with a grade. At first, the evaluating teacher must encourage the continuity of the process, inviting the student to complement their product with critical analysis that allows them to reconstruct the text and, above all, to demonstrate a deep understanding of the text they are presenting as their own work.

CONCLUSIONS

The findings of this research reveal that the process of integrating AI into the development of research skills in the Venezuelan university context can be outlined in five stages experienced by the teacher, which are often passed through without the teacher being aware of it, some more easily and quickly than others.

The first stage is resistance to change, a defensive reaction to the unknown. Many teachers feel anxiety, mistrust, and a loss of control over teaching processes when faced with technologies that transform their traditional practices. This resistance should not be seen as denial, but rather as an adaptive response to the dissonance between their previous pedagogical frameworks and new ways of generating knowledge, as well as a lack of training in AI and institutional policies (López et al., 2025).

For Sánchez et al. (2025), resistance to change often stems from limiting beliefs about the supposed dehumanization of knowledge or from fear of losing control over academic processes. In this sense, the second stage involves addressing limiting beliefs; once the initial resistance is overcome, teachers begin to question their beliefs about research and technology. According to Torres and Arroyo (2025), this involves recognizing the educational potential of AI, opening up to new forms of tutoring and assessment, and redefining the role of teachers as critical

mediators. It is essential to address these beliefs from a formative perspective, recognizing artificial intelligence (AI) as a support tool rather than a replacement for critical thinking or ethical judgment. Changing these limiting beliefs requires creating spaces for teacher reflection in which the role of AI in knowledge production is discussed, its biases examined, and an attitude of informed openness fostered.

The third stage is teacher training in AI tools. Cárdenas (op. cit.) states that to get the most out of AI in university research, it is essential to train teachers to use tools that facilitate the research process, such as writing assistants, source verifiers, and simulators. This phase focuses on acquiring both technical and methodological skills, always within an ethical and contextualized framework. In addition, this phase requires teachers to stay up to date with technological advances, develop advanced digital literacy, manage collaborative environments, and critically evaluate the results produced by AI, all of which are key to ensuring academic quality. Training programs for teachers have been launched that include simulators, writing assistants, source verifiers, and collaborative environments (Oseda et al., 2025).

The fourth stage, the transformation of the classroom process, whether face-to-face or virtual, is in full swing and goes beyond the technical because it is deeply pedagogical. It involves a new way of understanding teaching as a dialogical, ethical, and contextual process. Loayza (2023) points out that to achieve this transformation, it is essential to break down the technological, organizational, and attitudinal barriers that hinder the effective integration of AI in the classroom. Teachers are reinventing their teaching strategies by incorporating tools such as AI-generated mind maps, automated rubrics, interview simulations, and case studies. Pedagogical innovation projects have been launched that use AI to personalize learning and encourage student self-regulation (Kroff & Ferrada, 2024).

In addition, AI facilitates adapting content to different learning styles, generates personalized feedback, and stimulates active student participation. In this new stage, teachers are consolidating their role as designers of educational experiences that integrate technology, ethics, and context.

Finally, the fifth stage focuses on the teacher's role as a tutor and evaluator of AI-based research projects. At this point, teachers must ensure the traceability of the research process, the originality of the products, and the theoretical basis behind each methodological decision. Cárdenas (Op. cit..) suggests clear criteria for validating the use of AI in theses, including an explicit declaration of the use of generative tools, the reconstruction of the analytical process, and the integration of authentic scientific literature. From an ethical perspective, this stage requires skills such as mediation, active listening, and critical and ethical evaluation, recognizing the student as an epistemic subject in dialogue with technology. In the era of generative AI, university teachers not only teach but also accompany, transform, and ensure the ethics of knowledge. It is essential to prepare teachers to integrate philosophical and pedagogical frameworks that transform their roles in hybrid learning environments, where artificial intelligence and face-to-face teaching combine to enrich the educational process. (UNAH, 2025)

Inga and Castro (2024) suggest that support should focus on fostering research autonomy, ensuring methodological transparency, and integrating authentic scientific literature. In this context, teachers become guarantors of academic quality in environments where AI plays an important role. Ultimately, this stage reinforces the transformation of the teacher›s role as an epistemic agent, where ethical support not only endorses the use of AI but also promotes a

research culture grounded in responsibility, creativity, and a commitment to knowledge. Atencio (2023) points out that the use of AI in educational research must be guided by ethical principles that safeguard academic integrity and encourage critical thinking in students.

Although this process presents challenges, it also opens doors to new opportunities for pedagogical innovation, technological equity, and academic sustainability, considering the voices of the teachers who report on the following challenges brought about by the integration of AI in the training of researchers:

1. Addressing uncritical dependence, where students unquestioningly trust what AI produces without verifying sources or processes, through a transformation that is not only methodological but also ontological: teachers must create spaces for complex thinking where AI acts as an ally, not a substitute.
2. Teacher training and gaps in access and training, especially in Latin American contexts, where not all teachers are equipped to integrate these technologies critically. The challenge of constant information, constant updating, and the struggle against time and obsolescence, because every day new contributions, updates, and emerging, innovative tools are promoted that leave behind what is learned and require the development of new, dynamic, changing skills at an impressive pace. The challenge is to keep up to date.
3. We must also consider the ethical challenges that arise: from data manipulation to the perpetuation of biases, AI can intensify inequalities if its use is not regulated. The issue of authorship is also relevant, as artificial intelligence can blur the researcher's identity if clear criteria for its co-creation are not established.
4. Tension between the speed offered by AI and the depth required by rigorous research. Training researchers in this environment requires a pedagogy that values pause, discernment, and applied ethics.
5. Cultivating a broader scientific narrative, capable of communicating findings in multimodal formats that connect with current generations characterized by digital culture.

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