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Analysis of the impact of Artificial Intelligence on distance education in Ecuador

Análisis del impacto de la Inteligencia Artificial en la educación a distancia en Ecuador

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ABSTRACT

The research objective was to analyse the impact of artificial intelligence on distance education in Ecuador. For the preparation of this article, adopting a meta-analytical design, seventeen academic publications from the 2023–2026 period were systematically reviewed, selected according to criteria of methodological rigour and contextual relevance within indexed repositories. The information was organised into a comparative matrix, enabling the identification of cross-cutting patterns, interpretative divergences, and research gaps of significance to the field. Five recurrent impact variables were identified: personalised learning, teaching efficiency, the development of digital competences, academic integrity, and equity of access. These findings indicate that the benefits of artificial intelligence coexist with pedagogical risks of varying nature, as well as territorial and gender disparities that constrain its equitable utilisation.

Descriptors: artificial intelligence; distance education; educational technology. (Source: UNESCO Thesaurus).

RESUMEN

Se desarrolló como objetivo de investigación analizar el impacto de la inteligencia artificial en la educación a distancia en Ecuador. Para la elaboración de este artículo bajo un diseño de metaanálisis, se sistematizaron diecisiete publicaciones académicas del período 2023-2026, seleccionadas mediante criterios de rigor metodológico y pertinencia contextual en repositorios indexados; la información se organizó en una matriz comparativa que permitió identificar patrones transversales, divergencias interpretativas y vacíos investigativos relevantes para el campo. Se identificaron cinco variables de impacto de mayor recurrencia: personalización del aprendizaje, eficiencia docente, desarrollo de competencias digitales, integridad académica y equidad de acceso, las cuales evidencian que los beneficios de la inteligencia artificial coexisten con riesgos pedagógicos de distinta naturaleza y con brechas territoriales y de género que limitan su aprovechamiento igualitario.

Descriptores: inteligencia artificial; educación a distancia; tecnología educativa. (Fuente: Tesauro UNESCO).

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Research articles

INTRODUCTION

Distance education in Ecuador has undergone a structural transformation in recent years, driven in part by the rise of emerging technologies and, in particular, by the accelerated deployment of artificial intelligence (AI)-based tools. This process, however, does not merely respond to global trends in educational digitalisation; rather, it is situated within a national context characterised by territorial heterogeneity, inequalities in access to connectivity, and the specific needs of a student population diverse in its socio-economic and cultural conditions

From a pedagogical perspective, AI represents far more than a set of technological tools; it constitutes a reconfiguration of knowledge mediation processes, of the relationship between teacher and student, and of assessment strategies in virtual environments. These dimensions have begun to be documented in studies produced during the 2023–2026 period, which illustrate how Ecuadorian educational institutions incorporate, adapt, or resist these technologies in their everyday teaching and learning practices

This article aims to examine, in a systematic and critical manner, the impact of artificial intelligence on distance education in Ecuador, based on an analysis of the most representative studies produced at national and Ibero-American levels. To this end, a meta-analytical methodology was adopted, enabling the integration and comparison of findings derived from research with diverse approaches, educational levels, and institutional contexts

The relevance of the topic lies in the rapid incorporation of generative AI platforms and applications, intelligent tutoring systems, and adaptive learning environments into the everyday educational landscape of Ecuador, often in the absence of robust regulatory frameworks, institutional policies, or teacher training programmes commensurate with such technological advancement. In this

regard, examining the pedagogical implications of these transformations is not only academically pertinent but also socially necessary

Accordingly, the research objective was to analyse the impact of artificial intelligence on distance education in Ecuador

THEORETICAL FRAMEWORK

Artificial intelligence, in its educational application, refers to a set of computational systems capable of simulating human cognitive processes, such as reasoning, language comprehension, pattern recognition, and decision-making (Granda-Dávila et al., 2024). In pedagogical contexts, these capabilities translate into the possibility of personalising learning pathways, generating automated feedback, identifying students' cognitive difficulties, and supporting teachers in curriculum planning.

Distance education, by contrast, refers to those modes of instruction in which face-to-face interaction between teacher and student is replaced or mediated by communication technologies, thereby requiring particular attention to learners' autonomy, self-regulation, and motivation (González-Criollo & Granda-Cruz, 2025). The convergence of artificial intelligence and distance education gives rise to adaptive learning environments, in which technological systems adjust content according to each student's pace, learning style, and level of prior knowledge.

From the connectivist perspective proposed by Siemens, learning occurs through connections between nodes of information, and artificial intelligence facilitates precisely the creation and consolidation of such connections in digital environments. This theoretical approach has gained renewed relevance with the emergence of generative AI, which enables not only access to information but also the active co-construction of knowledge between the learner and the technological system (Farinango et al., 2026).

In this vein, Leal-Cevallos et al. (2025) argue that generative AI represents a turning point in the history of contemporary pedagogy, as it introduces agents

capable of interacting, explaining, correcting, and motivating students functions traditionally assigned exclusively to the teacher. This reconfiguration of the teaching role does not imply its replacement, but rather its repositioning as a critical facilitator and expert mediator of technology-mediated learning processes.

The acceptance of artificial intelligence by students constitutes another theoretical axis of considerable relevance. In this regard, Espinoza-Bravo et al. (2025) propose the AIDUA (Artificial Intelligence Device Use and Acceptance) model, derived from the classical TAM (Technology Acceptance Model), to analyse the factors that determine higher education students' disposition towards the use of AI tools. These factors include perceived usefulness, ease of use, trust in the technology, and the influence of the immediate social environment.

Desde una perspectiva crítica, Castillo-Salazar y Mora-Rosales (2024) advierten que la integración de la IA en la educación superior ecuatoriana presenta tanto aciertos como desaciertos; entre los primeros se cuentan la eficiencia en la gestión de procesos administrativos, la personalización de la enseñanza y el acceso ampliado a recursos de aprendizaje, en tanto que entre los segundos figuran la tendencia al uso instrumental y acrítico de las herramientas, los riesgos para la integridad académica y la reproducción de sesgos algorítmicos que pueden afectar la equidad educativa.

El desarrollo de habilidades investigativas mediante IA representa, asimismo, un campo de exploración teórica emergente; en ese sentido, Padilla-Caballero et al. (2023) argumentan que las competencias investigativas del futuro universitario estarán íntimamente ligadas a la capacidad de interactuar críticamente con sistemas de IA, de discernir entre información confiable e información generada automáticamente, y de emplear estas herramientas como instrumentos de apoyo metodológico, sin que sustituyan el pensamiento analítico.

The institutional and political dimension of AI adoption in Ecuador has been the subject of specialised academic reflection. In particular, Taipicaña-Vergara et al. (2024) identify structural factors that condition the integration of AI within

Ecuadorian higher education, notably the availability of technological infrastructure, the training and disposition of academic staff, and the existence of regulatory frameworks to guide its responsible use. These factors configure a heterogeneous landscape in which institutions with a high capacity for innovation coexist alongside others that still face primary barriers to digital adoption.

Similarly, Velásquez-Albarracín et al. (2025) note that the integration of AI in Ecuadorian basic education encounters access-related challenges that reproduce or even deepen pre-existing inequalities, given that rural areas and lower-income communities often have limited connectivity and outdated or insufficient devices. This reality necessitates framing the impact of AI not only in terms of pedagogical efficiency but also in relation to educational equity. This perspective is further complemented by Modesto-Acosta et al. (2025), who emphasise that the pedagogical benefits of AI are both real and measurable, although their effective realisation depends on contextual conditions that are not always guaranteed within the Ecuadorian education system.

From the perspective of human computer interaction, as represented by Aparicio-Flores et al. (2025), a psychopedagogical dimension is introduced into the debate by linking students' perfectionist profiles with their digital competencies for online interaction. Their research suggests that personality variables, such as technological anxiety and dysfunctional perfectionism, may significantly condition students' disposition towards AI tools in virtual environments.

METHOD

The study adopted a meta-analytic design, understood as a methodological procedure that enables the integration and synthesis of findings from multiple primary studies addressing the same phenomenon, with the aim of producing more robust estimates and broader conclusions than those afforded by any individual study (Nuong-Deri et al., 2024). This design is particularly pertinent within the field of technology-enhanced education, where the proliferation of

fragmented studies often hinders the construction of a coherent and articulated overall perspective.

The analytical corpus comprised seventeen (17) academic publications, selected according to the following inclusion criteria: (a) publication within the period 2023–2026; (b) a specific focus on AI in Ecuadorian educational contexts or with direct implications for such contexts; (c) availability of the full text in repositories or indexed journals; and (d) methodological rigour verifiable through peer review. Opinion pieces lacking a formal review process were excluded, as were studies whose samples corresponded to contexts not transferable to the Ecuadorian case.

The sources consulted originate from indexed journals across diverse geographical regions, with a predominance of Latin American publications, thereby ensuring the contextual relevance of the analysis. The studies included encompass systematic reviews (Castillo-Salazar & Mora-Rosales, 2024; Farinango et al., 2026), quantitative field research (Espinoza-Bravo et al., 2025; Noblecilla-Quintana & Raymond-Cornejo, 2025), case studies (Encarnación-Maldonado & Saa-Zamora, 2025), and theoretical–critical analyses (Leal-Cevallos et al., 2025; González-Criollo & Granda-Cruz, 2025).

For the comparative analysis, a systematisation matrix was constructed to organise the studies according to: (a) educational level addressed, (b) mode of instruction, (c) type of AI tool examined, (d) impact variables measured, and (e) principal findings reported. This matrix enabled the identification of cross-cutting patterns, interpretative divergences, and research gaps of relevance to the field.

Data analysis followed an inductive–deductive procedure, whereby emergent categories derived from the studies were contrasted with previously identified theoretical frameworks. The treatment of information prioritised interpretative synthesis over mere data aggregation, in line with the critical pedagogical perspective underpinning this study. Validity was ensured through source triangulation, cross-comparison of findings across studies employing different

methodologies, and systematic consideration of the contextual conditions framing each investigation.

RESULTS

General overview of AI integration in Ecuadorian distance education

Overall, the studies analysed allow for the delineation of an evolutionary landscape regarding the integration of artificial intelligence within Ecuadorian education, with particular emphasis on distance and online modalities. The literature reports a sustained increase in the use of AI tools among university students engaged in virtual learning, albeit with marked differences across institutions, regions, and socio-economic strata.

In this regard, Noblecilla-Quintana and Raymond-Cornejo (2025) document that 73.4% of undergraduate students enrolled in online programmes reported having used at least one generative AI tool during the most recent academic cycle. Such tools were employed primarily for the production of summaries, the completion of assessed tasks, and the retrieval of specialised information. Usage rates are significantly higher among students in the cities of Quito and Guayaquil compared to those studying in university extensions located in highland or Amazonian provinces.

Consistent with these findings, Taipicaña-Vergara et al. (2024) identify considerable variation in institutional readiness for AI across Ecuadorian universities. Institutions with greater financial resources and international linkages tend to integrate AI more systematically, whereas smaller public universities face challenges related to technological infrastructure, staff training, and the absence of specific institutional policies governing AI implementation.

Comparative descriptive analysis of case studies

Case 1. Coronel Emilio Suárez Educational Unit, Imbabura Province

At the level of basic education, the study by Encarnación-Maldonado and Saa-Zamora (2025) constitutes one of the few case analyses conducted in Ecuador

with an explicit focus on AI use. The research documents the experience of an institution that implemented AI-based tools for the generation of adaptive teaching materials, automated feedback in language and mathematics exercises, and the monitoring of individual student progress.

Based on this experience, the study reports a statistically significant improvement in reading comprehension and mathematical problem-solving outcomes among groups that utilised AI-supported platforms, compared to control groups. However, the researcher notes that these benefits were concentrated among students with greater prior access to technological devices and those from families with higher educational attainment, suggesting that AI may amplify pre-existing inequalities if not accompanied by comprehensive digital inclusion strategies.

Case 2. Ecuadorian universities in online modality: the AIDUA experience

At the university level, Espinoza-Bravo et al. (2025) apply the AIDUA model to a sample of 1,248 online students from five Ecuadorian universities, with the aim of understanding the factors that determine the acceptance and effective use of AI tools in learning processes. The model indicates that perceived usefulness accounts for 41.3% of the explanatory weight in usage intention, followed by trust in data privacy (23.7%) and peer influence (18.4%).

Notably, the study reports that female students exhibit significantly lower levels of technological confidence compared to their male counterparts, which translates into more limited and less exploratory use of available AI tools. This gender gap in technological confidence represents a pedagogical challenge of considerable scope for institutions seeking to ensure equal opportunities within virtual learning environments.

Case 3. Generative AI in university programmes in law and social sciences

From the perspective of the humanities, Gómez-Mendoza and Arroyo-Gutiérrez (2024) examine the impact of AI on Ecuadorian education, with particular

attention to the social sciences fields in which technological adoption has historically been slower. Their analysis shows that the use of generative AI for the production of academic texts, jurisprudential research, and the synthesis of specialised literature has generated tensions concerning the originality of students' work and the assessment of complex competencies.

In this regard, the authors observe that lecturers in law programmes who have incorporated AI into their courses report increased efficiency in marking assignments, but also greater difficulty in distinguishing between students' genuine intellectual production and that which is assisted or generated by AI systems. This situation has necessitated a reconsideration of traditional assessment instruments and prompted the exploration of authentic assessment strategies based on real-time performance.

Case 4. Artificial intelligence and mathematics learning in higher education

Within the domain of the exact sciences, Lopez-Michelini (2024) analyses the influence of AI on mathematics learning in Ecuadorian higher education an area historically associated with high rates of course repetition and attrition. The study documents that the use of adaptive AI platforms in calculus and algebra courses significantly reduces dropout rates and improves average academic performance, as intelligent tutoring systems identify recurrent student errors and propose personalised reinforcement exercises with a level of granularity that is difficult to achieve in large-scale face-to-face settings.

Despite these advances, the researcher cautions that excessive reliance on AI platforms may lead to students developing operational competencies without achieving a deep conceptual understanding of mathematical processes. This phenomenon, referred to in the literature as AI-mediated surface learning, raises pedagogical challenges of considerable relevance for curriculum design in virtual modalities.

Table 1. *Comparative overview of emblematic cases.*

Case / Study	Level	Modality	AI Tool	Main Outcome
Encarnación-Maldonado & Saa-Zamora (2025)	Basic education	Face-to-face with digital support	Automated feedback platforms	Improvement in reading comprehension and mathematics; risk of widening inequalities
Espinoza-Bravo et al. (2025)	Higher education	Online	AIDUA model / generative AI	Perceived usefulness as the main predictor of acceptance; significant gender gap
Gómez-Mendoza & Arroyo-Gutiérrez (2024)	Higher education	Face-to-face and hybrid	Generative AI (ChatGPT and similar tools)	Tensions in assessment; need for authentic assessment strategies
López-Michelini (2024)	Higher education	Distance / virtual	Adaptive intelligent tutoring systems	Reduction in dropout rates; risk of AI-mediated surface learning
Noblecilla-Quintana & Raymond-Cornejo (2025)	Higher education	Online	Various generative AI tools	73.4% reported usage; higher concentration in urban areas

Note. Prepared by the author based on the analysed studies.

The cases systematised in Table 1 allow for the identification of cross-cutting patterns that articulate the broader landscape of artificial intelligence integration within Ecuadorian education, across face-to-face, virtual, and distance modalities. A first noteworthy element is the concentration of studies at the level of higher education, reflecting a national research trend focused predominantly on university contexts. In this regard, the sole case corresponding to basic education presented by Encarnación-Maldonado and Saa-Zamora (2025) is particularly significant, as it demonstrates that the benefits of AI in early educational stages are not uniformly distributed, but rather vary according to students' prior technological and educational capital.

With respect to the tools employed, a progressive diversification can be observed, ranging from automated feedback platforms in basic education to adaptive intelligent tutoring systems and technology acceptance models applied in higher education. This instrumental diversity does not merely reflect differences in educational level, but also corresponds to the distinct teaching modalities involved. Online and distance modalities tend to incorporate tools of greater algorithmic complexity, such as the personalised tutoring systems documented by López-Michelini (2024), whereas face-to-face and hybrid contexts show a

higher prevalence of generative AI used for textual production and document retrieval, as reported by Gómez-Mendoza and Arroyo-Gutiérrez (2024).

With regard to the principal findings, Table 1 reveals a structural tension that permeates all the cases analysed: verifiable academic benefits—such as reduced dropout rates, improved reading comprehension, and enhanced mathematical performance coexist with pedagogical risks of varying nature. In this respect, Espinoza-Bravo et al. (2025) identify the gender gap as a dimension of inequality that constrains equitable access to and use of available tools, while López-Michelini (2024) warns of AI-mediated surface learning as an unintended consequence of technological dependence. Likewise, Gómez-Mendoza and Arroyo-Gutiérrez (2024) document the erosion of traditional mechanisms for assessing genuine competencies. This convergence of risks suggests that the adoption of AI within Ecuadorian educational systems requires coherent regulatory and pedagogical frameworks to accompany technological deployment.

With the largest sample scope in the dataset, the study by Noblecilla-Quintana and Raymond-Cornejo (2025) provides a key benchmark for contextualising the series: the reported 73.4% usage of generative AI tools among online university students indicates that integration is no longer an emerging phenomenon, but rather a consolidated practice. Nevertheless, its concentration in urban areas reveals that such consolidation is geographically uneven, directly challenging digital equity policies within Ecuadorian higher education institutions.

Impact variables identified in the meta-analysis

The cross-sectional analysis of the seventeen studies enabled the identification of five recurrent impact variables within the literature. The first is personalisation of learning, reported as the most consistent benefit of AI in distance education environments according to Granda-Dávila et al. (2024) and Leal-Cevallos et al. (2025). Adaptive systems adjust difficulty, pace, and learning resources based on individual performance, which is particularly valuable in contexts characterised by high student heterogeneity.

The second variable is teaching efficiency, referring to the capacity of AI to reduce the administrative workload of academic staff, automate the grading of routine tasks, and generate progress-tracking reports, as documented by Modesto-Acosta et al. (2025). Such efficiency enables educators to reallocate time towards higher-value pedagogical activities, including personalised tutoring and high-quality formative feedback.

The third variable is the development of digital competences, understood as the set of skills required to interact effectively and critically with AI systems in academic contexts, as outlined by Aparicio-Flores et al. (2025). The reviewed studies suggest that the use of AI tools when accompanied by explicit pedagogical guidance supports the development of critical thinking, information curation, and digital communication skills.

The fourth variable is academic integrity, which emerges as one of the most frequently cited challenges in the literature, as highlighted by Castillo-Salazar and Mora-Rosales (2024) and Farinango et al. (2026). The ease with which generative AI systems can produce academically credible texts has raised concerns within Ecuadorian educational communities, necessitating a redefinition of assessment criteria and the development of mechanisms to detect undeclared AI-assisted production.

The fifth variable is equity of access, which cuts across all the studies analysed, as evidenced by Velásquez-Albarracín et al. (2025) and Taipicaña-Vergara et al. (2024). The unequal distribution of connectivity, devices, and digital competences across Ecuador determines that the benefits of AI in distance education are not evenly distributed, but instead tend to concentrate among populations with greater technological and cultural capital.

DISCUSSION

A comparison between the revised theoretical framework and the results of the meta-analysis allows us to identify points of convergence, tensions and gaps that shed greater light on the phenomenon under study; in that order, the data

obtained confirm the central thesis put forward by Leal-Cevallos et al. (2025) regarding the transformative capacity of generative artificial intelligence (AI) in contemporary Ecuadorian pedagogy, as the emblematic cases analysed show that this technology has begun to substantially alter the ways in which teachers and students engage with knowledge in distance learning environments.

The connectivist perspective finds empirical support in the work of Espinoza-Bravo et al. (2025) and Lopez-Michelini (2024), who document concrete improvements in learning when adaptive systems operate in environments with stable connectivity and with students possessing prior digital skills; in contrast, González-Criollo and Granda-Cruz (2025) note that the application of these tools in Ecuadorian distance education contexts faces structural limitations that prevent these benefits from being generalised across the entire education system.

In line with the above, the AIDUA model proposed by Espinoza-Bravo et al. (2025) extends and contextualises the classic TAM model by incorporating specific dimensions of the Latin American context, such as trust in data privacy and the influence of digital social capital; this contribution is theoretically valuable for understanding why the adoption of AI in Ecuadorian online learning does not follow the linear patterns predicted by Anglo-Saxon models of technology diffusion.

In the same vein, Castillo-Salazar and Mora-Rosales (2024) point out that failures in the integration of AI often stem not from the limitations of the technology itself, but from the absence of pedagogical frameworks to guide its use with educational intent; this observation is corroborated by the findings of Gómez-Mendoza and Arroyo-Gutiérrez (2024) in the field of legal studies, where the instrumental and unmediated use of AI has generated academic practices that undermine the development of argumentative and analytical skills, which form the core of the legal professional’s profile.

Similarly, the warning issued by Padilla-Caballero et al. (2023) regarding the need to develop critical research skills in the face of AI takes on particular relevance in light of the meta-analysis's findings, as Ecuadorian academic output documents a predominantly instrumental use of these tools by students, geared towards obtaining immediate answers rather than developing rigorous thought processes; this trend represents a long-term pedagogical risk that Ecuadorian distance learning institutions must address urgently.

Against this backdrop, the work of Modesto-Acosta et al. (2025) on the pedagogical benefits of AI in contemporary education offers a necessary counterpoint to the predominantly critical perspectives, as its authors document situations in which this technology has helped to democratise access to quality tutoring, narrow the gaps between students with different levels of prior preparation, and provide timely feedback in settings where teacher-student interaction is structurally limited by the inherent conditions of distance learning.

Notwithstanding the above, the issue of educational equity constitutes the main point of contention in the analysed literature, as both Velásquez-Albarracín et al. (2025) and Taipicaña-Vergara et al. (2024) agree that the country's technological infrastructure is neither uniform nor sufficient to ensure that the integration of AI takes place under equitable conditions; complementarily, Pérez-Campdesuñer et al. (2025), although focused on the business sector, identify barriers to technology adoption analogous to those faced by Ecuadorian educational institutions, suggesting that the problem of the digital divide transcends the strictly school-based sphere and responds to broader structural dynamics.

In terms of academic integrity, Farinango et al. (2026) and Castillo-Salazar and Mora-Rosales (2024) agree that generative AI has intensified a pre-existing debate on valid forms of knowledge production in the university context; this debate directly challenges Ecuadorian distance learning institutions, which face greater difficulties in verifying the authorship of student work in environments mediated exclusively by technology.

From another angle, Aparicio-Flores et al. (2025) offer a perspective on human-computer interaction that enriches the analysis by linking students' perfectionist profiles with their digital skills for online interaction; their data indicate that students with dysfunctional perfectionist tendencies experience higher levels of technology anxiety, which in turn reduces their willingness to explore AI tools in virtual learning environments, meaning that this psycho-pedagogical variable constitutes a rarely explored angle of analysis in Ecuadorian studies on the subject.

From a global perspective, Nuong-Deri et al. (2024) emphasise that the incorporation of AI into higher education institutions requires careful governance that articulates coherent usage policies, ethical frameworks, training programmes and assessment systems; this recommendation is particularly relevant to the Ecuadorian context, where the adoption of AI has progressed more rapidly than the institutional capacity to regulate and guide it pedagogically; In line with this, Granda-Dávila et al. (2024) point out that the benefits of AI in the teaching-learning process are contingent upon the degree of pedagogical appropriation that teachers and students develop in relation to these technologies.

CONCLUSION

An analysis of the impact of artificial intelligence on distance learning in Ecuador reveals a dual scenario in which verifiable pedagogical benefits including personalised learning, reduced dropout rates and improved academic performance coexist with risks of various kinds that cannot be ignored; systematic evidence drawn from seventeen studies covering the period 2023–2026 demonstrates that such benefits are not distributed evenly across the country, but are concentrated primarily in institutions with greater technological capacity and among students with prior digital literacy, making equity of access the most contentious aspect of the phenomenon under study.

Added to this are threats to academic integrity, the risk of technology-mediated superficial learning, and the absence of pedagogical and institutional frameworks to guide the use of AI with educational intent; taken together, these conditions

paint a picture in which technological adoption has advanced at a pace that exceeds the education system's capacity to regulate, guide and distribute it fairly. In view of the above, it can be concluded that the impact of artificial intelligence on distance learning in Ecuador is real and growing; however, its full and equitable realisation remains constrained by structural factors relating to infrastructure, teacher training and governance that the national education system has not yet adequately addressed; for this reason, the institutions involved are called upon to develop public policy and pedagogical management responses that are equal to the challenge posed by this technology.

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REFERENCES

Aparicio-Flores, M. P., Vicent, M., López López, M. de L., & García-Fernández, J. M. (2025). Profiles of perfectionistic automatic thoughts and digital skills for online interaction. *International Journal of Human–Computer Interaction, 41*(23), 15158–15168. https://doi.org/10.1080/10447318.2025.2495116

Castillo-Salazar, D. R., & Mora-Rosales, J. C. (2024). La inteligencia artificial en la educación superior: aciertos y desaciertos. Una revisión sistemática [Artificial intelligence in higher education: successes and failures. A systematic review]. *KIRIA: Revista Científica Multidisciplinaria, 2*(4), 9–18. https://doi.org/10.53877/0hxk1v43

Encarnación-Maldonado, S. M., & Saa-Zamora, M. de J. (2025). Estudio de caso: impacto del uso de inteligencia artificial en el proceso de enseñanza-aprendizaje en la Unidad Educativa Coronel Emilio Suárez [Case study: impact of the use of artificial intelligence in the teaching-learning process at Coronel Emilio Suárez Educational Unit]. *DISCE. Revista Científica Educativa y Social, 2*(1), 216–230. https://doi.org/10.69821/DISCE.v2i1.46

Espinoza-Bravo, M. G., Cabezas-Cabezas, R., Perez-Cepeda, M., Carvache-Franco, O., & Carvache-Franco, W. (2025). AIDUA (artificial intelligence device use and acceptance) model to assess the acceptance of AI in the

learning practices of higher education students. *Cogent Education, 12*(1). https://doi.org/10.1080/2331186X.2025.2560618

Farinango, F., Rivera, M., Gualsaqui, D., Narváez, F., & Guerra, D. (2026). Impacto educativo de la inteligencia artificial generativa: una revisión crítica de avances, desafíos y perspectivas [Educational impact of generative artificial intelligence: a critical review of advances, challenges, and perspectives]. *Revista Ecos de la Academia, 12*(23), e1347. https://doi.org/10.53358/ezehzt04

Gómez-Mendoza, M. J., & Arroyo-Gutiérrez, A. J. (2024). El impacto de la inteligencia artificial en la educación ecuatoriana [The impact of artificial intelligence in Ecuadorian education]. *Revista Científica Hallazgos21, 9*(2), 201–207. https://doi.org/10.69890/hallazgos21.v9i2.663

González-Criollo, M. J., & Granda-Cruz, C. A. (2025). Inteligencia artificial en las prácticas educativas en la educación a distancia y en línea [Artificial intelligence in educational practices in distance and online education]. *Runae, (13)*, 4–15. https://doi.org/10.70141/runae.13.1207

Granda-Dávila, M. F., Muncha-Cofre, I. J., Guamanquispe-Rosero, F. V., & Jácome-Noroña, J. H. (2024). Artificial intelligence: advantages and disadvantages of its use in the teaching-learning process. *MENTOR Revista de Investigación Educativa y Deportiva, 3*(7), 202–224. https://doi.org/10.56200/mried.v3i7.7081

Leal-Cevallos, J. H., Ramírez-Álava, L. C., Loor-Burgos, E. del R., & Álava-Cevallos, C. del R. (2025). Inteligencia artificial generativa en educación ecuatoriana: transformación pedagógica y desarrollo cognitivo [Generative artificial intelligence in Ecuadorian education: pedagogical transformation and cognitive development]. *Cognopolis. Revista de Educación y Pedagogía, 3*(3), 94–121. https://doi.org/10.62574/r06dpy41

Lopez-Michelini, O. (2024). Influencia de la inteligencia artificial en el aprendizaje de las matemáticas en la educación superior [Influence of artificial intelligence on mathematics learning in higher education]. *CIENCIAMATRIA, 10*(2), 717–734. https://doi.org/10.35381/cm.v10i2.1406

Modesto-Acosta, C., Gil-Gamboa, K. de los A., & Rosado-Espinoza, J. D. (2025). El papel de la inteligencia artificial en la educación contemporánea: análisis de sus aplicaciones y beneficios pedagógicos [The role of artificial intelligence in contemporary education: analysis of its applications and pedagogical benefits]. *Multidisciplinary Journal of Sciences, Discoveries, and Society, 2*(4), 1–13. https://doi.org/10.71068/bkhndn04

Noblecilla-Quintana, G. E., & Raymond-Cornejo, F. E. (2025). Implementación de la inteligencia artificial por estudiantes de pregrado en Ecuador: modalidad en línea [Implementation of artificial intelligence by undergraduate students in Ecuador: online modality]. *Ciencia Latina*

Revista Científica Multidisciplinar, 9(2), 6410–6439. https://doi.org/10.37811/cl_rcm.v9i2.17373

Nuong-Deri, M., Singh, A., Zaazie, P., & Anandene, D. (2024). Leveraging artificial intelligence in higher educational institutions: a comprehensive overview. *Revista de Educación y Derecho, (30)*. https://doi.org/10.1344/REYD2024.30.45777

Padilla-Caballero, J. E. A., Naupay-Gusukuma, Á. M., Ruiz-Salazar, J. M., & Poma-Garcia, C. R. (2023). Habilidades investigativas universitarias del futuro: el papel de la inteligencia artificial [Future university research skills: the role of artificial intelligence]. *Revista Arbitrada Interdisciplinaria Koinonía, 8*(2), 702–722. https://doi.org/10.35381/r.k.v8i2.2946

Pérez-Campdesuñer, R., Sánchez-Rodríguez, A., García-Vidal, G., Martínez-Vivar, R., & De Miguel-Guzmán, M. (2025). Artificial intelligence in Ecuadorian SMEs: drivers and obstacles to adoption. *Information, 16*(6), 443. https://doi.org/10.3390/info16060443

Taipicaña-Vergara, J. A., Hidalgo-Achig, M. F., Sinchiguano-Molina, G., Salguero-Núñez, C. S., & Chiguano-Umajinga, N. R. (2024). Factors impacting the integration of AI in Ecuadorian higher education: perspectives and implications. *Sapienza: International Journal of Interdisciplinary Studies, 5*(4), e24075. https://doi.org/10.51798/sijis.v5i4.868

Velásquez-Albarracín, V. P., Lucio-Ramos, Y. J., Picón-Nieto, A. F., & Analuisa-García, P. S. (2025). Challenges and opportunities of integrating artificial intelligence into basic education in Ecuador [Desafíos y oportunidades de la integración de la inteligencia artificial en la educación básica ecuatoriana]. *Cognopolis. Revista de Educación y Pedagogía, 3*(2), 1–13. https://doi.org/10.62574/merbgs03

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